Functions-based Classification of Records: Is it Functional?

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Functions-based classification is the development and use of a classification scheme based on what an organisation does - its functions and activities.[1] This approach is also known as functional classification[2] or business classification.[3] It was given prominence by the 1996 *Australian Records Management Standard (AS 4390)* and the subsequent *International Standard, ISO 15489: Information and documentation - records management*

(ISO 15489). Since then, functions-based classification has been strongly promoted.[4] Before this relatively recent change of focus, records were commonly classified by such characteristics as subject, organisational structure or geographical location.[5] Functions-based, or functional, classification has been strongly promoted particularly in Australia, Canada and the United Kingdom. However, its practice has raised a number of significant issues and dissent in the archives and records management community.

Part Two of this article is based on the findings of research conducted in 2004 and 2005, in which questionnaires were conducted of international groups of archives and records managers (experts and practitioners). The survey results in this article raise a debate embedded here within the context of wider archival and functions-based classification literature in the field. This article examines what functions-based classification is in theory, the experience of it in practice, and evaluates whether it is a practicable approach to classifying records.

Part One – Issues and debates around functional classification

Classification

Writing in 1956, Schellenberg expressed the view that 'classification is basic to the management of current records'.[6] In Australia in the same year, Ian Maclean wrote that classification, 'is the foundation of the study of modern records administration'.[7] However, until relatively recently, classification received scant coverage in the records management literature. There was more likely to be extended discussion of systems for physically arranging records.[8] Indeed, it has been suggested that records managers have misunderstood and misused the term classification.[9]

Early history of functions-based classification

The idea that records should be classified according to business functions is not a product of the late twentieth century. This approach has been used or described for over one hundred years.

According to Dr Ernest Posner, writing about registry practice in Germany:

> Since the eighteenth century there has existed a common agreement that the registry, corresponding to an agency or to a major division thereof, must arrange its holdings in

> accordance with the main functions of the administrative unit it serves.

However, he considered that functions and the organisational structure must coincide.[10]

Van Riemsdijk, a nineteenth-century State Archivist in the Netherlands, is seen as an early proponent of the value of understanding business functions when trying to understand records. In 1877 he suggested that archival documents 'reveal their nature and meaning best ... [when they are] placed in their natural and original context'.[11] This context was not limited to organisational structure but also included business functions and procedures.

In the early part of the twentieth century Arnold Van Laer criticised the practice in United States archives of classifying by subject matter or record type because the resulting record arrangements, 'fail to reflect the functions and activities of each body or office'.[12] He was promoting adoption of the 'principle of provenance'. From his written statements it seems reasonable to infer that he, like Posner, considered that functions and organisational structure corresponded.

Three significant figures in the development of thinking on records and archives in the twentieth century recognised function as an important characteristic of records. These were, in the UK, Sir Hilary Jenkinson and in the USA, Margaret Cross Norton and Theodore Schellenberg. However all, like the earlier writers referred to above, appear to have considered that organisational structure and business functions were closely aligned.[13]

Jenkinson wrote that 'the only correct basis of Arrangement is exposition of the Administrative objects which the Archives originally served'.[14] He later wrote:

> Archive series must always refer into to some Administrative Function, because without it they themselves would never have come into existence.[15]

However, in the same work he stated that the procedure for determining arrangement should be based on a study of the 'history and organization' of the body that held the records[16] and later made clear that he considered that the highest level of a hierarchical classification (what he termed a

class) should correspond to 'the division of office work which produced it'.[17]

Norton wrote that the top level of a classification scheme should be the agency or department,

> ... which made the archives part of its record ... Within departments there is a subclassification by governmental function represented, not by subjects.[18]

However, like Jenkinson she appeared to consider that organisational units coincided with business functions. In a paper presented in 1940 she wrote that, 'Archival classification is based upon departmental organization'.[19] In the same paper she famously stated that: 'It is a rule in government that records follow functions'.[20] This insight – that during a restructuring of government agencies, what is transferred between agencies are functions and the records relating to those functions – inspired a later generation who embraced functions-based classification and 'macro-appraisal'.[21] However, Norton was giving her aphorism as a reason why records should be classified on the basis of 'the present administrative organization' providing more evidence that she considered government agencies as always organised along functional lines.

Schellenberg considered that records could be classified by function, organisational structure or the subject matter of the records. However, in his view:

> as a rule, [records] should be classified according to function. They are the result of function; they are used in relation to function; they should therefore be classified according to function.[22]

He described a hierarchical classification of what an organisation did using the terms 'Functions - Activities - Transactions' (F-A-T) to label the layers (see Figure 1).

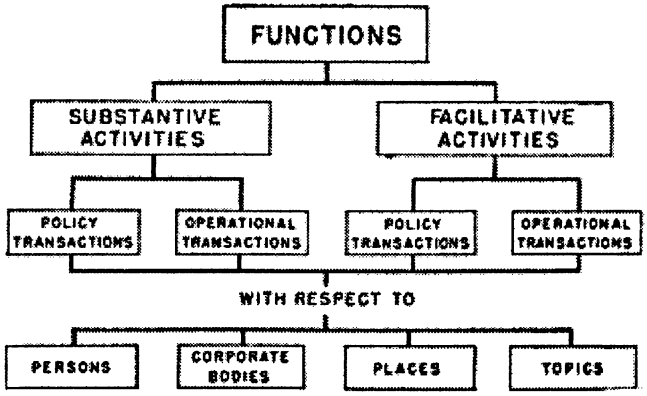

Figure 1. Schellenberg's F-A-T Model (from Schellenberg, 1956: p. 55)

However, like earlier writers he considered that:

> The organization that is given an agency is usually determined by the purposes or functions it is designed to accomplish.[23]

It is perhaps not surprising that these writers assumed a close relationship between organisational structure and function. This was at the time a common form of arrangement within businesses[24] and organisational structures were more stable than at the present time.[25]

A fundamental shift in viewpoint had appeared among a few American archivists in the late 1930s and early 1940s. Writing in 1940, Helen Chatfield, Archivist for the US Treasury, stated that the basis of records classification should be business functions rather than organisational structure. Unlike these earlier and some later writers she saw a significant distinction between organisation and function:

> If we really go back to the source of archival documents, we must go beyond the unit of organization in an agency to function, for the unit of organization is merely an instrument for the performance of function. If several units of organization work together in the attainment of a single objective, the records they engender should be regarded as a unit in the organization scheme.[26]

