CHAPTER 5: INFORMATION AUDIT METHODOLOGIES

Chapter 5: Overview

The purpose of this study is to investigate the concept and process of information auditing by investigating different information auditing methodologies discussed in the literature. It is not intended to be a definitive or exhaustive study but, rather, a contribution to the debate on information auditing techniques.

1. Introduction

An increased interest in information management has led to an increased interest in the use of information audits (Ellis et al, 1993:134). As example of this interest, the SLA produced an information audit kit – as it is a topic that is important to information professionals (Hall, 1996:iv).

From the literature studied by the researcher it becomes clear that many authors do not regard a project as an information audit if it does not, at some or other stage, calculate the cost and determine the value of information resources. According to some information audit methodologies, the process is limited to identifying information needs, identifying information resources and determining how well the information resources meet the identified information needs.

2. Different approaches to information auditing

The researcher found discussions of a variety of different approaches to information auditing in the literature. For example: Ellis et al (1993:134) categorise information audit methodologies as follows:

- Cost-benefit methodologies
- Geographical methodologies
- Hybrid methodologies
- Management information audits
- Operational advisory methodologies

2.1 Cost-benefit methodologies

"The objective of a cost-benefit analysis is a list op options compared to each other on the basis of their cost and perceived benefit" (Ellis et al, 1993:135).

2.2 Geographical methodologies

The term *geographical approach* reminds the researcher of the process of Infomapping, as developed by Burk & Horton (1988) whereby the identified information resources are presented graphically by plotting them on an information map (infomap). From the description of this approach given by Ellis et al (1993:136), 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".

2.3 Hybrid methodologies

The information audits that are based on the hybrid approach, typically combines elements from more than one of the other approaches listed here. The example identified by Ellis et al (1993:136) is the methodology as developed by Quinn (1979:18-19). This methodology 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.

2.4   Management information methodologies

Booth & Haines (1993:231) describe the information audit as part of "a relatively new discipline, but one that builds upon established techniques from information science". In contrast to this, Ellis et al (1993:137) identify interest from role players in other fields, e.g. role players in the auditing, management consultancy and accounting professions. Although "[t]his has been mainly in the audit of management information systems (MIS)", there is "potential for broader application".

2.5   Operational advisory methodologies

Ellis et al (1993:138) define the scope of a typical operational advisory audit in terms of what the objectives should be:

- 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.
- To ensure compliance with obligations, regulations and standards.

2.6   Compliance, advisory and inventory-oriented audits

Two possible approaches to information auditing are suggested by Haynes (1995:30), i.e.:

- a compliance-based approach similar to the approaches used by financial auditors (where the compliance of the organisation with financial procedures, standards and laws are evaluated);
- an inventory-oriented approach identifying and listing organisational information assets/resources.

A similar perspective is offered by Ellis et al (1993:134) who point out that there are two main types of auditing, i.e. compliance and advisory audits.

- The compliance audit is concerned with financial systems. It is an example of the traditional, financial audit that was conducted to investigate whether procedures were being followed and that legal and fiscal standards were being adhered to.
- In contrast, the advisory audit is concerned with strategic planning. The function of the advisory audit is to inform (potential) users of existing information systems and products. Furthermore the purpose of the advisory audit is to evaluate the effectiveness of organisational information systems in terms of how these contribute to attaining organisational goals.

The majority of information audits are of an advisory nature, though elements of the compliance audit may be found in some methodologies.

3. Methodologies

The researcher will provide an overview of different discussions on information auditing that were found in the literature. Each of these methodologies will be categorised according to the classification scheme proposed by Ellis et al (paragraphs 2.1 to 2.5). The researcher will conclude the discussion of individual methodologies with critical comments as to the usefulness and strong and weak points of each.

3.1 Barker

Barker (1990:27-34) bases the information audit methodology (1990:27-34) on work by Chambers, Diamand and Taylor. Barker's methodology consists of 10 stages.

Phase 1: Define the organisational environment

Identify the major goals of the organisation and determine what constraints affect the organisational information systems.

Phase 2: Identify the users' information needs

Barker (1990:28) regards this as the most crucial stage of the audit as this information must be used to determine whether the users are receiving relevant information from the organisational information systems, i.e. information that they need to perform their tasks and in so doing, obtain the organisational objectives and goals.

Phase 3: Compile an inventory of the available information resources

The inventory should not be limited to formal information systems, but should focus on the organisational information environment as a whole. The purpose of this stage is to determine whether resources are used efficiently (Barker, 1990:29-30).

Phase 4: Identify the strong and weak points of the information system(s)

Use the information that was gathered during the first three stages to develop an overview of the strong and weak points of the organisational information systems and resources. Key control points should also be identified (Barker, 1990:30-31).

Phase 5: Evaluate the weak points of the system

Identify the deep-seated reasons for system failures and determine the effect of these on organisational performance (Barker, 1990:31-32).

Phase 6: Test the key control points of the system

Barker (1990:32) states that the key control points of the system should be tested, whether or not system failures were identified.

Phase 7: Generate alternative solutions for system failures

Generate alternative methods for solving the system problems that have been identified. Input from management and staff can be invited. According to Barker (1990:32) this specific stage does not necessarily form part of an operational information audit, but is not it excluded by the definition of the audit either. Barker includes this stage in order to prevent the suggestion of only vague improvements. Real solutions to identified problems should be offered.

Phase 8: Evaluate the alternatives generated during phase 7

Make recommendations for changes – if necessary.

Phase 9: Monitor that the system adheres to existing standards and regulations

The researcher identifies this stage as being based on the principles of the compliance (financial) audit.

Phase 10: Make recommendations

In accordance with the audit findings a detailed report must be compiled. According to Barker (1990:33) "[t]he final audit report should be a full documentation of recommendations, reasons for them and supporting evidence from tests, etc." This is important because management needs to have accurate, complete information from which to make and implement decisions. The information in the report may also prove useful as a platform for performing future audits.

Comments by researcher

According to the researcher this methodology can be classified as an operational advisory audit for the following reasons:

- It is determined whether the purpose of the information system is in congruence with the purpose and philosophy of the organisation;
- The efficiency and effectiveness with which the information system is used, are determined;
- The usefulness and reliability of the information system is tested;
- The information system is monitored to determine adherence to regulations and standards.

An element of compliance forms part of the methodology – phase 9, where adherence to standards and regulations are determined. A possible limitation of Barker's methodology is the lack of a phase during which the cost and value of information resources are determined.

3.2   Hamilton

Hamilton (1993) discusses the process of information auditing extensively. Practical examples of how to go about implementing the various phases of the process are included for those organizations who would prefer to perform the audit themselves. These examples are taken from a case study of an actual information audit that was performed in an organisation.

Hamilton's methodology for performing an information audit, entails the following:

Phase 1: The proposal

The success of an information audit depends on preparing and submitting a good proposal. The proposal can be used to convince management of the importance of performing an information audit. Once the proposal has been approved, it can be used as a guideline for performing the actual audit (Hamilton, 1993:79).

Hamilton (1993:79) suggests that one should follow the in-house style (if there is a prescribed one) when drafting the proposal. The proposal should contain most of the following elements:

- Title of proposal: include the word *proposal*, to distinguish it from the final report.
- Introduction: give background information on the reason for wanting to perform an information audit and a brief overview of what it will entail.
- Methodology: describe the method that will be followed, listing it item by item.
- Staffing: indicate the number of people who will be involved in the audit and what they will be doing.
- Timescale: include due dates for each of the phases described in the methodology. Allow ample time for each of the phases (i.e. leave time for things to go wrong).
- Costs: include a budget, indicating costs that will be incurred, e.g. external consultancy fees (Hamilton, 1993:79-80).

Hamilton (1993:80) stresses the importance of allowing extra time and also budgeting generously, as it creates a much better impression if the audit is finished earlier and within budget than when the auditor "overshoot[s] in both areas."

Proofread the proposal and present it in a professional manner, i.e. typed, with wide margins, in double spacing and with headings in bold and uppercase (Hamilton, 1993:80).

Phase 2: Preparation for performing the information audit

Before one starts collecting data, all the needed equipment/instruments should be in place, e.g.:

- properly designed questionnaires;
- staff who have the skills to conduct interviews and/or analyse questionnaire results;

71

- record formats for each of the databases that will be used for storing the collected data;
- support staff from both the functions of information management and information technology (Hamilton, 1993:80).

Depending on time and financial constraints, a choice should be made whether to use external consultants or staff members. There are various advantages and disadvantages to using either of these groups, but a final decision should be made with a view to the specific circumstances within the organisation (Hamilton, 1993:80-81).

o Questionnaires

Questionnaires should be kept as short as possible. For the actual information audit that was performed, only one questionnaire was designed. This questionnaire served a dual purpose as it was sent out and also used during the interviews (Hamilton, 1993:81).

It is a good idea to use a structured questionnaire for interview purposes. This ensures that all interviews yield the same information. The headings can be used as guidelines to questions that must be asked (Hamilton, 1993:81).

A disadvantage to using questionnaires is the poor response rate, especially when these are sent out and respondents are responsible for returning the completed questionnaires. Research has proven that no more than a 10% response rate should be expected when sending questionnaires via mail. Such a poor response rate would render results useless when performing an information audit. For an information audit a response rate of at least 95% is desirable. Attaching an explanatory memo to individual questionnaires might help to improve the response rate (Hamilton, 1993:81).

