THE INFORMATION AUDIT AS A FIRST STEP TOWARDS EFFECTIVE KNOWLEDGE MANAGEMENT: AN OPPORTUNITY FOR THE SPECIAL LIBRARIAN[*]

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Introduction

Knowledge is universally recognized as the most important strategic asset that an organisation has. Despite this recognition many information units are being closed or downsized and organisations are encouraging information users to acquire, control and manage their own resources that support knowledge creation and development. Controlling the acquisition of, and access to, information resources is becoming increasingly difficult as vendors bypass the information professionals and market directly to the end-user. Compounding this problem is the availability of information in a multitude of formats and the exponential growth in the number of products available. This necessitates a higher level of evaluation and control to ensure that quality information is available to those who need it.

Because of this proliferation of information products and delivery methods, information users within organisations are suffering from 'information overload' and in many cases are using a variety of resources to gather their information, some of which may be not be the appropriate for their needs. Many organisations are structured in such a way that the business units operate independently of one another, yet they rely on similar information resources. Some operate without the resources they need because they don't know where to find them, while others engage in 'information overkill' and purchase anything that looks like it might be relevant. Consequently there are often significant gaps, inconsistencies and duplications in information resources within an organisation.

As well as ensuring that the appropriate information is provided, there must be a clear and visible alignment of the information that is acquired by the information users with the organisational or business unit objectives. The challenge for today's information professional is to identify the information that is needed to optimize

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the achievement of organisational objectives, who it is needed by, how it will be used, its source and how it flows through the organisation and between the organisation and its external environment. The information audit is an established management methodology that will address all of these issues.

The information audit is a process that will effectively determine the current information environment by identifying what information is required to meet the needs of the organisation. It establishes what information is currently supplied, and allows a matching of the two to identify gaps, inconsistencies and duplications. The process will also facilitate the mapping of information flows throughout the organisation and between the organisation and its external environment to enable the identification of bottlenecks and inefficiencies.

This paper defines the information audit as a tool that can be used to not only identify strategically significant information resources, but to also identify those tasks and activities that create knowledge and those that rely on the transfer of knowledge from other areas of the organisation. It firstly describes the relationship between the information audit process and knowledge management. Secondly, it introduces the seven stage information audit model. It discusses each stage of the model in terms of its contribution to the process and the desired outcomes. It concludes by examining the potential benefits of using the information audit as a foundation that can be built on as the knowledge management strategy is developed.

From information management to knowledge management

'Knowledge management encompasses both the management of information and the management of people. Knowledge cannot be managed directly – only the information about the knowledge possessed by people in organisations can be managed.'
(Streatfield and Wilson, 1999, p70)

This statement by Streatfield and Wilson is an example of the emerging recognition that sound information management practices form a solid foundation on which successful knowledge management strategies can be developed. Good information management is seen as the essential prerequisite to knowledge management (Horne, 1999) yet many organisations are developing knowledge management strategies based on technical systems that disregard the information resources and the people who create the knowledge.

Defining knowledge is difficult, as it incorporates many intangibles such as experience, intuition, judgement, skill and lessons learned which have   the potential

to create value for a business by informing decisions and improving actions. Knowledge is constantly being created by employees as they do their jobs. Some of this knowledge can be articulated, captured, stored and accessed for re-use. Much of the knowledge, however, is tacit knowledge and is never articulated until the need to re-use it occurs.

The first step in any knowledge management program is to identify where knowledge is being created, where it already exists and where it is needed to support decisions and actions. Organisations that have not yet developed a strategy for managing their knowledge, or those that have a strategy in place that could be working better are in an ideal position to go back to basics and find out exactly what knowledge they need to manage to gain a competitive advantage using an established information management methodology. Using the information audit as a first step in developing a knowledge management strategy or improving the strategy you have can ensure that you are managing the knowledge your organisation needs to manage to be successful.

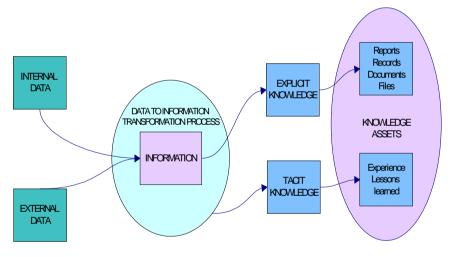## Figure1:From data to knowledge

Figure 1 illustrates the 'data to information to knowledge' process that occurs in every organisation. Moving from left to right - data is used to enable and support the tasks and activities of its business units, sections or departments. The data can originate inside the organisation or be acquired from external sources. As a task or activity is performed the data is transformed into information which is then filtered, further transformed, reused, stored, or transferred. The process of creating

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information, the data to information transfer process, is a knowledge-creating process that creates both *explicit* and *tacit* knowledge.