In the same year another US archivist, Dr Edward Campbell, gave evidence on classification by function to the Finding Mediums Committee of the US National Archives.[27] Campbell questioned, 'the assumption that all documents must be arranged under the administrative unit of the government which created or last made use of it'.[28] He pointed out that creating a classification scheme based on organisational structure required a great deal of preliminary study of administrative history. In his view this was inappropriate because the way people actually work and create records does not always neatly follow planned organisational structures. He also suggested that users of archives would need the same high level of understanding of organisational histories as the compilers of the classification schemes before they could locate records relevant to their research. He stated that these difficulties would be overcome if a functional approach to classification were adopted.[29]

The work of the Finding Mediums Committee led to the adoption of the 'Record Group' concept rather than a functions-based approach.[30] This approach was also used in Australian archives but was already being questioned in the 1960s.[31] Even earlier, Ian Maclean, after a working visit to the United States, wrote that records managers should be classifying, 'actions rather than ... information'.[32]

It has been suggested that following this early advocation of functions-based classification there was a loss of interest in the functional approach until the mid-1980s when functional analysis was used in the projects described below.[33] However, the topic continued to receive brief mentions in the intervening years.[34] Indeed Campbell's ideas were described as 'the most important' proposals advanced to deal with the classification of US archives.[35]

Functions-based classification since the 1980s

In the 1980s several projects were undertaken to use analysis of business functions to develop logical models of the functions of an organisation or discipline for appraisal and collection purposes.

In 1983 the Institute of Archives of the Massachusetts Institute of Technology (MIT) carried out a research study concerning the records of modern science and technology. This was an early example of 'documentation strategy'.[36] The group published a generic guide for

archivists structured around a classification of the activities and processes that are actually carried out within modern science and technology.[37]

In 1989 a closely-related approach was taken in relation to a specific type of institution, 'High-Technology Companies'. Like the MIT work this was based on analysis of functions. The analysis produced a list of seven top level 'business functions' which were serially arranged modelling a simplified process flow (planning; basic research; research development; production; marketing; sales; product support and enhancement). Each function was further decomposed into a number of activities.[38]

In another related piece of work, in 1992, a member of the MIT group published an analysis of the functions and activities of higher education establishments, again intended as an appraisal tool.[39]

Impact on records management

The focus of most of the writers cited above was primarily on records in relation to their custody in an archival institution. As suggested previously, records management literature gave relatively little guidance on classification as a topic and even less on functions-based classification. There is in an apparently isolated reference in a 1960s textbook suggesting the approach had been used in large institutions.[40] Textbook coverage of functions-based classification started to increase in the 1980s.[41]

Also in the 1980s writers such as Bearman, analysing issues raised by the increasing number of records in an electronic format, recognised the value of linking records to functions as a means of preserving their context and evidential value.[42] Bearman influenced Australian thinking and the development of the records continuum theory in Australia was focused on the primacy of context.[43]

In Australia classification was being seen as more than an aid for filing and finding. It was seen as the core of a system to control records as evidence. The Director of the State Records Authority of New South Wales described the following possible uses of a classification scheme:

- Developing thesauri.
- Titling and indexing records.
- Records appraisal and disposition.

- Storage and handling decisions.
- Access control.
- Determining what records need to be generated to document the work of the organisation.[44]

The 1996 *Australian Records Management Standard, Records Management Parts 1-6 (AS 4390-1996)* unambiguously stated that best practice was to base a classification system on business functions.[45] It even defined classification on this basis as:

> The process of devising and applying schemes based on the business activities which generate records, whereby they are categorised in systematic and consistent ways to facilitate their capture, retrieval, maintenance and disposal.[46]

The subsequent International Standard, *Information and documentation – records management – Parts 1 & 2 (ISO 15489: 2001)* was based on the Australian Standard (AS 4390). However, although it embraces functions-based classification it does not suggest that it is the only way to classify records. It defines classification as:

> systematic identification and arrangement of business activities and/or records into categories according to logical structured conventions, methods and procedural rules represented in a classification system.[47]

Despite this broad definition, the Standard also states that 'Classification systems ... are normally based on an analysis of the organization's business activities'.[48] The design and implementation methodology for records systems described in Section 8.4 of the Standard also gives clear support for functions-based classification.

Since the appearance of the Standards, the Australian Government has been promoting functions-based classification as a key component of recordkeeping systems.[49]

The Government of Canada has also been moving to a functions-based approach for all public records.[50] Their planned cross-government classification structure is known by the acronym BASCS (pronounced 'basis') which stands for *Business Activity Structure Classification System.*[51]

In the UK, since the late 1990s, the National Archives, formerly the Public Record Office, had promoted functions-based classification in relation to electronic records.[52] More recently it has slightly modified its approach and recommends a hybrid as opposed to a pure functions-based approach.[53] Recent UK textbooks on records management promote functions-based classification as the only[54] or principal[55] means of classifying records.

The Australian and the International Standards have not made everyone adopt functions-based classification as the only approach. The second edition of an Australian textbook *Records Management*, written after the appearance of AS 4390, recognises functions-based classification but is less dogmatic than the Standard's authors. The authors recognise that records can be classified by other characteristics, 'such as originating department, or by the subjects dealt with in the records'.[56]

The Association of Records Managers and Administrator's (ARMA) journal recently contained an article on classification, which contained 'function' as one of five bases of classification schemes and gave only a passing reference to ISO 15489.[57]

Methodologies

Broadly speaking two approaches have been advocated for the development of a functions-based classification scheme:

- Top-down analysis.
- Systems (or process, or business) analysis.

The two techniques can be used together.[58]

An early example of the top-down approach was the work of the MIT team looking at the records of science and technology.[59] The approach has been referred to as functional analysis.[60]

One of the products of the Pittsburgh Records Project in the 1990s was a draft methodology for developing a functions-based classification.[61] This was used in turn as the basis for the methodology put forward in the Australian Standard, AS 4390.[62] The methodology was expanded by the State Records Authority of New South Wales and was given the acronym DIRKS which stood for 'Designing and Implementing RecordKeeping Systems', The DIRKS methodology was subsequently adopted and promoted nationally by the National Archives of Australia.[63]

The first two steps in DIRKS, A and B, lead to the production of a logical hierarchical model of functions or 'Business Classification Scheme'. The method principally involves analysis of data collected from documentary sources and interviews. It notes that process analysis is also a useful method of identifying functions.