For the audit that was performed by Hamilton (1993:81) a questionnaire was designed for the purpose of identifying the information resources that were used in the organisation. A need for a second questionnaire was identified and one was designed in order to determine the use of technological equipment in the organisation. The response rate to this questionnaire was 100%, as the questionnaire consisted of Yes/No responses with only the last question needing a written comment (Hamilton, 1993:81-84).

o Selecting interviewees

It is of the utmost importance to select interviewees so as to be representative of the staff composition of the organization. This will enable the auditor "to gain a full picture of the information resources in [the] organization." The telephone directory of the organization can be used to assist with choosing interviewees. Alternatively a staff list can be used. It is important to use a source that has information on the functions of staff members and the departments in which they work. Try and avoid interviewing staff who perform the same functions. It is furthermore important to obtain the names of the Heads of Departments, as they need to be informed of interviews that will be conducted with their subordinates (Hamilton, 1993:84-85).

Appointments must be made with all interviewees. Phone them individually and give each a brief explanation of the reason for the interview, explaining that it will not take up a lot of their time (Hamilton, 1993:84).

Phase 3: Conducting the interviews

Hamilton (1993:85) suggests asking questions in a conversational manner, rather than asking narrowly focused questions which result in narrowly focused answers, e.g. instead of asking whether IBM PCs are used, ask what type of PCs are used. This interview style will result in the interviewer being exposed to a lot information, some of which may be irrelevant. The interviewer needs to concentrate and judge what to include in the final results (Hamilton, 1993:85).

In the same manner, staff can be encouraged to talk about their jobs, the functions they perform and the information they use in support of this. An interview situation that encourages to the interviewee to talk freely, may yield very useful information and suggestions, e.g. suggestions of key staff members who should also be interviewed. The auditor can use this information to amend the list of potential interviewees (Hamilton, 1993:86).

Phase 4: Setting up databases

All the information that is collected during the auditing process, must be loaded onto a database. It seems senseless not to save all the information that has been collected. Loading the information on the information resources onto a database has the added advantage that this information can be made accessible to all the staff. In cases where a database management system (DBMS) is being used in the organisation, the auditor should try and use this same system, as it will need a minimum amount of training, if any, and staff will already be familiar with using the system (Hamilton, 1993:86).

Despite careful planning during the initial phase of the audit, it may be necessary to adapt the original record structure by adding or deleting some fields. Field names must be chosen carefully and if possible, should relate to the headings used in the questionnaires. If necessary, different security levels should be built into the database structure, e.g. available to anyone; available to all staff; available to a specific department only; available only to the interviewee. During the interviews, mention can be made of security measures. This should encourage interviewees to talk openly about all information sources (Hamilton, 1993:87).

Phase 5: Keying in data

Information from completed questionnaires/interviews should be keyed in regularly and Hamilton (1993:89) suggests that one should do this at least once every three days, or even more often, if possible. Interviewers will suffer from information overload and keying in the information regularly will help them remember more than if time is allowed to pass, especially if they did not write everything down because they "[will] remember it".

When scheduling the interviews, time should also be scheduled for keying in the results of these. It is preferable that the interviewer key in the data from the interview sheet (Hamilton, 1993:90).

Consistency can be ensured by keeping some type of "authority file", e.g. to indicate preferred forms of entry. Such an authority file will prove invaluable later on, when it can be used as a searching aid by users of the database (Hamilton, 1993:90).

In instances where a hard copy of the database is required, it is a good idea to do a test run print-out when there are only a few records entered. Adjustments can be made if necessary at a relatively early stage (Hamilton, 1993:90).

Phase 6: The cost of information

Many authors, including Hamilton (1993:91), regard the valuing of information as the most difficult part of an information audit. Factors that complicate the calculation of actual costs include amongst others: costs that are passed on to clients/departments; costs that are incurred that are not usually charged for, e.g. online search costs, telecommunications costs; costs to which built-in profit margins are added; the fact that costs are not limited to resources in the library/information centre but must be calculated for all the information sources in the organization (Hamilton, 1993:91-92).

In view of the complexities of calculating the actual costs of information sources, Hamilton (1993:92) suggests a compromise, i.e. "that the costing of information use throughout the organization will have to be based on what information is available, plus a best guess (an estimate)." A session with the organizational accountant can be useful, but as there are currently no accounting standards that can be applied to information resources, an estimate will have to do.

Phase 7: The value of information resources

The issue of how to determine the value of information resources is a controversial one. Much has been written about this, cf. the overview given in Chapter 4.

As is the case with calculating the costs of information, the problem of a lack of standards applies to valuing of information sources as well. According to Hamilton (1993:92-93) it comes down to the fact that "it is simply not possible to put a monetary value on anything – unless it is a service for which a charge is made."

The researcher will not go into detail as far as the problems of determining the value of information resources are concerned. This is an issue that can be addressed in another research project.

Phase 8: The final report

After all the phases discussed above have been completed, the information can be analysed and a final report can be compiled. The results of the information audit should yield information on patterns of information flow in the organisation; highlight areas where duplication takes place; and identify gaps in information provision (Hamilton, 1993:93).

The final report should include some or all of the following sections (not necessarily in this order):

- Introduction
- A summary of main points
- Brief explanation of what an information audit is and what the process entails
- Information on the identified organizational information resources and how these are used
- Cost and value of information resources
- Examples of questionnaire forms
- A list of people interviewed
- A copy of the original proposal (Hamilton, 1993:94).

The major part of the report should be made up of details of the identified organizational information resources. This section should be divided into subsections. Hamilton (1993:94) states that if the database was designed properly, a hard copy print-out can be made of the records with information on the identified information resources and this can then be included in the report.

The section on the cost and value of information resources need to be supported by an explanation of the complexities involved in doing the actual calculations and determining real value. The lack of (accounting) standards should also be pointed out (Hamilton, 1993:94-95).

A section can be devoted to discussing gaps in information provision that were identified, as well as other problems, such as duplication. A few recommendations can be made, but not too many, because "strictly speaking, an audit is simply an accounting function and not an opportunity to comment" (Hamilton, 1993:95). The researcher has determined that this statement of Hamilton is inaccurate, as it has been determined that one of the four main phases that make up an audit, is the phase during which reporting is done (cf. discussion in Chapter 2). Credit has to be given to Hamilton (1993:95) as she also points out that "since one point of carrying out an information audit is to see where improvements might be made, it would be foolish to simply list everything without comment."

Phase 9: Presenting the report

The auditor should get an opportunity to present the final report, at which time more detailed explanations of specific aspects can be given. It furthermore provides the auditor with an opportunity to acknowledge those staff members who have shown interest as well as those who participated and offered help. The presentation should preferably be limited to no shorter than 30 minutes and no longer than an hour and a half, depending on the specific situation in which the presentation is to be made. (Hamilton, 1993:96). These statements of Hamilton are in line with the findings of the researcher after investigating the characteristics of financial audits. According to the latter, an audit is performed with the purpose of "...expressing an opinion thereon...". Furthermore one of the stages that make up an audit is the phase during which evaluating, concluding and reporting takes place (The principles and practice of auditing, 1992:44,56).

Comments by the researcher

The researcher finds it difficult to classify the approach as described by Hamilton, as this approach does not fit perfectly into any of the categories as identified by Ellis et al (see the discussion at the beginning of this chapter). The reasons for this are that even though the costs and value of the identified information resources are calculated and determined, this is not done as a cost-benefit analysis. The approach as described by Hamilton could be classified as an example of the hybrid approach as it contains elements of the cost-benefit approach and elements of the operational advisory audit.

As a point of critique, Hamilton's methodology does not make provision for the definition of the organisational environment, e.g. the specific identification of organisational objectives, nor are these related to the use of organisational information resources. On the positive side, Hamilton's methodology focuses on the identification of information technology resources and only in instances where these are used as tools for handling/managing information resources (i.e. not technology for the sake of it being technology). The methodology as described by Hamilton contains many practical suggestions.

3.3   Alderson

Information auditing principles are integrated with accounting principles in the methodology discussed in this article. 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 (1993:2) the corporate library managed the information audit.

Phase 1: 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. Questions that could be asked, include, amongst others:

- What services are used?
- How frequently these are used?
- Which departments use these services?
- For what purposes are these services used? (Alderson, 1993:2).

Phase 2: Valuing information resources

Alderson (1993:74-78) 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, e.g.:

- Actual cost-savings can be calculated (e.g. when accessing a database through one vendor as opposed to a more expensive one);.
- The actual costs of online searches can be calculated.
- King Research conducted a study in which they calculated the return on investment to the organisation (by comparing information access costs to established goals which are satisfied) (Alderson, 1993:4).
- o Results of the information audit

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, 1993:2).

Comments by the researcher

The researcher finds it difficult to comment on this information audit, as the full methodology is not discussed. The researcher finds the comments on calculating the value of information resources useful. It is a pity that the specific methods are not discussed in any detail. According to the classification of information audit types by Ellis et al (1993:135) the researcher identifies Alderson's methodology as a cost-benefit approach.

3.4   De Vaal & Du Toit

De Vaal & Du Toit (1995:122-128) performed an information audit in an insurance company. The company experienced problems with records management and the information audit was used to identify the problems in managing the records of the company, the problems with information flow because of poor records management, and eventually to make suggestions towards the solving of these problems.