Explicit knowledge is the output of tasks and activities that can be documented as reports, databases, procedures etc. It is easily captured, stored and communicated. *Tacit* knowledge resides in the heads of employees and is more difficult to capture and communicate. It consists of the lessons learned by doing a job and is made up of gathered experience and understanding. Tacit knowledge is of no value to the organisation until it can be applied as the knowledge held by an employee is of no value until that employee can use it for the benefit of the organisation. The tacit knowledge that is created during this process as people assist in the transformation and experience it is often lost unless methods can be developed to identify and capture it and then enable access to it so that it can be applied. The knowledge asset that needs to be managed by an organisation, illustrated at the far right of figure 1, consists of both explicit and tacit knowledge and any knowledge management strategy that is developed must incorporate them both.

Developing a knowledge management strategy

There is no generic model for developing a knowledge management strategy as each organisation has unique needs that must be identified and understood. Some organisations are embarking on knowledge management programs without an understanding of why their knowledge assets are important. Rather than being in a position to make informed decisions about what knowledge they need to manage, they attempt to manage everything, whether it is significant or not. They often consider the information technology infrastructure to be the knowledge management system, rather than merely the enabler, and think that all they need to do is buy an expensive computer system and it will all be done for them.

To develop a knowledge management strategy that incorporates the management of both tacit and explicit knowledge it is critical that the knowledge creation process is understood and that the understanding extends to the role of the people involved in the process. The first step is to identify where knowledge exists and where it is needed to support decisions and actions. An understanding of the organisation and how it works, including its structure and culture, internal and external relationships, formal and informal communication networks is critical as these are the characteristics that will determine the best way in which to manage knowledge in that particular organisation.
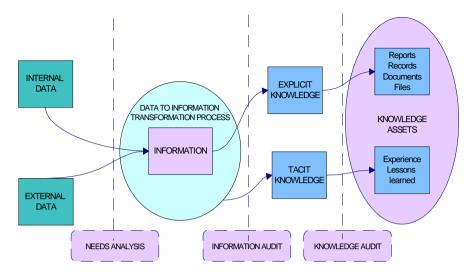
Figure 2: From needs analysis to knowledge audit

Figure 2 illustrates the three audits that are used to move an organisation from information management to knowledge management. They are the needs analysis, the information audit and the knowledge audit. It also indicates the point in the data to knowledge process where they are each the most useful.

The *needs analysis* is a process by which information users are asked precisely what information resources or services they need to perform their jobs. It usually results in a list of resources that are required by each person or department, and can be used to rationalise acquisitions (determining what will be bought and who will it be bought for), delivery mechanisms (getting the right resources to the people who need them) and service levels (identifying who needs specific services and at what level).

The *information audit* goes one step further in not only finding out what information resources and services people need to do their jobs, but how those information resources and services are actually used. It looks at the objectives, critical success factors and tasks and activities of each group, business unit, department or section, and links them with the relevant organisational objective. It identifies the information that is required to support each task or activity. It is then possible to trace a specific resource from the task it supports to the organisation objective, and assign a level of strategic significance to it. This allows you to not

only identify those resources and services that are supporting organisational objectives but also to 'rate' them according to their strategic significance.

An information audit also enables you to map information flows within an organisation and between an organisation and its external environment. This is a significant feature of the process as it identifies the existing formal and informal communication channels that are used to transfer information as well as highlighting inefficiencies such as bottlenecks, gaps and duplications.

A *knowledge audit* is conducted to identify an organisation's knowledge assets, how they are produced and by whom. If an information audit has already been conducted, a knowledge audit will also allow you to assign a level of strategic significance or importance to those knowledge assets using the organisational data already established. This ensures that you not only know what knowledge assets exist, but that you identify those that are critical to the success of the organisation. Your knowledge management strategy can then focus on the knowledge assets at their various levels of criticality, rather than managing everything regardless of its significance.