Systems or process modelling employs techniques developed by systems analysts.[64] One of the values claimed for models produced by these techniques is that they, 'depict precisely when, where and how records creation occurs'.[65]

The term process is used in this context to describe what happens in the transformation of input into an output. Each process is a mini-system that can be broken down into sub-processes and sub-sub-processes.[66] Rosemary Rock-Evans uses process as a synonym for function or activity.[67] Rick Barry, discussing electronic records, appears to use it in a similar sense when he describes 'core business processes' linking directly to a business' central purpose and 'support processes'.[68] The word process is not used solely in this sense in records management. A process has also been described as a grouping of activities cutting across the vertical hierarchy of functions and activities.[69]

In analysing a 'system' such as a whole business, its work can be represented by several levels of decomposition. Each process in the top level could be decomposed and so on until you reach basic transactions.[70] The processes and their sub-process have a parent-child relationship. It is a small step from this to developing hierarchical arrangement of activities. There is a clear link between a hierarchical arrangement of processes and sub-processes developed by this means and the hierarchy of functions and activities discussed above.

Structured systems analysts have well-developed and well-used methodologies and techniques to model processes employing DFDs or Data Flow Diagrams.[71] Their analytical approach has been adopted as a technique for creating functions-based classifications for records. Jeff Morelli, based in the UK, developed an approach that drew on Ed Yourdon's techniques to develop a methodology for developing retention schedules and subsequently for business classification schemes.[72]

Indiana University carried out a large-scale electronic records project in the early part of this decade under the direction of Philip Bantin. During the first phase they had developed a top-down methodology for designing

new recordkeeping schemes. Bantin was not satisfied with this methodology and it was reviewed. The revised methodology used the techniques of systems analysts such as Tom DeMarco.[73] Bantin considers that these techniques are an 'essential skill' for archivists and record managers.[74]

The Canadian BASCS approach recommends finding existing business process models wherever possible or to work with an expert business process analyst. Their approach is based on identifying sequenced activities.[75]

Shepherd and Yeo present a methodology using both top-down and process analysis. It involves designing a logical model of the business using a variety of techniques and then designing classification schemes for a part of, or for the entire, organisation.[76]

What do functions-based classifications look like?

Functions-based schemes are generally described and illustrated as a hierarchical classification of functions similar to Schellenberg's 1956 model shown in Figure 1. Relationships can either be displayed as a 'tree' structure or an indented list.[77] Alternatively it can be shown as an alphabetical list with the relationships between levels indicated by thesaurus terminology such as 'broader term' or 'narrower term'.[78]

A distinction has been drawn in the Australian DIRKS approach between a conceptual map of the functions of a business, referred to as a Business Classification Scheme (BCS), and the practical tools actually used to classify records. The tools derived from the model are the hierarchical 'record classification scheme', also known as a record plan or a file plan, and the functions thesaurus.[79] The BCS is a pure functions-based classification whereas the user-facing classification tools can be hybrid and can include at the third level or below: 'a mix of transactions, subjects or record types based on the most appropriate way to title the record for searching or retrieval'.[80]

This distinction between a conceptual model of what a business does and more pragmatic classification tools appears in the guidelines published with ISO 15489[81] and in Shepherd and Yeo[82] but is not ubiquitous in the literature of functions-based classification. In the UK National Archives guidance the term 'Business Classification Scheme'

is used to describe the classification tools themselves.[83] In the remainder of this article the term Business Classification Scheme or BCS will be reserved for a conceptual model of business functions.

Shepherd and Yeo describe an alternative way of classifying electronic records that exploits the functionality of computers. In this approach, the paper paradigms of folders or files are avoided. The elements derived from the functional analysis are put into an authority file, 'an electronic listing of the various functional levels'.[84] This provides the source for contextual metadata that is added to records at an item level to allow a more flexible, virtual, faceted classification.[85]

The two main classification tools are discussed below.

Functions thesauri

The term thesaurus is derived from an ancient Greek word meaning 'a store, treasure, storehouse, treasury'. It has been used in English to mean 'a "treasury" or "storehouse" of knowledge [such] as a dictionary, encyclopedia or the like'.[86] Roget used the term to describe a work which grouped words by the ideas they expressed in order to allow users to find appropriate words to articulate an idea.[87] Since the early 1950s the word has also been employed by information scientists to describe lists of controlled terms used to index and retrieve documents by their subjects.[88] A thesaurus in this sense displays relationships between terms, which may be:

- 'equivalence' relationships (between preferred and non-preferred terms)
- 'hierarchical' relationships (to broader or narrower terms)
- 'associative' relationships (between terms 'closely related conceptually but not hierarchically').[89]

An international standard, *Establishment and development of monolingual thesauri, (ISO 2788-1986)* exists for the establishment and development of such subject thesauri.

The term thesaurus has been used in records management since at least 1978.[90] Its use for a classification tool came later. A 'functions thesaurus' has been defined as: 'a list of ... broad and narrow terms which reflect the major functions and activities carried out by one or several organisations'.[91]

Functions thesauri are based on a business classification scheme.[92] They are a flat representation of the hierarchical business classification scheme with the relationships made explicit by indicators derived from ISO 2788. The implementation guide published as Part 2 of ISO 15489 states that a functions thesaurus should be constructed using ISO 2788. The thesaurus therefore acts as an index to the business classification scheme. Users, rather than browse a tree structure, can select any term and be shown its context or position in the classification scheme.[93]

Functions thesauri, in particular Keyword AAA, are widely used in Australia.[94] Keyword AAA was developed by the State Records Authority of New South Wales[95] and covers administrative terms. The top two 'levels' are derived from a Business Classification Scheme. The middle level contains two different types of element, one functional, (such as 'recruitment'); the other an abstract, generic, 'modifier' such as 'policy'.[96] The lowest level is reserved for 'subject' terms. The latter can be used with any activity. They reflect Schellenberg's 'with respect to' in Figure 1.[97] Guidance has been issued by the NAA on developing a functions thesaurus for operational terms.[98] As well as its use for classification, Keyword AAA is used as a controlled language for selecting consistent folder titles.[99]

Record plans

A functions-based record plan is a classification scheme displayed hierarchically. The higher levels are similar to those in a BCS, the lower levels may include subject or topic descriptors.[100] These lower levels permit the use of case files: 'a user may wish to keep many activities relating to a particular case or project on one file, for convenience and ease of use'.[101]

The following paragraphs discuss the detail of classifications based on either model.

Naming the levels

As noted above, Schellenberg labelled the levels in his classification model (Figure 1), Function, Activity and Transaction.[102] The two top terms in particular have been used in a variety of ways in the literature. Schellenberg helpfully defined the way he was using these terms and did not claim that these were the words 'essential' meanings.[103]

- Function: All the responsibilities assigned to an agency to accomplish the broad purposes for which it was established.
- Activity: A class of actions that are taken in accomplishing a specific function.[104]

Functions were therefore described as the link between concrete actions the organisation undertook and its high-level purposes.