De Vaal & Du Toit (1995:123-124) base their information audit on Burk & Horton's Infomapping methodology. As discussed in Chapter 3, Infomapping consists of four main phases, i.e.:

* Compilation of a preliminary inventory
* Costing and valuing information
* Analysing the inventory, costs and values
* Identification of strong and weak points.

o   Application of the methodology to insurance company ABC

Firstly, De Vaal & Du Toit (1995:124) point out a limitation in the methodology as developed by Burk & Horton, i.e. that it does not provide guidelines for determining patterns of information flow in an organisation. Initially the methodology was applied to only one department of the insurance company. An information inventory was compiled. The value and costs of the identified information resources, were not calculated. The phases that were performed (phases 1 and 4), were chosen based on the specific environment and taking into account the time and financial constraints. Burk & Horton indicate that it is not necessary to perform all the phases of their methodology in order to obtain useful results (De Vaal & Du Toit, 1995:124).

Top management recognised the value of business records for the effective functioning of the company and therefore it was not really necessary to convince them of the necessity of performing an information audit (De Vaal & Du Toit, 1995:124).

The job description of the administrative officer responsible for managing the records department was analysed. A new information inventory was compiled as no previous inventories existed and existing information that could have been useful, was outdated.[1] Following on this, the identified information records were classified according to a system proposed by Burk & Horton, i.e. as information sources, information services and information systems. Forms were designed to assist the auditor in collecting information on the records (De Vaal & Du Toit, 1995:124,125).

o   Information collection and evaluation

All the identified information sources, systems and services were listed, but not prioritised. The pattern(s) of information flow in the organisation were identified through an interview with the postal clerk. The findings were presented in diagrammatical (visual) format. Problems in terms of information flow were also identified (De Vaal & Du Toit, 1995:125-127).

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[1] According to Burk & Horton, the compilation of an information inventory ought to be an integral part of the strategic planning of an organisation.

o   Conclusions and recommendations

The insurance company did not manage information as a resource and to its competitive advantage. De Vaal & Du Toit (1995:127) suggest that a corporate information audit be performed. Further recommendations include the following:

- The appointment of a qualified staff member in the position of records manager;.

- The formulation and implementation of a corporate information policy (that should also address records management issues).

- The compilation of manuals with guidelines for the management of records.

- The development of a thesaurus to be used when indexing records.

- The implementation of measures to monitor the flow of records in the organisation.

- An investigation into alternative methods for storing records (De Vaal & Du Toit, 1995:127).

It is also emphasised that an information audit must not only be conducted once, but that it should be an ongoing process (De Vaal, 1995:122).

The results (benefits) of the audit can be summarised as follows:

- Top management realised that proper records management could be of value to the company (i.e. That proper records management will ensure that records are used to support decision making, planning, problem solving, as well as other tasks in the company).

- Top management realised that information is actually a strategic resource in the company, and should be managed as such.

- The information inventory can be used as a basis for implementing a records management strategy in the organisation (De Vaal & Du Toit, 1995:127).

Comments by the researcher

According to the researcher the process that was conducted does not qualify as a proper information audit as only phases 1 & 4 of the methodology as developed by Burk & Horton, was used. The technique that was used, is known as Infomapping and according to the researcher this term is not a synonym for information auditing (refer to the discussion in Chapter 3). This finding is verified by Posch (1992:63) who identifies one of the main uses of information maps as a *tool* during information auditing.

The researcher classifies the approach as developed by De Vaal & Du Toit (1995:122-128) as a geographical approach to information auditing. The reason for this is that the technique used, Burk & Horton's infomapping, emphasises the visual presentation of information resources. De Vaal & Du Toit (1995:1626-127) also do a visual (diagrammatical) presentation of their findings on the patterns of information flow in the company.

3.5   Dubois

Dubois (1995:20-24) proposes that an information audit be performed to help solve typical information(-related) problems experienced by organisations - or rather, to help to find possible answers. He proposes an information audit methodology that unfortunately, is not always discussed in sufficient detail.

In the United Kingdom, research has shown that the majority of managers use mainly internal (financial) information for decision making. The role of external information is ignored to a large extent. External information may include information on the activities of competitors and information on the economic, social and political environment in which an organisation functions. External information can therefore also be a valuable resource for managers responsible for decision making. Despite managers mainly using internal information for decision making purposes these information resources are often described and managed as "non-productive overheads" (Dubois, 1995:20).

Ironically, despite the picture painted of the information situation in companies, a significant financial contribution is made towards information resources and services. Unfortunately, these contributions are "often both substantial and disorganized." In situations of emergency external consultants are often hired to act as information scientists in order to obtain information for a specific project. It is difficult to determine whether the use of external consultants are the most cost-effective option, as few companies have the ability to identify and evaluate whether information is available internally and at what cost (Dubois, 1995:21).

Dubois (1995:21) regards information auditing as a potential solution to the information problems discussed above. An information audit can be performed at corporate level (preferably), but also in smaller units/departments within an organisation.

The role of the information audit becomes clearer when one looks at what is included in an information audit. This might include the following:

- "identifying resources, services and information flows;
- verifying the existence of appropriate services;
- rationalizing resources;
- controlling costs;
- improving the marketability of services by increased visibility;
- exploiting the resulting improvements." (Dubois, 1995:21).

Dubois (1995:21) breaks the information auditing process down into the following phases:

- Planning phase
- Survey (of resources, services, flows and needs)
- Blueprint of situation
- Report (with recommendations for action)
- Establishing regular monitoring mechanisms.

Each of these phases will now be discussed in more detail.

Phase 1: Planning

Proper and detailed planning will ensure the success of the information auditing process. Planning should include the following aspects:

- Define the objectives of the information audit and identify constraints.
- Use this information to obtain support from top management for the project. This support is especially important as this will ensure the availability of needed resources as well as establishing future communication channels.
- Obtain organisational charts. These are used as a starting point for "mapping communication flows" and identifying potential survey respondents.
- Define the survey methodology to be used and determine and identify the sample of respondents.
- Select the members of the audit team. This will depend on the size and nature of the organisation or subunit that must be audited, as well as the size of the survey sample. The audit team can be made up of staff members, external consultants or even a combination of members from both these groups. It is of the utmost importance that the members of the audit team understand the organisation dynamics and culture.
- Contact all survey respondents and inform them of their participation in the information audit. It is also important to explain the process to them (Dubois, 1995:21).

78

Phase 2: Survey

The sample of survey respondents should include staff from all levels and units within the organisation. Organisational charts and other relevant information sources can be used to ensure a representative selection of respondents. The method of information collection proposed by Dubois (1995:21) is a questionnaire, supplemented by interviews.

Types of information that should be gathered during the survey, include the following:

- General information about the work of the respondent and his department (this should include information on the "perceived role of the department" as well as information on internal, external and interdepartmental relationships);
- Priority should be given to critical success factors as identified by the respondents.[2]
- Identify information sources (internal and external) that are used;
- Identify information needs in terms of strategic objectives of the organisation;
- If it is relevant to the specific situation, hardware and software needs should also be identified (Dubois, 1995:21-22).

It is important to note that Dubois' survey methodology is designed to determine the role of information as a key resource in the organisation, rather than as a marginal extra.

Finally the collected information must be transferred to a database – it is preferable to use a database program that is already in use in the organisation. The database structure should be designed to simplify data analysis (Dubois, 1995:22).

Phase 3: Audit blueprint

The results of the survey are used to develop a blueprint in which the creation, identification, cost, use and communication of information is addressed (Dubois, 1995:22).

The blueprint will help identify, "in a fully costed manner", resources such as staff, services and materials and indicate their location in the organisation. This in turn helps the auditors to identify gaps, areas where duplication take place, overlaps, the under utilization of resources and technological problems. The blueprint can also be used to determine the financial cost of information use as well as the contribution of information sources and their usage to the effective functioning of the organisation. If the blueprint contains suitable information the advantages of information use in the organisation can be quantified (Dubois, 1995:22).

The blueprint can consist of charts, "resource listings, itemization of cost elements and descriptive analysis" (Dubois, 1995:22).[3]

The purpose of the blueprint is "[in] effect .... [to] reveal what actually happens and [to] show up corporate nerve centres and gatekeepers together with informal communication networks." (Dubois, 1995:22).

Phase 4: Report

The results of the survey must be presented in the form of a written report. The report will describe areas identified for rationalisation, areas where information needs are not being satisfied, and will also include proposals for improvements/possible solutions. (Dubois, 1995:22).

Whether this quantification is possible or not, the audit report can make the role of information resources and systems visible. This is very important as the report is presented to top management in the end. Areas where additional resources are needed should also be highlighted (Dubois, 1995:22).

According to Dubois (1995:22) "[the] visibility factor alone may be sufficient to justify the audit in terms of its contribution to general management."

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[2] Dubois (1995:22) prefers the identification of critical success factors in an organisation, rather than the identification of information needs at such an early stage of the survey.

[3] It is not clear what Dubois means by this, as no detailed explanation is given.

Phase 5: Monitoring mechanisms

The audit report (discussed above) should include proposals with respect to the implementation of mechanisms that can be used to monitor the data included in the blueprint, e.g. transactional databases. Such a mechanism has the advantage that a full-scale information audit need not be repeated in the near future, except if extensive organisational restructuring takes place or if there is a radical change in corporate objectives and strategies (Dubois, 1995:22).

Dubois (1995:22-24) follows the discussion of the methodology with a detailed discussion of a case study of an information audit performed in an information centre where the results of the information audit were used for developing a pricing strategy for the information centre.