Conducting an information audit prior to developing a knowledge management strategy will enable you to determine what information you need to manage by assigning a level of strategic significance to resources. It provides a 'snapshot' of information use that enables the identification of those areas of the organisation that are producing knowledge and areas where there is a need for knowledge-transfer mechanisms.

The information audit

For many years the information audit process has been promoted by information professionals as a means of identifying the information needs of an organisation and matching them against existing services and resources. In more recent years it has been used extensively, mainly by consultants, as the first step in the development of a knowledge management strategy.

An information audit is *'a systematic evaluation of information use, resources and flows, with a verification by reference to both people and existing documents in order to establish the extent to which they are contributing to an organisation's objectives'.* Although there is no universally accepted definition of an information audit, this definition adopted by Aslib, the Association for Information Management in the UK is the most appropriate as it incorporates the critical elements of 'information use' and 'people' (Orna, 1999 p69). An information audit is a process used to -

- Identify the information needs of the organisation and assign a level of strategic importance to those needs

- Identify the resources and services currently provided to meet those needs

- Map information flows within an organisation and between an organisation and its external environment

- Analyse gaps, duplications, inefficiencies and areas of over-provision that enables the identification of where changes are necessary

The term 'audit' implies a counting. An information audit not only counts resources but also examines how they are used, by whom and for what purpose. The information audit examines the activities and tasks that occur in an organisation and identifies the information resources that support them. It examines, not only the resources used, but how they are used and how critical they are to the successful completion of each task. Combining this with the assignment of a level of strategic significance to all tasks and activities enables the identification of the areas where strategically significant knowledge is being created. It also identifies those tasks that rely on knowledge sharing or transfer and those that rely on a high quality of knowledge.

The information audit process enables the mapping of information flows within an organisation and between an organisation and its external environment. As well as identifying efficient flows, it also identifies gaps, duplications, bottlenecks and other inefficiencies in existing flows. It identifies existing channels that can be utilised for knowledge-transfer and areas of the organisation where there is a need for high quality knowledge that isn't being met.

How to conduct an information audit - introducing the model

Just as there is no universally accepted definition of an information audit, there is also no universally accepted model for the information audit process because of the dramatically varying structures, natures and circumstances of the organisations in which they are conducted. The model presented here is one that was developed by the author as a result of examining the methodologies used by librarians and consultants and extracting the components necessary to achieve the objectives of an information audit.

The seven-stage information audit model as shown in figure 3 takes you through the information audit process stage-by-stage highlighting those aspects of the process that are critical to its success and the issues that you may face that can impact on the value of your outcomes. The seven stages are -

1. Planning
2. Data collection
3. Data analysis
4. Data evaluation
5. Communicating recommendations
6. Implementing recommendations
7. The Information Audit as a continuum

The model is not a highly structured and controlled process that operates in a tightly defined manner. Rather it is a structured framework that is flexible and can 'bend' to meet the varying conditions and constraints of an organisation. In other words, the components can be 'tailored' to suit to the objectives of the organisation and the resources available (Henczel, 2000).
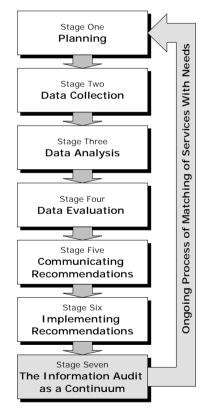

Figure 3: The seven-stage model

Stage One - Planning

As with any major project, the planning stage is critical as it can determine the project's success or failure. To plan properly for an information audit there are five steps to work through. These are -

1. Understand your organisation and develop clear objectives
2. Determine the scope and resource allocation
3. Choose a methodology
4. Develop a communication strategy
5. Enlist management support

Step 1 - Understand Your Organisation and Develop Clear Objectives

Understanding how the organisation functions is critical to the success of an information audit. Structure, culture, communication issues, political issues, internal relationships and relationships with external entities must all be understood before an appropriate information audit methodology can be developed. This is important because the audit process must be designed to minimise the obstacles and maximise the opportunities that exist within the organisation.

There will be a number of stakeholder groups to consider. Information users, organisational management, information professionals, and knowledge managers are just some of the possibilities. It is important to not only understand who the stakeholders are, but why they are stakeholders and how they can impact on the success of the information audit project.