The *Australian Standard* (AS 4390-1996) used the same three labels as Schellenberg. The formal definitions of function and transaction in AS 4390 are:

> [Function] The largest unit of business activity in an organisation ...
>
> [Transaction] the smallest unit of activity.

In other words, function and transaction are defined in terms of a hierarchy of activities; function is merely the label for the top level and transaction for the lowest level in a hierarchy of activities.

The Canadian BASCS hierarchy similarly uses the terms functions and activities. Function is once again a label for the top level but it is not necessarily the highest possible level. It depends on where the analyst thinks it appropriate to start the classification.[105] Keyword AAA similarly does not use the highest possible level as the top function level.[106]

ISO 15489 uses the three-tier model. However it uses the word 'function' without definition implying that it has an essential meaning distinct from 'activity'.[107]

Imprecise use of terms such as function is not just a feature of records literature; it also appears in business textbooks.[108]

Systems analysts recognised the potential semantic issue and some have taken steps to negate it. Gerald Kristen avoided the term activity and used function, sub-function, sub-sub-function etc.[109] Rock-Evans dropped the term function and substituted 'activity' because:

> In reality, no single word exists in the English language to describe concisely the concept of 'what a business does', but activity is a better word than function which is too closely tied in many people's minds to user's jobs and organisation units.[110]

A leading US systems analyst agrees:

> It is too difficult to say with any assurance that some task or group of tasks constitutes a 'function'. In fact, I'll bet you can't even define the word function except in a purely mathematical sense. Your dictionary won't do much better – it will give a long-winded definition that boils down to saying a function is a bunch of stuff to be done. The concept of a function is just too imprecise for our purposes.[111]

Both Schellenberg[112] and Jenkinson[113] stated that subject was generally not an appropriate method of classification. It is generally clear that there is a difference between subject and function.[114] However, the way the words are used can confuse the issue:

> Sometimes [subject] ... means function or activity, sometimes the transaction that is the subject of a file, sometimes the event about which the department is taking action, sometimes the abstract subject that is the subject of documentation.[115]

Number of levels

Although the National Archives of Australia's guidance suggests that a conceptual BCS should exist of three levels using Schellenberg's Function-Activity-Transaction model they do not suggest a limit for classification tools. Others too do not set a fixed limit. Writing from a records perspective Shepherd and Yeo state that the test is 'whether the work done so far will provide adequate control of records classification'.[116]

Yourdon, writing of systems analysis, considers that there would normally be from two to eight levels depending on the size and complexity of the system. He added: 'be extremely wary of anyone who tells you that all systems can be modelled in exactly three levels: such a person will try to sell you the Brooklyn Bridge'.[117]

Number of classes

Several works have either described functions-based classifications with relatively few groups at the top level or recommend this practice. Both Samuels, in her analysis of higher education institutes, and Bruemmer and Hochheiser, in their work on high-technology companies, described seven top-level functions. A project analysing the functions of the US

Congress described five.[118] Chris Hurley suggested that three to five terms should be adequate.[119]

Systems analysts favour relatively few elements at *each* level of analysis for reasons of usability. Yourdon, Checkland and Scholes note the findings of psychologist George Miller who concluded from experimental findings that there are limits on how much simultaneous information a human can process or make a choice from. (This number was generally found to be in the range of seven, plus or minus two.) Chunking information in the way described above breaks any 'informational bottleneck'.[120] However, others are either silent on this detail or use more elements. Keyword AAA has seventeen top-level terms to describe just the administrative functions of an organisation.[121]

Labelling classes and sub-classes

Like the lack of agreement on the preceding elements of a functions-based classification, there is also no complete agreement on naming conventions of classes and sub-classes and there is relatively little supportive literature on the issue.

Structured systems analysts recommend that processes (equivalent to functions and activities) should be named using, ideally, a single strong active verb and a specific object.[122] Strong verbs are contrasted with:

> ... 'elastic verbs' ... (verbs whose meaning can be stretched to cover almost any situation), [which indicate] ... that the systems analyst is not sure what function is being performed.[123]

Shepherd and Yeo advocate a similar approach or alternatively the inverted form, 'Recruiting staff [or] staff recruitment'.[124] However, they suggest that at the top level of the classification the verb may be omitted. Examples provided in DIRKS use a similar convention.

Benefits of functions-based classification

A number of benefits have been claimed for functions-based classification and these benefits are summarized below.

Stability of functions

As shown, advocates of functions-based classification from an early stage expressed the view that the functional approach was preferable to an organisational one because what an organisation does is likely to be more stable than how it is organised to do it.[125] An organisational classification would probably have to be restructured regularly.[126] Although functions are likely to be more stable than organisational structures, they do evolve and change.[127]

Understanding the business

The research and analysis involved in developing a functions-based classification scheme is claimed to allow a records manager or archivist to gain a fuller understanding of the organisation that will in turn support more effective control of records that are, or should be, being produced as a part of, or to document, those business functions.[128]

Ease of classification and retrieval

It has been claimed that it is easier for users to classify records using a functions-based classification because the classification is based upon the activities users actually perform.[129] This presumes that the user understands their activities in the same terms used by the developer of the classification.

A claimed retrieval benefit is that such a classification should bring together information related to the same function or activity even if the functions and activities are scattered across organisational units.[130] Such a proliferation of copies of records circulated widely across an organisation can also mean that the records located in an organisationally-based arrangement 'poorly represent' what the organisation does.[131] The functions-based approach may therefore reduce duplication and scattering of records.

Provision of context to records

Jenkinson wrote, 'archives[132] are an actual part of the activities which gave them birth'.[133] This context is by definition an essential element of a record.[134] Linking records in a recordkeeping system to these business activities therefore provides valuable contextual information and is a necessary part of understanding records as evidence and information.[135]

Aiding appraisal and disposal

Proponents of macro-appraisal recommend appraising business functions rather than the records themselves, suggesting that it will allow a better permanent record of the organisation to be retained.[136] This would also allow records to be sentenced (ie retention decisions taken) at or before the point of creation - at a macro level based on what the business does.

Proactive management of records

It has been claimed that having a functions-based classification provides a sound basis for effective general management of records.[137] Morelli[138] and Bantin[139] consider that the development of conceptual models can replace traditional records surveys. The latter considers that, conceptual model building could be, 'the primary methodology for dealing with most of the issues the profession faces in attempting to manage records in automated environments'.[140]

A functions-based classification can also be used to highlight where records *should* be created in order to satisfy the evidential requirements of the organisation.[141]

Other Benefits

ISO 15489 presents a number of other benefits for functions-based classification schemes, presented as unelaborated statements.[142] These are explored in Part 2 and some are listed in Table 1 which appears below in the context of the research findings.