Comments by the researcher

The researcher comes to the following conclusions, after studying the case study: The determination of organisational information needs as essential, as is the report *with recommendations for action*.[4] The format of the blueprint that was developed during the case study, is unclear. It is noted that it is very important to implement regular monitoring mechanisms, but what these would look like and how they should be managed, are still unclear. Other aspects that are unclear as they are not discussed in detail, include: the way in which costs were determined; and the method(s) used to determine the cost of information use. Proposals were made. It is important to note that communication flows were also identified and included in the audit.

As is the case with Hamilton's information audit methodology, the use of information technology is investigated as a tool to effective information management. Dubois' however, is not as practical discussion of the methodology that was used, as for example, the one by Hamilton (cf. paragraph 3.2).

In terms of classification, the researcher classifies this audit as an example of the operational advisory approach, for the following reasons. The audit is used:

- To determine whether the use of organisational information resources are in congruence with the purpose and philosophy of the organization;.

- 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 systems and resources supporting the organization are.

This method could have been classified as a cost-benefit approach if more emphasis had been placed on the cost-benefit component.

3.6   Eddison

The author briefly discusses information audit methodology.

Phase 1: Interviews

Identify employees who must be interviewed. Potential interviewees must be chosen from all the management levels in the organisation. Make appointments with the interviewees. Eddison (1992:8) suggests that an interview lasts approximately 30 minutes. If more time is needed this time can be asked for during these 30 minutes. In order to prepare the interviewees, a list of questions can be distributed to them beforehand with a request that they look it over before the interview. An aspect that is even more important than having the interviewee prepared, is for the auditor to prepare. He needs background information on the organisational culture, goals,

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[4] Own italicization – recommendations are not included as a component of all information audits, but the researcher regards it as essential.

objectives and functioning. This information will help him interpret the answers he gets during the interviews.

Eddison (1992:8-9) includes examples of the types of questions the auditor can ask during interviews.

Phase 2: Analyse information

Following the completion of the interviews the auditor must interpret the information that has been collected. St Clair (1995c) gives a detailed discussion of the way in which can interpret the statistical as well as impressionistic information. Eddison (1992:9) proposes a similar approach, e.g. she suggests that the results of the interviews be translated into increased requests for specific information services and products. This information can form the basis for the development of a strategic plan for the information centre.

Eddison (1992:9) also stresses the importance of follow-up audits. The purpose of such an audit is to determine whether the level of user satisfaction has increased, based on adaptations to the information centre, its information services and products.

Comments by the researcher

Eddison's is a limited application of information audit methodology, as the audit is performed within the organisational information centre and does not investigate the existence of other organisational information resources. This however, is acceptable as the scope of different information audits vary – as pointed out by Robertson (1994:34) who states that an audit can be limited in order to find a solution to a specific (operating) problem. The purpose of the audit as it was conducted in this case study, was to identify ways and means for improving the services rendered by the corporate information centre.

The researcher classifies this specific information audit as an operational advisory audit for the following reasons:

- The purpose of the audited system is defined and it is established how effectively it is being accomplished.

- It is established whether the purpose is in congruence with the purpose and philosophy of the organisation.

- The efficiency and effectiveness with which the resources are used, accounted for and safeguarded, are determined.

- It is determined how useful and reliable the information system is in supporting the organisation.

3.7   Gibson

Gibson (1996:12-13) discusses an information audit within the context of a library. He focuses on the basic elements of an information audit, popular misconceptions surrounding the process, and offers practical suggestions for performing an information audit.

Even though no standardised methodology exists, there are "recognised approaches to the audit process" (Gibson, 1996:12). As the basis to one such an approach, Gibson (1996:12-13) proposes the following three phases:

- Identify the users of information;
- Identify the technology used to handle information;
- Analyse the findings.

Each of these phases will consequently be discussed in more detail.

Phase 1: Identify the users of information

Once the user group has been clearly defined, it is relatively easy to determine whether the information service suits their needs. During this phase of the auditing process questions such as the following should be asked:

- Who uses information?
- What information do they use?
- What is the information used for (in terms of e.g. Task completion) - this in turn helps to determine the value of information
- What is the frequency of information use?
- How is the information stored, updated, retrieved and disseminated? (Gibson, 1996:12).

Phase 2: An investigation of the technology

Gibson (1996:12) reckons that an investigation of the technology used to handle organisational information, should form part of the audit process.[5] Questions pertaining to technology could include, amongst others:

- What "electrical" resources are used?
- Who has responsibility for purchasing the above?
- How reliable and appropriate are these resources?
- Are these resources compatible with other systems/technologies in the organisation?
- Who is responsible for the management of the technology? (Gibson, 1996:12)

Phase 3: Analyse the findings

Once the auditor has answers to the questions listed above, it is relatively easy to make comparisons and to draw distinctions. For example: it can be determined whether the resources that are used satisfy the requirements and the information needs of the users.

Comments by the researcher

Gibson's information audit methodology is similar in its approach to that described by Eddison, i.e. it focuses on a specific information system. The value of information resources is addressed, but not in much detail, i.e. only the relative value of the resources is determined. An "information technology audit" is included as part of this specific information audit methodology. The researcher classifies Gibson's methodology as an operational advisory audit because it is used:

- To establish whether the purpose of the information system 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.

3.8   Jurek

In the article by Jurek (1997:42-43) the information audit is discussed from the perspective of the secondary research analyst. The article contains useful elements to keep in mind when conducting an information audit.

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[5] Some authors suggest a separate "technology" audit for hardware and software or an information systems audit.

Phase 1: Articulate information needs/services

This phase closely resembles a traditional information needs assessment. The researcher has determined that many organisations who complete this phase successfully claim to have conducted an information audit. In view of the definition of an information audit, as well as what it is not (see Chapter 4, paragraph 2), it is clear that an information audit is much more than just an information needs assessment.

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

When analysing the findings of this phase, duplication of services to individual clients can be eliminated, because the auditor will be able to identify areas where standardized information services/products can be delivered (Jurek, 1997:42).

Phase 2: Identify information sources/resources

It is important to identify which information sources/resources clients prefer, when alternatives exist for the same information source/resource. The main question to which an answer must be found is *who-has-access-to-what*.

The findings will be useful for identifying main "information streams" used or preferred by clients, as well as for planning the value-added information services/products (e.g. in terms of delivery format, as well as content and context analysis) (Jurek, 1997:42-43).

Phase 3: Compile proper profiles of information users

Jurek (1997:43) classifies information users according to the two extremes of a continuum of information users, i.e. power users and nonusers. Power users are "information independent" and are capable of satisfying their own information needs. Nonusers on the other hand, usually make use of an information mediary to satisfy their information requests.

During the information audit the analyst should determine where on the continuum the information user should be classified, as this will help in developing the information service. It is suggested that individual files be created for the different information users with a summary of their information profiles on the cover of the file. It is of utmost importance to update these profiles regularly as this will ensure the delivery of a relevant, customized information service (Jurek, 1997:43).

Phase 4: Develop an information management plan

Jurek (1997:43) stresses the importance of building a phase into the information audit during which the cost of information sources/resources are determined. The cost of information must be related to the value of information in the organisation.

The findings of the audit will provide the analyst with an overview of individual information needs, but also an overview of trends of information needs. This information must be used to develop an information management plan (the so-called "action plan") aimed at delivering a value-added information service (Jurek, 1997:43).

Comments by the researcher

Jurek is the only author who includes the development of an information management plan as part of the information audit methodology. This is in stark contrast with authors such as Burk & Horton whose Infomapping methodology is only aimed at discovering and identifying information resources and Orna, whose information audit methodology does not include the "blueprint" with suggestions. The thoroughness with which Jurek conducts the information needs assessment component of the audit, moving beyond a traditional needs assessment and also compiling information profiles of the users, could be looked at when developing an information audit methodology. Despite it being a very good basic information audit methodology there are gaps, especially regarding the investigation of the organisational environment.

Jurek's methodology can be classified as a hybrid approach to information auditing for the following reasons:

- the methodology includes a phase during which the efficiency and effectiveness with which information resources are used, are checked (operational advisory audit);

- the methodology also allows for the calculation of the costs of information resources and determining the value of these (cost-benefit approach).

Jurek's methodology therefore contains components from both the operational advisory audit and the cost-benefit audit.

3.9   LaRosa

LaRosa (1991:7-9) discusses guidelines for performing an information audit. The aim of the information audit is discussed from a marketing perspective, while the methodology itself is based on the method of interviewing.

LaRosa (1991:7) indicates, like a number of other authors, that there is no set methodology for an information audit. She describes an information audit as "more of an evaluative art [rather] than a science". She discusses guidelines that could be followed when performing an information audit within an organisation, based on gathering information by means of interviews rather than using questionnaires.

Phase 1: Identify the potential markets

Make a list of current and potential clients of the library (LaRosa, 1991:7).[6]

Phase 2: Select specific markets

Decide which of the client groups and/or organisational units will be included in the information audit. The ideal is to audit the entire company but this may not always be possible. LaRosa (1991:7) suggests that one take into account the "information intensity" of various organisational units when one has to decide which units to audit.[7]

Phase 3: Identify appropriate contact persons

At least one contact person should be identified for each of the organisational units to be audited. Contact persons will probably be managers or heads of departments or divisions. According to LaRosa (1991:7) the auditor should also try and identify employees involved in planning activities, product management or analysis.

Phase 4: Send a memo to each prospective interviewee

LaRosa (1991:7) suggests that the auditor send a memo to each prospective interviewee in which he explains the purpose and scope of the audit and in which he indicates that he will be contacting him/her in the near future to set up an appointment for an interview. Informing the individual in advance often leads to greater success.