It is important to understand where the organisation is at with regard to its information management and knowledge management strategy development as it may be necessary to link in with other projects, committees and processes that have already been established. Find out what else is going on the organisation that this project could link with, support, or receive support from.

It is necessary to have a clear understanding of why you are conducting an information audit, and of the specific objectives you hope to achieve before you can begin to sell the idea to management or to the employees of your organisation. Ensure that your objectives are clear and simple, specific, realistic and measurable. When the purpose of an information audit is to form a foundation on which to 'build' a knowledge management strategy the objectives are to -

- identify the tasks and activities that potentially produce strategically significant knowledge assets

- identify strategically significant information resources

- identify and map information flows

Step 2 - Determine the Scope and Resource Allocation

This step involves identifying the resources that are available to conduct the audit, and defining which parts of the organisation will be included.

There are two ways in which to scope an information audit. The first is physically by deciding which parts of the organisation will be included and at which level the audit will be focused. Conducting an audit across 3000 frontline people is enormously more expensive that targeting their section or department managers. There may be parts of the organisation that can be reasonably excluded.

Resource allocation involves not only people (audit manager, team, administration), but also time, money, technical resources such as computers and telephones, and physical resources such as desks and working space. At this stage you must also consider whether sufficient expertise is available within the organisation or whether you will need bring in additional expertise.

Step 3 - Choose a Methodology

This step involves the design of a methodology for conducting your information audit. Data must be collected, analysed and evaluated. Recommendations must be made and presented for implementation. From whom do you need to collect data and how will you collect it? How will you analyse what you collect? How will you communicate the purpose of the audit, communicate with data contributors during the audit, and present the findings after the audit?

Step 4 – Develop a Communication Strategy

Identifying the appropriate communication channels during the planning stage will facilitate effective communication before, during and after the audit. It is important to begin communication before the audit has started to ensure that everyone understands the purpose and objectives and can better understand their role in the data collection stage. During the audit process it is important to be able to address concerns that employees might have as they arise and to continue to promote the audit as a strategically significant project. This ensures a broader ownership base which increases support for the recommendations. Effective feedback after the audit will generate support for the implementation program which will minimise resistance to the suggested changes.

Step 5 - Enlist Management Support

For any project such as this to be successful you will need management support. To obtain approval for the allocation of resources it is important to have a clearly defined and comprehensive business case that details the project's objectives, methodology, potential benefits and relationships with other projects. It is important to also include details of the consequences for the organisation of not conducting the audit.

Finding a sponsor in the organisation who can liaise between the audit team and senior management and promote the audit can significantly improve the chances of success. A high level sponsor will raise the profile of the information audit, ensure a higher level of support for the project and open new communication channels.

One these steps have been worked through you will have determined how you can conduct an information audit with the resources that you have available to you, what questions you have to ask to get the data you need to achieve your objectives, how long it will take, and what level of management support you have to do it.

Stage Two - Data Collection

This stage involves collecting the data you need to achieve your objectives. Data can be collected by questionnaire, personal interview or focus group interview. Whether you create a questionnaire or conduct interviews it is critical that the right people are asked the right questions. It is critical that the questions you ask result in a dataset that is usable, in terms of its volume, its content and its format. It is usual to collect three types of data –

1. data relating to information required to perform tasks and activities
2. data relating to the 'level of criticality' of information resources, tasks and activities
3. data relating to information transfer

This stage also involves the creation of an information resources database that is used as the tool to establish the strategic significance of resources. Records must be created for all business units/sections/departments that include their objectives, critical success factors and tasks and activities. The data collection process will gather the data relating to the information resources that enable and support the tasks and activities.

Stage Three - Data Analysis

Once the data has been collected it must be analysed. The analysis process will identify gaps, duplications and over provisions and the use of sub-standard or inappropriate resources. It will enable a level of strategic significance to be

assigned to tasks and activities that can then be used to determine where critical knowledge is being produced and stored and where it is required for re-use.

Analysis can be done inhouse or by external analysts, depending on the resources available inhouse, and the complexity and volume of the data collected. There are a variety of tools available to facilitate the analysis process. These range from common spreadsheet and database programs such as MS Access and MS Excel, specialist qualitative and quantitative data analysis programs such as Atlas.ti and NUD*IST through to the more sophisticated business modelling tools such as System Architect 2001 and ProVision Workbench. Drawing tools such as ABC Flowcharter or MS Draw can be used for the mapping of information flows.