Issues with functions-based classification schemes

Even in Australasia the issues around functions-based classification have caused 'division, not to say strife ' in the recordkeeping community.[143]

Despite the prominence given to this approach there have been few publicised examples of functions-based file classification that have been successfully implemented. Records managers have described difficulties in developing such systems and user resistance.[144] As Bruce Symondson has stated: 'for recordkeeping, the best theory is no help if people can't apply it'.[145]

Keyword AAA has been subjected to particular criticism. It has been criticised by several writers because it is not a thesaurus in the generally

understood use of that term.[146] Bedford described what he considered to be a structural flaw in Keyword AAA. A middle (activity) term can relate to several broader and several narrower terms. However when some of these narrower and broader terms are linked together by a common middle term the 'chain of terms' does not make sense. Barbara Reed has called this the 'loss of context' problem. A BCS or record plan avoids this because it 'preserves the context of the terms by presenting the entire classification string'.[147]

An Australian case study found usability issues with a functions-based classification as follows:

- In only 52% of cases did users manage to identify the 'correct' top-level function to classify a document.
- Users found difficulty distinguishing between functions.
- Search terms preferred by users were based on subject (43%) rather than function (8%) or activity (20%).
- Experienced records managers did not get better results than inexperienced users.[148]

One strong supporter of functions-based classification considers that the subjectivity in creating classifications creates problems, stating that: 'The people who devise them think that they are logical and easy to use, but the people who use them see things differently'.[149]

Hurley asks a question that may be of fundamental importance in respect of usability: 'Is it our task, by observation, to discover and delineate what is there or to artificially construct an orderliness which is not real?'[150]

The UK National Archives guidance on classification suggests that 'a strict functional approach will not support case files well', and holds the view, presumably based on feedback from their government client-base, that 'users do not understand and like [functions-based file plans] because they are difficult to use'.[151] Sanderson and Robinson considered that the difficulties are related to fundamental challenges to the way people work.[152]

Usability issues probably go deeper than has been so far considered by records managers. Research has supported the idea that users do not like to adopt 'logical' strategies for finding information.[153] Others,

investigating the human-computer interface, suggested that, 'many users ... are not willing to expend the effort to classify files'.[154]

An issue for those developing schemes has been the significant time and resources required to carry out an effective analysis of functions required to construct them.[155]

Part Two - Research findings

As mentioned previously, Part Two of this article is based on the findings of research conducted in 2004 and 2005 on theory and practice of functions-based classification of records.

Methodology

A primarily, but not exclusively, qualitative approach to research was adopted because of the need to gain an understanding of 'meanings, beliefs and experience' of the group.[156] The techniques used to obtain relevant data were: a review of the literature; a Delphi study to obtain the views of experts in Europe, North America and Australasia, and a questionnaire survey of a separate sample of records management practitioners in the same continents.

Both the expert and practitioner studies involved the use of questionnaires to obtain the research data. The experts' questionnaires and to a lesser extent the practitioners', contained a number of statements that had been made about functions-based classification in the literature. To enable comparative analysis, recipients were invited to record their level of agreement or disagreement with the statements using a Likert scale (measuring depth and intensity of attitudes - a simple statement of agreement/disagreement would not have captured this).[157] To obtain more in-depth data on the opinions of experts, a free comments field was appended to each statement. The total comments made by the experts alone amounted to over 20 000 words.

Delphi study

Expertise in the theory and practice of functions-based file classification is not limited to one country and is reflected in the scope of the literature review. There is particular interest and activity in Australia, Canada and the United Kingdom. Expert opinion appeared to be, sometimes subtly, divided on this topic. To explore the views of these geographically

widespread experts, the Delphi method was selected. This was developed in the Rand Corporation in the 1950s for use in the military and a broad range of industry.[158] Although Delphi was first used for forecasting, it has been used subsequently as a means of obtaining expert views on complex problems. In the view of Linstone and Turoff, 'there are few areas of human endeavour which are not candidates for application of Delphi'.[159] The Delphi method has already been used in areas of information management.[160] Using the Delphi approach allows the researcher, at relatively low cost, to obtain the views of experts from widespread locations and removes many of the pressures of face-to-face contact.[161]

In a classic Delphi study, several rounds of iterative discussion are employed. Feedback from an initial questionnaire is digested and fed back to the panel of experts who may then modify or confirm their views. Consensus is not a necessary outcome.[162] A computer-based approach was adopted because it was considered likely to be more convenient to users and the researcher. Members could join in when they wish and only contribute to those aspects they feel best able.[163]

The selection of experts needs to be carefully managed, not least to guard against 'illusory expertise' in the area being researched.[164] The criteria established were that the experts should be in one, or ideally more, of the following categories:

- Present or past academics in the field.
- Present or past members of archival institutions with experience in the area of classification.
- Authors of professional published works or contributors to records management or archival journals.
- Experienced and respected consultants in the field.
- Members of national or international standards committees relating to records and archives.[165]

A total of thirty-six experts from Africa, Australasia, Europe and North America were contacted. Of these, twenty-nine agreed to take part in the study and were sent Round One questionnaires. A total of twenty-three people participated. One further round took place. The participants came from Australia, Canada, The Netherlands, The United Kingdom and the

United States. The majority (83%) of the expert group met more than one of the criteria; five met all.

An interesting aspect of Delphi is that contributors are normally anonymous in order to promote opinions being freely expressed and to avoid peer pressure.[166] However, anonymity is not an essential element[167] and it has been suggested it could lead to a detrimental lack of accountability for what is said.[168] One participant, Jeff Morelli, said that he wanted any comments he made to be ascribed to him if they were quoted.

Analysis of the responses took place after the Round One process. Analysis included synthesis of views and differences of opinion. The responses were also analysed in relation to the users background, including country, to identify any patterns. Feedback was provided to allow respondents to confirm, amend or supplement their views or the researcher's synthesis.

Feedback and a small number of questions for clarification or comment were issued as Round Two of the study. Some participants responded but there was negligible change from the original responses. The Delphi was terminated at this stage.

Practitioner study

There appeared to be little structured data available in current literature on record managers' real world experiences of functions-based classification. To obtain this information, questionnaires were used. Because the literature indicated that the functions-based approach was being applied particularly in Australia, Canada and the UK it was decided to limit the sample to these three countries.