Phase 5: Call and make appointments with each interviewee

Draw up a schedule of interviews. Allocate approximately one hour per interviewee and space the interviews properly, in order to allow for longer and shorter interviews. Spacing the interviews properly with enough time in between interviews, also allows the auditor to review the information he has obtained. The auditor should take into account his own preferences, e.g. whether he functions better in the morning or in the afternoon. Confirm the appointments with the various interviewees. At this point the auditor should also request copies of the goals of the various organisational units and/or information on the functions performed. This background information is important as it will help the auditor to identify critical issues, before conducting the interviews (LaRosa, 1991:7-8).

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[6] The auditor can use an organogram in order to determine the way in which the organisation is structured.

[7] The information intensity refers to the volume of information required by users on a regular basis and which supports them in the execution of their tasks.

Phase 6: Conduct the interviews

Arrive on time for the interview and start the interview by giving the interviewee an overview of the scope, purpose and expected results of the information audit. The best method to follow is to use a structured questionnaire as basis for the interview. This ensures that the same type of information will be obtained from each interviewee and that all the information needed will be gathered. LaRosa (1991:8) stresses that it is important to keep track of time during the interview. The auditor should be sensitive to the interviewee's biases and should focus on obtaining relevant information. He should give the interviewee an opportunity to make additional comments at the end of the interview and leave a telephone number where he can be contacted if the interviewee wants to comment on specific issue(s) at a later time.

LaRosa (1991:8-9) makes an important comment in terms of the questions one ask in order to obtain information during the audit. The questions should not ask directly "What information do you need?" The reason for this is that not many people have a clear idea of the types of information they need and use regularly. The questions the auditor asks should rather focus on the activities being performed and where information is obtained for these purposes. In this way the auditor will be able to determine "how, when and why each group seeks information".

Phase 7: Compile and analyse the results of the interviews

LaRosa (1991:8) states that it is a good idea to review the information one has gathered after the completion of one or two interviews. Determine whether any of the questions are too vague or misleading and might therefore confuse the interviewees. Make changes, if necessary.

Once the interviews have been completed, the auditor must make sense of a large collection of information. Group together the results of interviews for each organisational unit. Summarise the findings and focus on critical issues and challenges facing each of the units. Lastly, identify common trends.

Comments by the researcher

LaRosa presents the reader with a very practical discussion of how to go about performing an information audit. Even though the costs of information resources are not calculated and the benefits of these are not determined, the methodology focuses strongly on the organisational environment and how the information resources contribute to the goals of the organisation. For this reason LaRosa's methodology is classified by the researcher as an operational advisory audit.

3.10   Lubbe & Boon

The information audit methodology that was developed by Lubbe & Boon (1992:215) was based on the general systems approach (as reflected in the methodology for the design of information systems, as described by Boon & Op't Hof, 1990:183-186).

Lubbe & Boon (1992:214-223) performed an information audit at Vista University. The authors based the information audit methodology on the process of infomapping (Burk & Horton). The following adjustments were made to Burk & Horton's methodology:

- The audit was conducted on a macro graphic level.
- Lubbe & Boon (1992:216) also combined steps one and two of Burk & Horton's methodology, i.e. the identification of the information resource entities and costing and valuing of these, were performed simultaneously.
- Personal information resources of staff members were not identified.

- The identified information resources were evaluated by the managers as well as the users thereof.

- The ultimate purpose of the information audit was to identify the corporate information resources and to specify guidelines for a corporate information management plan (Lubbe & Boon, 1992:216).[8]

Prior to performing the audit, the support of top management was obtained. Following on this a letter was sent out by the Vice-principal, encouraging staff to participate in the information audit. The information audit form was tested in a trial run. This helped to ensure that the questions asked were relevant and clear. The audit was initially performed at the main campus and thereafter at the various satellite campuses (Lubbe & Boon, 1992:216).

Phase 1: The organisational environment

This phase involved the determination of the mission and objectives of the University, as well as the structures/environment of the information resources.

Phase 2: Identification of all internal and external information resources

This phase was aimed at the identification (by means a survey) of all the internal and external information resources that were used by or in possession of the University. The auditor identified strategic information resources through interviews with managers. The managers helped to identify and determine the management methods, objectives, user groups and utility of each of the resources. Since the audit was conducted on a macro graphic level, information resources were only recorded in so far as they were of use within a specific department, as well as outside, i.e. to University officials. (Personal information resources were not included in the inventory.)

The questionnaires were either sent out or handed to different users, e.g. students (library users) and lecturers. Where possible, the researcher assisted users with the completion of the questionnaires. Users received questionnaire forms for each information resource that they used. Two letters were attached to each form: the letter from the Vice-principal, explaining his support of the audit; as well as a letter from the auditor, explaining the background to the audit and the purpose thereof. The second letter also contained guidelines on how to complete the questionnaires. The auditor also used sources such as annual reports, to collect relevant information (Lubbe & Boon, 1992:216).

Forty-four information resources were identified. Examples included: management information systems, library services, financial systems, post and telecommunications services, academic support systems, vocational information for students – to name just a few (Lubbe & Boon, 1992:216).

Phase 3: Evaluation and valuation of the information resources

The identified information resources were evaluated and valued by the users as well as managers thereof. In addition to this, the capital and operating expenses of the information resources were calculated (Lubbe & Boon, 1992:215-216).

Phase 4: Calculation of the capital and operating expense of the information resources

Two cost elements were used in calculating the financial value of the identified information resources, i.e. operating costs and capital costs (Lubbe & Boon, 1992:217).[9]

o   The information audit forms

Lubbe & Boon (1992:216) used different audit forms to collect different types of information during the auditing process. The first, the information audit form, was

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[8] Burk & Horton's methodology only suggests a way of compiling an inventory of corporate information resources. No mention is made of using the results for developing a corporate information management plan.

[9] A detailed explanation is given of how the various costs were determined – see Lubbe & Boon, 1992:217.

used to collect information on the "medium, management, objectives, users, utility, value and cost" of information resources (Lubbe & Boon, 1992:216).

A second, separate form was developed for the evaluation of information resources. This form was completed by identified users and added to the evaluative information that was supplied by managers. A set of value criteria was included in the form and guided the users in evaluating an information resource.[10] The criteria were grouped in two sets of 10 criteria each. The first set was used to measure the value of the information resource itself and the second set to evaluate the quality and availability of the information resources. For information resources where the information content was of no relevance, only the first set of criteria was used to measure the value of the resource, e.g. the telephone system.

o   Evaluation

A semantic value scale was used to determine the value of information resources, as evaluated by users. The mean value for each information resource was determined by adding the different scores allocated to each information resource by individual users and calculating these as a percentage – see example below:

Criterion	User 1	User 2	User 3	Total	Percentage
Accessibility	3/5 +	2/5 +	4/5	= 9/15	= 60%
Ease of use	4/5 +	4/5 +	3/5	= 11/15	= 73%

(Lubbe & Boon, 1992:217)

o   Results

The main conclusion from the audit results, was that the University does use information extensively, but does not recognize information as a resource *per se* (Lubbe & Boon, 1992:217).

Comments by the researcher

The methodology as developed by Lubbe & Boon is quite a comprehensive one, especially when compared to some of the other methodologies discussed in this chapter. The organisational environment is carefully investigated and costs as well as values of information resources are calculated and determined. The audit is advisory by nature (in terms of the specification of guidelines for the development of an organisational information management plan.) The audit methodology does not contain any compliance elements, i.e. evaluating the adherence of information resources to standards and policies. The researcher classifies this specific methodology as a hybrid approach since as it contains elements of the geographical approach (infomapping), the operational advisory audit approach (by investigating how the organisational information resources contribute to the goals and objectives of the organisation) and the cost-benefit approach.

3.11   Quinn

It is important to note that the concept INFORMATION AUDIT is a registered service mark of Arthur D. Little, Inc. (Quinn, 1979:18).

Phase 1: Profile current set up

The main purpose of the information audit is to obtain enough information to compile a picture of the current state of information resources in the organisation. Quinn (1979:18) suggests that one starts this process by compiling an inventory of the

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[10] The researcher identified these criteria as based on those included in the Value-added model, as developed by Taylor 1986.

information resources in the organisation. A profile must be developed for each identified "information center".

The profile for each identified information centre should include the following elements:

- Purpose/goals: The first step is to determine the reason why the specific information resource (under investigation) exists. This will help in determining whether the information resource supports the corporate goals (Quinn, 1979:18).[11]

- Scope: Determine what type of information is supplied to whom. The information that is provided to users can be grouped according to subject area. This overview can in turn be used to evaluate whether the information supplied supports users in performing the tasks that make up the organisation, e.g. whether the collection contains mostly historical information or whether it is updated as frequently as is required (Quinn, 1979:18).

- Services: It is a logical step to investigate the information services rendered, because these are closely linked (or supposed to be closely linked) to the goals of the information resource. The auditor can, for example, look at whether an active or passive information service is rendered (Quinn, 1979:18-19).

- Role: Obtain a clear definition of what the role of the specific information resource is in the organisation. Quinn (1979:19) suggests looking at the organisational chart and determining where the information resource fits into the organisational structure. This will also clarify the reporting relationship of the information resource which in turn influences the way in which it can be managed, e.g. the decision making authority that the manager is allowed. On a more positive note, the findings of this phase of the information audit can be used effectively to restructure or reposition the information resource so that is in a better reporting relationship.