There are three types of analysis carried out on the data collected – (1)general analysis, (2)strategic significance analysis and (3)information flow mapping.

General analysis: data collected by any open questions is analysed generally using common spreadsheet or database programs or specialist analysis tools.

Significance analysis is done using the information resources database. The database can be used to develop an 'information and knowledge inventory' and to enable the matching of resources and knowledge development with business unit or organisational objectives. This allows a measure of strategic significance to be assigned to resources used and to knowledge generated. The information resources database can be used to generate reports such as -

- the tasks supported by each information resource
- the importance of each information resource to the tasks it supports
- the information resources that support each organisational objective
- the tasks for which the 'ideal' resources are not provided
- duplications of resources

The mapping of information flows enables the identification of gaps, duplications and flow inefficiencies. It can also form the basis for a 'knowledge transfer' model by identifying where knowledge is created, where it is needed and where it currently goes (if anywhere). Visual representation of the information flows can identify -

- bottlenecks and inefficiencies (lots going in but very little coming out)
- information gatekeepers (lots coming in through a single distribution point)
- dead ends (lots going in but nothing coming out)

- over provisions (services provided but not required)

- gaps (non-provision of critical resources)

- imbalances/biases (inequalities in information provision)

Stage Four - Data Evaluation

Once the data has been analysed, problems and opportunities can be identified and then interpreted and evaluated within the context of the organisation. Not every problem will need to be addressed and some will be unable to be addressed due to organisational constraints such as insufficient resources (people, money, technical or physical resources).

Many of the problems that are identified are opportunities to improve the provision of information and extend information services and improve the quality of knowledge created. They can include -

- information hoarding

- biased distribution of resources

- use of sub-standard resources

- gaps in the provision of resources

- information overload issues

- lack of transparency and accountability

- lack of traceability

To evaluate how significant the problems are a number of questions need to be answered before a decision can be made regarding the feasibility and cost-effectiveness of addressing the problems. These relate to its level of criticality, the cost of addressing it, the cost of not addressing it, and the level of formality needed to address it (local, departmental or organisational). Some examples are -

- does the problem have strategic significance? (is it affecting the achievement of organisational objectives?)

- is there a reason for the problem? Does it matter?

- what are the cost implications?

- what alternatives are possible?

- what are the implications of suggesting a change? Who will be affected? What other services will be affected? What barriers will be faced?

For each problem that is identified there may be more than one solution and it is important that the most appropriate solution is recommended. The measure of suitability of each solution must be determined to by using a weighting system to measure them against a common set of criteria. If this process is performed correctly and objectively the solution with the highest score is the best alternative.

It is important that the recommendations that are formulated in this stage are realistic, achievable and manageable. The costs associated with the recommendation, the processes for incorporation and implementation and quantifiable goals must all be established and documented.

Stage Five - Communicating the Recommendations

Communication strategies are important throughout the entire information audit process, however it is critical that once the recommendations have been formulated, they are communicated to the people who are integral to them being implemented. Because many of the recommendations will represent an element of change to the resources and services available in the organisation they may affect the daily work processes of some, if not many, employees. It is critical that the changes are communicated in a positive way, and in a way that guarantees management support for their implementation. Also, if you have established and maintained successful communication channels throughout the audit process, the employees will recognise the validity of the process that has been worked through to reach the final recommendations.

There are many ways in which you can communicate the information audit results and recommendations. The most common method is a written report, with the second most common being an oral presentation (or a series of presentations depending on the size and structure of the organisation). Other methods include seminars and workshops, newsletters and bulletins either in hardcopy or posted on corporate intranets and web sites.

Stage Six - Implementing the Recommendations

Once the findings of the information audit have been developed into strategies, and the recommendations that have been formulated from the strategies have been successfully communicated to management and throughout the organisation, plans must be made for the implementation of the recommendations. Nothing can be changed in isolation and each change that is made in an organisation has a roll on

effect. This must be understood when formulating the recommendations, and also during the implementation process. The development of a comprehensive implementation plan and a post-implementation review strategy will facilitate the changes and minimise resistance.