A provisional list of record management practitioners in the UK and Australia who had practical experience of functions-based classification was drawn up. This consisted of individuals either known by the researcher to meet the criterion or who had publicly stated (in the literature, on listservs or at conferences or presentations) that they had practical experience of this approach.

In the United Kingdom fifteen records managers who were thought to have undertaken work in this area were approached. Of these, nine (60%) took part. A fortuitous visit to Australia during the research allowed the

researcher to ask delegates attending the 2004 conference of the Records Management Association of Australasia (RMAA) and the Australasian TRIM™ User Forum 2004[169] for volunteers willing to participate in the research. Twenty-three originally agreed to participate. Fifteen of these (65%) actually took part.

In Canada the sample was selected from lists of email addresses on websites of Canadian chapters of the Association of Records Managers and Administrators.[170] The response rate in this case was extremely low. Of forty-seven emails sent out only one questionnaire was returned (2%). The full practitioner sample size was therefore twenty-five.

Expert opinion

The expert group in the Delphi study were presented with a series of statements, mostly derived from the literature, and were invited to record the extent of their agreement or disagreement. They were also given the opportunity to comment freely on each statement. Except where indicated, there was no significant correlation between views expressed and country of origin.

Overarching issues

A large majority (83%) appeared to agree or strongly agree that functions-based classification was the only effective way of classifying records. However, analysing the expert's comments, those who disagreed were challenging that this was the *only* effective way of classifying records. A number of those who agreed or strongly agreed stated that although this is generally the most effective way of classifying records it is not the only effective way. Taking these comments into account half agreed with the statement and half disagreed. Three of the experts made the point that functions-based classification was valuable because it facilitates long-term management of records. However, the needs of users to access information would require other classifications or views to be available.

A majority (69%) considered that provision of context to records is the primary purpose of classification. Comments made by those agreeing included the point that classification does not provide all contextual information and that context is not an end in itself, 'it enables appropriate controls to be applied'. Once again, those disagreeing or neither agreeing nor disagreeing were contesting the term 'primary'. Six people stated

that context was not an end in itself. Its value arises because it provides users of recordkeeping systems to derive a richer understanding of the records and also facilitates the application of controls by recordkeepers.

Approaches and methodologies

An overwhelming majority (93%) agreed, most strongly, that it is essential to create a conceptual model of business functions (a BCS) before classification tools such as record plans or thesauri. Five people made the point that the value of this conceptual model was potentially far more than the creation of classification tools. It should be used as 'the primary source of authority for other control tools, such as retention and disposal, security and user permissions, distribution ... It can be changed without fundamentally disturbing the other tools'. A point made in disagreement was that it could be a waste of time to do this if the only outcome of the effort was the production of a very similar classification tool such as a record plan.

The experts' views were sought on which approach, top-down decomposition or process analysis, is the *most* effective means of identifying the functional hierarchy. Nearly half indicated they were both highly effective. One described them as 'nested analyses'. Agreeing with this, several stated that a top-down approach must be tempered by some degree of bottom-up analysis, to verify the analysis against the real world. On the same point, two others stated that anyone undertaking such analyses should always keep in mind how records would actually be used.

Only a minority (39%) agreed with the statement that a proven methodology exists. Most who did agree mentioned DIRKS but only three of these made an unqualified claim that it was a proven methodology (only one of these three was from the home of DIRKS, Australia). One expressed the view that there is 'room to improve the quality and quantity of [DIRKS] support advice and documentation'. Another Australian, undecided, stated that DIRKS has 'worked in some instances (but by no means all). The successful adoption ... requires much work with ... the record creators'. In Round Two, one participant questioned whether any methodology could be proven absolutely, adding that they had used several methodologies that 'worked in the circumstances of the case'.

Reflecting on what had worked well in practice, one of the participants, Jeff Morelli, said that the method he used based on Yourdon's systems analysis techniques produced a model of functions and activities that was then validated by users.

Those disagreeing that a proven methodology exists questioned whether any methodology was proven in the sense that it had produced classification tools that had a high level of user acceptance. One stated that there are some common steps involved but that 'methodology implies far more rigour than is actually the case'. Two experts considered that insufficient thought has been given to management of change issues. One wrote:

> The methodology ... should not be confined to identifying functions and activities. There is a wider issue of buy-in and changing work methods, which is critical. People have to see a benefit in using the system and it can't be so complicated and inflexible that they struggle to implement it.

Hierarchical classification schemes

The majority of the group (56%) appeared to agree or strongly agree that a hierarchical functions-based classification scheme was an effective user-friendly means of classifying records. However, all but one of these attached caveats to their response. These included the points that the system needs to be as simple as possible, expressed in terms meaningful to users and also that the latter are given adequate training. Those who did not agree generally questioned user-friendliness. Two members of the latter group considered that such a scheme should not be exposed to the general user. One suggested that for the user some degree of automatic classification or user-focused grouping together with a simple Google™ Desktop-like retrieval tool would make functions-based classification less of a 'burning issue'.

Sixty-nine percent agreed with the statement that top-level classes should directly link to an organisation's mission and purposes. However, several respondents expressed the view that such a level is too high to be of practical use. One expert agreed that mission statements are often 'unhelpful' but stated that it is for the analyst to 'devise a more objective statement' just as they do with the labels for classification groups. Another

added the comment that other administrative areas survived by demonstrating a link to the mission and strategic priorities of the organisation. The same link should be seen to exist in relation to information resources - a reason to relate them in the BCS.

Only 43% agreed with a statement that the number of top-level classes should be restricted between seven to ten. Comments include the suggestion by Morelli that having more than ten classes becomes unmanageable and that restriction enforces clarity of thought. Four people who disagreed with the statement considered that there should be as many as required, one stating that limiting the number led to vague terms. Another disagreed from a different viewpoint considering seven was too many and stated that, 'my hunch, backed up by quite a lot of practical experience is that the average organisation (which does not exist of course) has about five functions'.

Less than a third agreed with the statement that there is an ideal number of levels for a classification scheme. Most who did suggested numbers in the range of three to five. One expert in Round Two expressed the view that for a record plan to be comprehensible and usable it should not exceed five levels whilst this limit need not apply to the BCS. Several cited usability as a key factor in limiting the levels. The majority appeared to consider that it depended on circumstances.

Over two-thirds agreed that classes should be consistent and mutually exclusive. However, the point was made that this could be difficult to achieve.

A large majority (82%) agreed or strongly agreed that non-function terms should be used at lower levels of a record plan or BCS. However in Round Two, participants made it clear that their agreement did not extend to the BCS. One argued the need for compromise: 'If a record plan is to be a useful tool, it must be able to be used by people in the organisation - not just those associated with recordkeeping'.