- Cost: According to the methodology proposed by Quinn (1979:19) the cost of the information resources must be calculated by the way it is paid for, i.e. by the users (from departmental budgets) or as an overhead. The problem that is created in the latter instance is that the notion is reinforced that information is "free" or of little value.

- Users: Rate each information resource in terms of the users' perceived value thereof, e.g. the relevancy of the information resource, as well as the frequency with which it is consulted/used. At the same time reasons for dissatisfaction with services or aspects of services can be identified (Quinn, 1979:19).

- Staff requirements: Evaluate the qualifications and responsibilities of staff who manage/handle information resources, e.g. the proportion of clerical staff as compared to professional staff. The findings will clarify whether the staff members are able to manage the specific information resource(s) (Quinn, 1979:19).

Comments by the researcher

The researcher does not agree with Quinn's (1979:18) statement that the "company [information] resources can be easily identified" using this methodology. Quinn bases this statement on a very limited view of what corporate resources encompasses, i.e. "the corporate library or information center and any specialized libraries serving specific divisions such as marketing and R&D". The researcher reckons that this limited view of organisational information resources exclude many information resources, e.g. so-called "hidden information entities", personal information collections, etc.

Quinn places a strong emphasis on taking into account the organisational environment by mentioning it in almost every phase. The cost of the information resources are related to the users' perceived value thereof, i.e. according to the cost-benefit approach. Unfortunately there is no phase for the writing of a report and making recommendations based on the findings of the audit. According to Ellis et al

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[11] The researcher wants to point out at that obtaining background information, such as the corporate goals, is invaluable to the success of the information audit.

(1993:136) Quinn's methodology can be classified as a hybrid approach to information auditing, seeing as it includes components of the cost-benefit approach and shows similarities to the geographical approach.

3.12   Riley

The information auditing process as described by Riley (1975:24-25) 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 (1975:24) 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 (Riley, 1975:24).

- 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 (Riley, 1975:25).

- Redesign efforts: Calculate the costs involved in developing a product from scratch, as opposed to buying a commercially available product (Riley, 1975:25).

- 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, 1975:25).

Comments by the researcher

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.

3.13   Robertson

Robertson (1994:35) provides an overview of guidelines on how to perform an information audit.

Phase 1: The organisational environment

A prerequisite for performing an organisational information audit is a sound knowledge and understanding of the culture and functioning of the specific organisation (Robertson, 1994:35). This is important as information should be used to support the achievement of organisational objectives and goals – whether this is the case will be determined by conducting the information audit..

Phase 2: Determine the purpose of the information audit.

This will be influenced by the resources available for conducting the audit as well as expectations from management. With this information as a basis, guidelines for the execution of the audit should be drawn up. Keep in mind how long it will take to perform the full audit and what it will cost the organisation in terms of financial, human and/or physical resources (Robertson, 1994:35).

Phase 3: Identify who will perform the information audit

The "information auditors" can be either employees or external consultants. Robertson (1994:35) suggests that for the first information audit to be performed in an organisation an auditing team should be compiled consisting of employees as well as external consultants. The size of the team will be determined by the above, i.e. the scope and purpose of the information audit to be performed.

Phase 4: Analysis

The final step is to analyse the information that have been gathered during the performance of the information audit. The findings of the analysis should highlight organisational strengths, weaknesses, opportunities and threats. Conclusions drawn from this information should be summarised in a written report and should include suggestions for improvement and/or possible solutions to identified problems (Robertson, 1994:35).

Comments by the researcher

This methodology places a strong emphasis on the organisational environment. It is not clear whether an information inventory is compiled. Unfortunately Robertson does not provide the reader with details of what happens during the audit itself – it seems as if only the first and last stages of the audit are discussed. The researcher classifies this audit methodology as an operational advisory audit because of the strong focus on the organisational environment and determining how the information resources contribute to fulfilling the organisational goals and objectives.

3.14   St Clair

St Clair (1995a:3-5) describes a basic information audit methodology. This is done in a series of three articles that include many practical examples and suggestions that can be used when performing an information audit.

Phase 1: The questionnaire

Distribute a questionnaire to managers, as well as users and potential users (the so-called "information indifferent") of the library. St Clair (1995a:3-5) concludes his first article with an example of a questionnaire that can be used when performing an organisational information audit. This questionnaire can be customised in order to be used within different environments (see Addendum E).

Phase 2: Interviews

The second article in the St Clair's series on information auditing provides a detailed discussion of the interview component of the information audit (St Clair, 1995b:6-8).

St Clair (1995b:6) indicates that the auditor will need two different kinds of information in order to perform a successful information audit, i.e. statistical information and impressionistic information. The first type of information can be gained from the questionnaires that are distributed to the users, while the interviews will provide the auditor with an opportunity of collecting more subjective information. When the auditor interprets the information that has been collected he must create a relationship between the statistical information on the one hand and the more subjective information on the other hand. For this purpose the questionnaire must be designed and distributed.

As a next step, it is important to obtain support from management for the interviews which the auditor plans to conduct. Such support is important in view of the time it will take up, i.e. the time of the interviewees as well as of the librarian. In instances where the librarian does not have the time to conduct the interviews, an external consultant has to be appointed for this purpose. This decision has to be cleared with management (St Clair, 1995b:6).

The auditor has to decide which format the interviews are going to take. He has a choice between one-on-one interviews or focus groups.[12] The ideal is to combine these two methods. In making a decision the auditor has to take into account the organisational politics, as some departments work very well together and would therefore be suited for a focus group, while personality clashes might make one-on-one interviews more desirable in other departments (St Clair, 1995b:6).[13]

Select the employees who will participate in the interviews (regardless of what format they take). The librarian is in an ideal position as he has first-hand experience and knowledge of who uses the library and its services and who does not use it. He can therefore compile a balanced list of participants. St Clair (1995b:7) suggests that before one makes appointments for interviews, one reviews the list of participants. One must review one's choices and the reasons for these choices, e.g. make sure that one or two members of strategic management are also interviewed. Though they might not make use of the library they do use information and one needs to find out from where they obtain it. A good idea is to present the list of potential interviewees to the manager/supervisor of a specific department. Based on his input one might decide to include or exclude specific employees.

St Clair (1995b:7) states that some auditors prefer to interview only those users who did not fill out questionnaires. He disagrees with this methodology. He argues that users who have already completed a questionnaire are better prepared for questions the auditor wants to ask during the interview. The auditor is more likely to get a holistic picture when he interviews a user who has completed a questionnaire, as the purpose of the interview is to cover different issues than those already addressed in the questionnaire.

It is important to follow a professional approach during the interview process. St Clair (1995b:8) suggests the following: send a memo to the users one has decided to interview (explain the purpose of the interview and information audit in the memo); contact them in order to set up appointments (suggest several times during which one can meet them - this ensures better participation). Draw up a schedule of interviews. Allocate approximately one hour per interviewee and space the interviews properly, in order to allow for longer and shorter interviews. Spacing the interviews properly with enough time in between interviews, also allows the auditor to review the information he has obtained.

St Clair (1995b:7) concludes with an example of questions which the auditor can ask during the interview. These questions can be customised for different environments (see Addendum F).

Phase 3: Analysis

This phase entails the processing of the results of the interviews and questionnaires and the interpretation of these within the context of the organisational mission, goals and functions.

The third article in St Clair's series on the information audit offers practical guidelines for the interpretation of data collected during the information audit, specifically comments made during interviews and responses to questionnaires (St Clair, 1995c:5-7).

The first set of information to be interpreted relates to the response rate, i.e. the percentage of completed questionnaires that is returned to the auditor. If the response rate is higher than was expected the auditor can state that a specific percentage of the employees who were questioned exhibit an interest in the library and its services and products. Furthermore, as the auditor had carefully chosen the employees to be questioned so as to ensure that they are representative of the employee community within the organisation, the auditor can state that a specific percentage of the employees of the organisation are actively interested in the library. The result is a statistical indication of the value of the library "to a significant portion" of the employees of the organisation (St Clair, 1995c:5).

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[12] The latter is also referred to as group interviews, though theoretically speaking there is a distinction.
[13] The American Management Association has rated the advantages of focus groups as the best method for determining customers' real needs.

Besides indicating the value of the library within the organisation, the librarian can interpret the response rate in terms of his own significant role within the organisation (St Clair, 1995c:5).

The questionnaire used also contained a number of questions that produced subjective responses (cf. Addendum F). St Clair (1995c:5-6) describes these as "'warm and fuzzy' questions and answers", e.g. "Briefly describe your job". These are included in order to familiarise the person who has to fill out the questionnaire with the type(s) of questions. Once the user has completed the introductory questions, questions regarding information-seeking behaviour follow. From the answers the librarian can determine whether the users are comfortable with searching for and retrieving information. If the answers are negative, the librarian needs to determine what the problems are and then has to develop a strategy to improve the situation.

The next set of questions is more specific, e.g. "Do they use the library for marketing information? For management/decision making? ..." Answers to questions like these will indicate whether the library, its collection, information services and products are relevant to the needs of users within the organisation (St Clair, 1995c:6).

The rationale behind the interpretation of the questionnaires is that the librarian should look for guidelines which will help him to satisfy the *real* information needs of the users. The aim is to customise the library so that it will provide what the users *want*, in stead of what the librarian *thought* they wanted. That is after all the purpose of the information audit: "to listen to your users, to learn about the information needs that they think are important" (St Clair, 1995c:6).