The way in which the implementation program is developed will depend on what the recommendations are and to what extent they will impact on the individuals and groups that are affected. Whether they are minor or major changes, if their implementation is to be successful they must be carefully planned and executed. Even seemingly minor changes can be unsuccessful if their impact is underestimated or if they conflict with aspects of the political and cultural environments that exist within the organisation.

Stage Seven - The Continuum

The initial information audit is the 1st generation information audit (Buchanan, 1998). It has provided you with a rich dataset that presents a 'snapshot' of where the organisation is at with regard to its information - this is your first *information baseline*. It has also provided you with a database that contains information relating to the information resources, and the organisation's business units and tasks and activities. Subsequent audits add to the dataset and re-assess the validity of the information baseline which is constantly changing as the organisation changes. They also add to and supplement the information resources database to reflect changes in significance, tasks or organisational structure.

Once the initial information audit is complete, a decision must be made about how the datasets can be maintained and built on with subsequent information audits to regularly review the information environment. Each subsequent information audit (2nd generation and beyond) need not be conducted using the same framework. They may vary in their scope, for example be restricted to a single business unit, or a group of business units, a geographical area, or a functional section of the organisation. The methodology used could also vary according to the objectives of a specific audit. This is known as 'tailoring' the audit to suit the objectives.

The conducting of 2nd generation audits will not only ensure that resources meet needs, but will also ensure that the data gathered during the 1st generation audit are built on. 2nd generation information audits must not be conducted in isolation and must measure and account for any changes that have occurred since the previous audit. Each information audit that is conducted adds to the information resource database. As the organisation changes, the changing needs can be matched with either existing or new resources using the data stored in the database.

From information audit to knowledge audit

Conducting an information audit provides an improved level of understanding of how the tasks and activities performed by the business units, sections and departments of the organisation create knowledge and what the level of strategic significance of that knowledge may be. It has also provided a 'map' of existing formal and informal information transfer and communication channels and networks within the organisation and between the organisation and its external environment. The outcomes of the information audit can be built on by conducting a knowledge audit which examines where knowledge is being produced (where it is an output of an activity), and where it is needed as an input to a task or activity. It identifies where there is a need for an internal transfer of knowledge and knowledge-sharing activities. From this data the strategies can be developed to address the issues of knowledge capture, access and storage, dissemination and validation.

A knowledge audit has two main objectives, with the first being to identify the 'people' issues that impact on knowledge creation, transfer and sharing. These include the communication issues that enable or prevent knowledge transfer, and the cultural and political issues that impact on the success of knowledge management strategies. The second objective of a knowledge audit is to identify which knowledge can be captured, where it is needed and can be reused, and to determine the most efficient and effective methods to store, facilitate access to and transfer of the knowledge. By building on the outcomes of the information audit with a knowledge audit you are able to incorporate your information and knowledge management strategies to ensure that strategically significant knowledge is identified and managed appropriately, and that the most appropriate resources are provided for its ongoing creation.

Conclusion

So, why conduct an information audit? An information audit is a means by which an organisation can better understand how the tasks and activities that it supports contribute to its success. Conducting an information audit will increase the understanding of how an organisation works with regard to information and consequently with regard to knowledge. Using the information resources database developed to store the collected data it enables the determination of how well tasks and activities are aligned with organisational objectives and the strategic significance of not only the tasks and activities, but also the information resources. This flows on to other processes and enables the elimination or minimisation of non-strategic tasks and their associated support services. The information audit can

form a solid basis for the development of a knowledge management strategy by providing the foundation dataset for a knowledge audit that enables the identification of how and where knowledge is being created and used, and where it is needed to improve outputs.

The consequences of not conducting an information audit prior to conducting a knowledge audit or developing a knowledge management strategy can cause significant direct and indirect costs for an organisation. When an organisation is unaware of the strategic significance of its knowledge assets it manages everything rather than what it is necessary to manage. The direct costs increase as the program requires more people and technical resources and the indirect costs increase as the program is unable to identify strategically significant knowledge assets and prioritise their management. Other direct costs are incurred when the knowledge that is managed is sub-standard knowledge, that is knowledge that is produced using sub-standard resources and processes. There is also the risk of excluding significant knowledge assets because you don't know they exist.

The information audit process presents librarians with an opportunity to use their professional skills to analyse and evaluate the information needs of their organisation, identify the information resources that contribute to business objectives and establish a foundation from which to develop a policy to coordinate and manage their organisation's knowledge assets.

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