Functions thesauri

Half of the group agreed that a thesaurus was an effective classification tool. Most made no comment but a few qualified their support ('If it is well designed and user-friendly'; 'If it is well constructed and presented'; 'If properly designed and used as an aid to retrieval rather than a burden'). One-third were uncommitted. Of these, two Australian experts described

recordkeeping thesauri as user-*un*friendly. Some questioned the use of the word thesaurus to cover classification tools. In the feedback from Round One, the question was posed whether the term thesaurus should be abandoned to avoid [semantic] arguments. Three participants responded agreeing with this statement. One added that they considered that this was not just to avoid arguments but also to avoid confusion since library-type thesauri may have a role to play in records management systems. One suggested the term 'functional keyword index' as an alternative. One expert stated that thesauri were 'essential to guide people to the right terminology ... [but] should never appear to users in their current ... format'. Several of the 18% who disagreed or strongly disagreed expressed similar reservations. It was seen as a weaker way of representing a hierarchical relationship because the relationships were not 'hard wired'. Another wrote: 'Unless the full context of the path back to the top term is maintained, then it is not really effective'.

All respondents from Australia and three others agreed or strongly agreed with the statement that ISO 2788 is not an appropriate guide for developing such a thesaurus. One agreed but suggested that some of its conventions may be useful in developing recordkeeping thesauri. Most of the group (59%) neither agreed nor disagreed, with half of these stating that they had no experience of using ISO 2788.

Naming practices

Only 35% agreed that there was an effective convention for naming the *classes* in a functions-based classification. However, this group did not agree on the convention. Three of those who agreed suggested the conventions:

- Action term - Functional subject noun (eg Recruiting Staff)
  or
- Functional subject - Action term (eg Staff recruitment).

Another proposal (by someone who disagreed that there was an effective convention) was: 'Agent-Action statement - function topic - target/ audience'.

One person wrote:

> The terms should be action terms that use plain English and avoid jargon as far as possible. The terms should also

> be 'future-proofed' as far as possible and meaningful both to internal users and external stakeholders.

Three of those disagreeing that there was an effective convention for the naming of class commented in various ways that people use the same term to mean different things and different terms to describe the same thing.

Nearly three quarters agreed or strongly agreed that there is no user-friendly practicable definition of the *levels* in a functions-based classification. One stated that simple rules are needed but that 'we need to understand the issues in some detail and complexity before we can write the simple rules'. Another suggested that the terms are relative: 'What is one organisations function is another's activity'.

Morelli, who strongly disagreed with the statement that there was an effective convention commented:

> The terms 'function', 'activity' and 'transaction' imply that there are only three levels ... possible (or desirable). In fact there may be many more levels.

Several experts considered that one could come up with workable definitions but considered that users could become obsessed about the meanings of the terms 'functions' and 'activities' rather than concentrating on the parent-child relationship. They recommended neutral terms, such as level 1 or level 2.

Benefits

A list of thirteen benefits claimed to result from the use of functions-based classification were put to both sets in the survey group (experts and practitioners[171]) and the members were asked to rate their agreement or disagreement with the claim. Some of these claimed benefits were taken from ISO 15489, others were from elsewhere in the literature. A list of the benefits and the percentage agreeing with the claim appears in Table 1 below.

Claimed Benefit of functions-based classification	Experts level of support	Practitioners level of support
1: Functions tend to be more stable than organisational structures	100%	56%
2: The evidential and informational value of the record is increased by linking the record to its business context and therefore to related records.	100%	36%
3: When an organisation is restructured or a work is transferred to another organisation it is normally a function that is moved. If records are organised functionally it is easier to transfer them.	91%	44%
4: It assists in determining security protection and access appropriate for sets of records.	87%	36%
5: Records can be sentenced (ie retention decisions taken) at the point of creation - at a macro level based on what the business does.	82%	44%
6: It helps in allocating user permissions for access to, or action on, particular groups of records.	82%	36%
7: Decisions on retention can be based on the relative value of business functions and will allow a better permanent record of the organisation to be retained.	78%	36%

Continued.		
8: A functional classification can be used to highlight where records *should* be created.	78%	16%
9: It assists in ensuring that records are named in a consistent manner over time.	74%	36%
10: It helps avoid duplication of records where functions are spread across several organisational units.	61%	24%
11: Because records are created as a by-product of business activities, users will find it easy to classify records according to functions and activities.	56%	24%
12: It assists in distributing responsibility for management of particular sets of records.	56%	20%
13: It assists in distributing records for action.	47%	20%

Table 1. List of Benefits claimed for functions-based classification and levels of support for claims

In every instance a significantly higher proportion of the expert group, as opposed to the practitioner group, supported the claim that these were indeed benefits. With the exception of Benefit Thirteen, these claims were supported by more than 59% of experts.

Two members of the group cautioned about placing too much emphasis on stability of functions (Benefit One), stating that functions can change, particularly at lower levels.

Everyone agreed or strongly agreed with Benefit Two, which concerned enhanced evidential value and few felt the need to add comments. One person agreed to this as a theoretical statement but considered that there was no real supporting evidence.

None of the survey participants disagreed with Benefit Three. Those who did not strongly agree made a number of points around the view that organisational restructuring is not always logical or at least does not follow a functional logic. Similarly the split may occur at or below the level of decomposition that had been performed in creating the functions-based classification.

Benefit Four (security) is closely linked to Benefit Six. Even those who agreed that functional classification assists in determining security protection had caveats. They mentioned the fact that at document level items relating to the same activity may well have different levels of sensitivity.

Some of those agreeing with Benefit Five about sentencing on creation added caveats such as: there must be the ability to override automatic sentencing; and there is a need to reflect an appropriate level of granularity - eg original contracts may need to be kept longer than related documentation. One person, whilst stating that this approach was necessary for digital records added 'we are not yet sophisticated enough in our systems for anyone to be confident of the decisions'.

Several people among the majority who agreed that Benefit Six was indeed a benefit stressed that they were agreeing to the fact that functions-based classification 'helps' access control as opposed to a total solution to access control. Others who disagreed that functions-based classification helps in allocating user permissions expressed reservations such as 'it could interfere depending on the access system used' and also that in an organisation with cross-cutting (matrix) teams it may be of little assistance.

One person suggested that the term 'appraisal' would have been more appropriate than 'retention' in relation to Benefit Seven. Another picked up on the word 'better', which was indeed too loose and should at the least have been qualified as 'better than approaches not based on the value of functions and activities'. In Round Two one expert stated that they were, 'increasingly doubtful that there is any recognisable standard by which some business functions can be said to have more 'value' than others'. Several notes of caution were added: 'How well it is done is a completely different question and an equally vexed one ... I see it as rather a pragmatic approach than an absolute improvement'. Jeff Morelli, disagreeing that 'seven' was a benefit wrote: 'Decisions on retention must

be based on the business purpose of the information. A business function may produce or use items of information with vastly different purposes'.