The result of this stage is documented proof of the information needs of the users within the organisation and also of what has to be done in order to satisfy these needs (St Clair, 1995c:6).

The auditor has found out by this time that interviewing is not easy. Nor is it easy to interpret the information that has been collected from the individual interviews and focus group interviews. Most probably the answers indicated that users expected a lot more of the library than is currently on offer. If the interviews and focus groups were conducted by the librarian, he might be very worried about the expectations. St Clair (1995c:6) assures the librarian that he still has the upper hand in this situation as he has expert knowledge on what can and what cannot be done in terms of information services and products. Therefore, before the librarian decides on new plans of action the subjective information must be interpreted in terms of the statistical data.

The result of the above phases of interpretation is "a package of information about information", indicating what the users' needs are, how these needs can be met as well as how well the library is currently performing and how satisfied the users are (St Clair, 1995c:6).

Phase 4: Writing the report and implementing the recommendations

In conclusion, the findings of the information audit have to be documented in a formal report. This report is presented to the management of the organisation, while a summary of the findings contained in the report should be distributed to those users who were involved in providing information for the audit. Furthermore, St Clair (1995c:6-7) suggests that a "press release" on the findings of the audit be published in the newsletter of the organisation. Another way in which to distribute the findings of the audit is to report on it during meetings and informal gatherings. The researcher has found that it is important to distribute the findings and recommendations of the audit in a positive manner, as audits often invoke feelings of fear and uncertainty. Furthermore one owes it to the participants who have sacrificed time in order to help provide information for the audit – they have a right to know about changes that will be made.

St Clair (1995c:7) makes a number of suggestions that should be kept in mind when writing the report. It must be written with a positive "tone": stress how good the library currently is and how much better it can become once the recommendations have been implemented. Be realistic and honest: if it was found that some users satisfy specific information needs through external sources, this should be recognised. The report should also define the boundaries of the library in terms of the information services and products it can realistically and cost-effectively provide.

Once management has accepted the report, the librarian and selected members of management can start work on implementing the recommendations that have been made. In some cases it may be necessary to go as far as to formulate a mission statement for the library. In instances where there is already a mission statement, it has to be decided whether it should be re-formulated in view of the findings of the information audit. Based on this a plan can be developed for the implementation of a strategic plan for the library. The term "strategic" indicates that the purpose of the library and its information services and products are to help the organisation fulfil its strategic objectives. At the same time, the librarian is on "[his] way to the strategic management" of the library (St Clair, 1995c:7). In the long-term the library can become the true information centre of the organisation (St Clair, 1995c:7).

Ironically some librarians do not appreciate "'too much' attention". Users' new awareness of available information services and products may rapidly increase the size of the user population. St Clair (1995a:2-3) stresses that such an increase in users' numbers is an indication of the success of the information audit. One of the purposes of the audit is to document the users' needs for specific information products and services.

Comments by the researcher

As is the case with the articles by Hamilton and LaRosa, St Clair's discussion of information audit methodology is very practical and includes many examples. The organisational environment is carefully investigated, but the cost of the information resources is not calculated. The value of these to the users thereof is determined. There is no specific phase during which an information inventory is compiled. Even though St Clair (1995a:1-5) discusses the information audit within a one-person library, the basic principles can be applied to any information-intensive environment.

The writing of the final report and making recommendations are included as a final phase of the audit. Even though St Clair's methodology does not contain any compliance procedures, this approach to information auditing can be classified as an operational advisory audit for the following reasons:

➢ the purpose of the audited system is defined and it is established how effectively it is being accomplished;

➢ it is established whether the purpose of the information system is in congruence with the purpose and philosophy of the organisation;

➢ the efficiency and effectiveness with which the resources are used, accounted for and safeguarded, are checked;

➢ it is determined how useful and reliable the information system supporting the organisation is.

3.15   Stanat

Stanat (1990:1-21) discusses the strategic information audit and explains two different approaches. These approaches are the top-down and bottom-up approaches and have been used in practice when performing information audits.

o   Top-down approach

Stanat (1990:5) discusses how a strategic information audit was conducted for a consumer packaged goods firm with 10 000 employees worldwide.

The top-down approach is appropriate for use in large companies with several branch offices and a large number of employees. This approach ensures commitment (financially, as well as otherwise) from strategic, functional and divisional management for the performance of the information audit as well as for the implementation of recommendations resulting from the audit (Stanat, 1990:5).

Stanat (1990:5) stresses how important it is to obtain support from top management before attempting to perform a strategic information audit. The manager must have some status in the company, because he will act as an "internal or corporate sponsor."

The researcher has determined that support from top management ensures that the auditor has access to corporate information resources and also encourages employees to lend their support to the audit.

When attempting to obtain support from top management for the performance of a strategic information audit, the auditor should convince them of the potential long-term benefits resulting from the audit, e.g. the fact that information provision will be customised in order to support the achievement of the strategic goals and objectives of the company. Support from top management will in turn ensure that the auditor has the necessary resources for performing the audit (Stanat, 1990:5-6).

Several "arguments" can be used in order to convince top management of the necessity of a strategic information audit, e.g.:

- Emphasize the cost-effectiveness benefits that can result from the audit, e.g. cost savings in terms of the elimination of duplication of effort and information resources; the cost and other advantages resulting from sharing information resources by means of networks; the customisation of information resources to meet the specific information needs within the company. Seen holistically, the competitive advantage of the company will be increased (use real-life examples to strengthen one's case).

- Convince top management that in the long-run the information audit will turn out to be cost-effective (Stanat, 1990:6).

o Bottom-up approach

An alternative to the top-down approach, is the bottom-up approach – also referred to as the division approach. This approach is suitable for companies in which there are a number of divisions with differing but specific information needs. Take for example the situation within a publishing company: the production division may have different information needs than the needs of the editorial division. The most appropriate way in which to determine these information needs as well as how they can best be met is by means of a strategic information audit that follows the bottom-up approach (Stanat, 1990:6-7).

The author discusses how a strategic information audit was conducted for the operating division of a bank. The operating division was structured according to specific unique lines of business. Based on this a survey was designed to determine the information needs at the different levels within the operating division. In contrast to the top-down approach, the bottom-up approach does not require extensive support from top management. One of the advantages resulting from this is that the recommendations of the audit can be implemented faster (Stanat, 1990:5).

o Strategic information audit methodology

As have been indicated before, a strategic information audit is used to determine the information needs within a company. The following step is to determine if the information resources available within the company meet these needs and if they do, how effectively. The findings are interpreted and the result of the audit is a "blueprint for a more effective corporate information or intelligence system." (Stanat, 1990:4).

Phase 1: Planning

During this phase the support of top management has to be obtained (cf. discussion above). A choice must be made as to who will perform the audit. There are two options when it comes to performing a strategic information audit, i.e. the company can either use a group of external consultants or appoint a group from within the company. There are various advantages and disadvantages to both these groups, as will be discussed below.

The advantages of using a group of external consultants are that they are professionals when it comes to conducting the interviews and that they are objective when analysing the results. Often they also have experience in performing information audits. A disadvantage is that they do not have the same insight into the company and its functioning as a company employee might have (Stanat, 1990:9).

On the other hand, an internal task force has the required insight into the culture of the company and the way in which it functions. An internal group however, might lack objectivity in analysing the results. Often such a group also lacks experience (i.e. professionalism) in performing an information audit.

The obvious solution to the problems experienced with the different groups, is to combine the strengths of the external consultants and internal personnel, e.g. appoint a number of employees to perform the audit under the guidance of an external consultant. By doing this, the company ensures the necessary insight into its functioning, while ensuring objectivity (Stanat, 1990:9).

Stanat (1990:16) also stresses the importance of obtaining copies of organisational charts before starting the information audit. The researcher has pointed out on various occasions that this provides the auditor with invaluable background information. For example: one advantage is that it will be easier to determine who should be interviewed. The organisational charts will also assist the auditor in determining the patters of information flow throughout the organisation (Stanat, 1990:16). The author (Stanat, 1990:12) emphasises that this is important information that needs to be obtained because the informal flow of information is often central to the effective functioning of a business (i.e. the informal information network).

Phase 2: Determine the organisational information needs

A questionnaire must be designed. This instrument will be used for gathering the needed information. Stanat (1990:8) includes an example of the types of questions that should be asked during an information audit (cf. Addendum G). The questionnaire can be customized, based on knowledge of the specific company.

Phase 3: Identify the information resources

During this phase of the audit it is important to determine who the person is who is at the "information nerve center" of the organisation, i.e. the person most involved in handling, managing and/or disseminating highly relevant information to the rest of the organisation. The auditor also needs to pinpoint information sources that contribute to attaining critical success factors in the organisation. Examples of such "information nerve centers or gateways" include amongst others: strategic planning departments, corporate libraries/information centres, technical libraries, etc. (Stanat, 1990:18).

Phases 2 & 3: Instruments for collecting information

The information for both phases 2 and 3 are gathered simultaneously by means of interviews. Prior to the interview process, it is useful to identify potential interviewees according to an organisational chart. The employees who form part of the audit team can be helpful in identifying informal networks within the formal structure and the interviews can be structured accordingly (Stanat, 1990:9-10).

The ideal is to interview as many employees as possible. Stanat (1990:4) suggests that one should begin by interviewing the CEO, followed by key executives, as well as managers and administrative staff members from all levels in the company. Furthermore, key staff members from the different functional units should be interviewed while the auditor should also attempt to interview staff members from various branch offices.

According to Stanat (1990:10) the best method to follow when conducting the interviews is to have personal, oral interviews. It must be ensured that the interviews are documented as this information is crucial for analysis.

Firstly, memos must be sent to each of the potential interviewees informing them of the purpose of the audit and emphasising the importance of widespread cooperation from the employees. Call each of the potential interviewees approximately 30-45 days in advance and set up an appointment at a time and place that suits both the interviewee and the interviewer. The interviews are the main means of collecting information and should therefore be at least one hour in duration. Stanat (1990:10) suggests that at least one or two interviewers and one interviewee is involved in each of the interviews. The information that they obtain during each of the interviews will help the auditors to compile a picture of information flow and use within the company.

Phase 4: Analyse and interpret the findings of the audit

Stanat (1990:13) suggests the quantification of information on users' information needs as this will increase the validity of the audit. In the case study that is discussed the company used a spreadsheet to present and analyse information on information needs. The categories that were used were the users' information requirements, the utility of information sources and the corporate information flow.

The findings were quantified and presented as the percentages of the information sources that the information users found relevant to their daily task performance in the organisation (Stanat, 1990:13).

The results can be repackaged in a grid format and this ought to give an overview of the current situation as well as a clear indication of future information requirements (Stanat, 1990:13).

Phase 5: Evaluate the corporate investment in internal and external information sources

The researcher has identified the costing and valuing of information resources as an important identifying criterion of what constitutes an information audit. Stanat (1990:19) also places strong emphasis on this phase of the auditing process. According to her answers should be found for the following questions: "What does it cost and organization to attain, gather, store, and disseminate information that is obtained either within the organization or from external and published sources?" The researcher has identified this as a very important result of the information audit, i.e. comparing information sources to information needs and by implication, corporate goals.

o Investment in internal information sources

Internal information sources are defined as all "those documents created on a daily basis by employees of the company." Stanat (1990:19) suggests using the following simple equation to calculate the monetary value of these information sources:

Corporate investment in internal documents	=	[Number of hours to generate document	x	Labour rate(s)]	+	Cost of input to develop the document	+	Cost of document materials

Stanat (1990:19) furthermore suggests that the calculation be done per department or organisational unit.

o Investment in external information

External information sources include those sources that have been purchased by the organisation (as opposed to the internal sources that are created in the organisation), e.g. newspapers, journals, books, reference materials, videotapes, etc. The following equation can be used to calculate the organisational investment in external information sources:

Corporate investment in external documents	=	Actual cost of the document	+	Manager's time to digest the document	+	Cost to distribute the document	+	Cost to store the document

(Stanat, 1990:20)

Phase 6: Develop a strategic intelligence "blueprint"

The results of the analysis phase must be used to develop a so-called strategic intelligence blueprint. This blueprint will point out any discrepancies between users' identified information needs and the information (re)sources used to satisfy these needs (Stanat, 1990:12). If possible these findings should be represented graphically as this

will make the presentation of the findings more accessible, especially to members of staff with busy schedules, e.g. top management (Stanat, 1990:12).

A second important aspect that will become clear in the strategic blueprint is an overview of the formal and informal information flows in the organisation. The informal information network ought to be clearly revealed (Stanat, 1990:12).

In developing the blueprint, the following aspects should be included:

- Discovering information needs.
- Tracking information flow.
- Identification of information nerve centre(s).
- Evaluation of the corporate investment in internal and external information sources.

Once the first information audit has been performed, smaller follow-up audits can be conducted to keep the planning information relevant e.g. annually (Stanat, 1990:4,21). This ensures that the company stays competitive and its information sources relevant.

Comments by the researcher

Stanat provides the reader with a very thorough discussion of how to go about performing an information audit. The methodology is complete in that it includes important components, e.g. defining the organisational environment; identifying information needs and information resources,; costing and valuing the latter; tracking information flows; writing a report and making recommendations. This methodology serves as a good example of what an information audit methodology should look like. The researcher identifies Stanat's methodology as an example of the hybrid approach to information auditing because of the geographical component and the components of the operational advisory audit that it contain.

3.16 Swash

Swash (1997:314) states that there is currently no standardised or prescribed approach for conducting an information audit. According to this author (Swash, 1997:314) the ideal scope of the information audit (in order to reap maximum benefit) is an organisation-wide survey performed with the purpose of identifying organisational information sources. This is done in correlation with the approach discussed by Burk & Horton (Infomapping, 1988) to determine the "information resource entities" (IREs) in an organisation. The identification of the organisational information sources is combined with the recording thereof and this in turn is followed by the analysis of the findings. The value of information audits performed on a smaller scale is not dismissed however (Swash, 197:314).

Phase 1: Planning

During the planning phase the scope of the information audit is determined; the objectives of the project are identified; and a plan of action is drawn up accordingly. A decision must be made regarding a data collection method (e.g. interviews or questionnaires or a combination of these). The choice of a data collection method is influenced by various factors such as the size of the population that will be included in the audit, as well as time constraints. Time can be saved by collecting data from focus groups.

The support of top management for conducting an information audit is essential to the success of such a project as the findings and recommendations from the audit will have an impact on the organisation as a whole (Swash, 1997:314-316).

Before conducting an information audit in an organisation there must be agreement upon the definition and scope of such an audit. This is a problem when one takes into account that variety of definitions of the concept "information" (Swash, 1997:315). The researcher has found that the same applies to the definition of the concept "information audit" (cf. the discussion in Chapter 4, paragraph 2). Furthermore the unique characteristics of information resources (e.g. the pervasiveness of information)

make it difficult to design a methodology for conducting an organisational information audit.

The next phase in the information audit, is to select members to serve on the auditing team. Swash (1997:315) identifies three possible scenarios, i.e. the use of an internal project group, the use of external consultants, or a combination of these two.

Phase 2: Data collection

The size of the organisation determines the size of the population to be included in the survey. In a very large organisation it is impossible to include all employees. There is no hard and fast rule either for determining the size of the survey population (Swash, 1997:316). It is once again clear to the researcher that the specific situation determines the size of the population.

Swash (1997:316) refers to Stanat when discussing guidelines for determining whom to include in an information audit survey. Identify those individuals who have insight into the organisation and its strategic functioning. In organisations where many individuals have to be interviewed, it is suggested that less detailed questionnaires be compiled. Interviews, specifically structured interviews are a preferred data collection method.

The disadvantage of using interviews, even structured interviews, as a data collection method is that the duration and scope of the interviews will vary and that unique answers will be given. It is therefore of the utmost importance to ensure that the collected data be processed according to a consistent method (Swash, 1997:316).

The main purpose of data collection during an information audit is to acquire information that focuses "primarily on business activity" and to determine what information is used in support of this. Unfortunately research findings have shown that few managers are able to specify what information sources they use and need - currently and with a view to the future. Swash (1997:316) also states that the nature of the activities performed by an employee determines the type(s) of information used and needed, e.g. highly specific information is needed in a research environment versus the relatively vague information needs that is found in a marketing department. The latter will be determined to a large extent by happenings external to the organisation and will only become clear shortly before the information is needed (Swash, 1997:316). The researcher reckons that data collection should be performed in such a way as to determine the users' perspective as the information will be needed to develop the organisational information management plan. The latter will in turn be focused on satisfying the users' information needs.

Phase 3: Analysis

The findings to the question of what information is needed in support of the primary business activity of an organisation should be weighted (in order of priority) according to Swash (1997:316). Information-related problems should also be recorded, e.g. the non-availability of information, the lack of timely and relevant information, etc.

Phase 4: Information technology audit[14]

In some instances the information audit can be used to audit the information technology that is used to provide access to information. Swash (1997:317) stresses that "[t]he concept of information, its value and its use, should be separated from the consideration of the technology on which it resides". There are aspects of information technology that will reveal useful information, e.g. the reliability, appropriateness, compatibility and usage of information systems.

Phase 5: Costing and valuing

Another issue that should be investigated during an information audit is the complex problem surrounding the value and cost of the information sources that have been identified. Value is best measured in terms of the benefits derived from the use of specific information sources. A lot has been written on the problems surrounding the way(s) in which to measure/determine the value of information sources (cf. Chapter 4). The simplest explanation states that the value of information is qualifiable (e.g. time

[14] This phase is optional to the information audit methodology.

saved or benefits arising from actions that were based on information), in contrast to the cost of information that is quantifiable. Swash (1997:317) stresses that the information audit should distinguish clearly between the value and the cost of information sources. Findings could even prove the value of information much higher than the cost thereof. Swash (1997:317) warns however that "[t]he problems of quantifying the exact contribution of a specific term of information may, however, prove insurmountable." The researcher identifies this as an aspect of the information audit where more research will have to be done. The development of a standardised method for determining the cost and value of information sources needs to be investigated.

Phase 6: The report

Finally the report must be prepared. The report will contain findings on the cost of organisational information activity, information gaps, as well as areas where duplication take place. The report will highlight information flows (whether effective or ineffective), information ownership and current involvement in and responsibility for information management. All these findings will contribute to drawing up a picture of the organisational information needs and priorities. Swash (1997:318) stresses that in order to obtain maximum benefit from the information audit and its findings, the results must be linked to the strategic objectives of the organisation and the necessary corrective action must be implemented.

Swash (1997:313) briefly discusses the "classification" of organisational information sources. The researcher has determined that the type of distinction made very often effects the way in which these information sources are managed. According to Swash (1997:313) the most common distinction is the one made between internal and external sources of information (cf. Table 5-1).