The point was made in relation to Benefit Eight (that a functional classification can be used to highlight where records *should* be created) that a classification could also help highlight where records *are* being created but not being identified in traditional surveys or audits. Another expert suggested that it is likely to be the conceptual BCS rather than a classification tool that performed the function of highlighting where records should be created.

One person who strongly agreed with the benefit of consistent naming (Benefit Nine) pointed out that this was a record plan rather than a BCS benefit. Another's support was based on the controlled terms in a thesaurus rather than using a record plan. One person who neither agreed nor disagreed expressed the view that it *should* assist but they did not have high expectations of the average user.

One person who agreed with the benefit of avoiding duplication of records (Benefit Ten) stated that the content may well be duplicated but the context could make each instance unique. A member of the large group who neither agreed nor disagreed suggested that: 'It may not help avoid duplication, but it should help avoid fragmentation of records in such circumstances'.

Benefit Eleven (about users finding classification by function easy) had the highest level of disagreement. Most of those agreeing or strongly agreeing had caveats, which had the effect of flattening out the differences. Several people made the point that, to be effective, the analysis had to accurately reflect functions using terms that people understood and that users required training and, often, a change of attitude to make this work. One person pointed out that for such a system to work, users have to understand the activities that they perform, implying that this is not always the case. Another participant similarly wrote: 'They ought to be able to [find classification by function easy] but forty years working with the sort of people who have to implement such a scheme does not give me much hope of success'. Two people, who did not agree with the claim, expressed the view that difficulties arose because users tend to identify with the part of the organisation they worked in rather than underlying functions.

Several people were not clear what Benefit Thirteen meant and the following supplementary information was provided to them. 'It assists in distributing records for action' is a claimed benefit in ISO 15489 and appears to relate to an environment where hardcopy mail is received centrally and the functional model is used to decide where the mail should be sent. The results are based on feedback following that explanation.

Practitioner's Experience

The twenty-five records management practitioners who responded to the survey questionnaire expressed views based on their experience of having used functions-based classification schemes. One of the Delphi sample (who therefore met the research criteria of an expert) also volunteered to contribute to the practitioner study. The questionnaires were broken down into sections indicated by the headings below. Except where indicated there was no apparent correlation between country of work and the views expressed.

Business Classification Schemes (BCS)

Fourteen of the respondents (56%) had created, helped create or used a BCS. Twelve of these were based in Australia and two in the UK. Five other UK practitioners had initially stated that they had developed a BCS but on investigation it appeared that they had used the terms BCS and record plan as synonyms and had developed the latter rather than a conceptual model. One stated that the distinction only became meaningful when they started to develop an electronic records management system.

Methodology for functional analysis

Nearly two-thirds of the group surveyed used an existing methodology to develop the BCS and in all but one instance this was DIRKS. All of these practitioners were based in Australia. The other, based in the UK, used the method developed by Jeff Morelli (referred to previously).

Five (63%) of the DIRKS users found it easy to use the methodology. Two considered it was difficult and the other two neither liked nor disliked it. However, the majority (71%) would recommend or strongly recommend the methodology to others. Only one DIRKS user would not recommend it commenting that it was too complicated. Two DIRKS users, whilst recommending the methodology, commented that was time consuming. The user of the 'Morelli' methodology would recommend it to others.

Of the five people who did not use an existing methodology, two were from Australia and three were from the UK. All but one used a form of top-down functional analysis. Only one liked the methodology they used; the others were neutral. Two commented that the process was time consuming. Two Australian practitioners wrote that it had been difficult to get users they had consulted to think in terms of functions.

Resource implications

The majority (71%) of the practitioners had completed the BCS. On (mean) average it took 110 days. This average was skewed by one large result, 300 days. The median time taken was 80 days. All the figures for time taken were approximate.[172]

From the size of organisations, there appeared to be no correlation between the size of the organisation and the amount of time it took to complete the BCS. Size of organisation is of course only a very crude indicator of the complexity of its functions.

Views on the BCS

All the practitioners who had a BCS would recommend their use to others. When commenting on this, 36% said that it helped them understand the organisation better, one adding that it was an essential foundation for effective recordkeeping. The same proportion said that it assisted in ensuring consistency in classification.

Twelve of those who had a BCS had gone on to develop record plans. Five had developed functions thesauri.

Record Plans (Record Classification Schemes)

Twenty of the respondents (74%) had created or used record plans based wholly or partly on business functions. Nine of these were based in Australia, one in Canada and nine in the UK.

Only seven of the twenty said that they had used an existing methodology to develop the record plan. The methodology was DIRKS or, judging from the description, a very similar approach. Most of these described the methodology as easy or very easy to use although one said it was only easy because they had missed out the 'onerous' bits of DIRKS. Two thought that it was difficult because it was difficult discussing functions with users because they did not think about their work in that way. Five

out of the seven would strongly recommend the methodology to other records managers.

At least five other different approaches to DIRKS were followed for implementing record plans.[173] Most (54%) of these practitioners considered that their approach was easy or very easy. The rest were uncommitted. The majority (62%) would recommend or strongly recommend the methodology they used to others.

There was no common pattern to the record plan structures. The number of functions at the top level of record plans ranged from three to two hundred plus. The median range was twenty-one to thirty. There was no discernable correlation between the number of top-level functions and the size of the organisation.

In 85% of cases there were fewer than six levels in the record plan. The median number of levels was four and the range was from two to 'more than nine'. Fifty-five percent of record plans had included terms that did not relate to functions and activities. In two instances the record managers commented that the organisational structure corresponded to functional structure.

Most practitioners (60%) said that they and other record managers within the organisations liked or strongly liked the record plan. In the majority of cases this was stated to be because they had been involved in the development. They were also asked about the reaction of general users. Only 35% said users liked or strongly liked the record plan. In one of these cases the practitioner commented that this was because the users had been closely involved in development of the plan. In the majority (55%) of cases practitioners stated that users neither liked nor disliked the record plan. The one practitioner who said that users disliked the record plan commented that they were starting to get used to it and were accepting it. None of the organisations had stopped using the record plan.

Functions Thesauri

Nine practitioners, all from Australia, had used functional thesauri. All of these had experience of Keyword AAA; eight were continuing to use it. Six had also developed a keyword thesaurus covering the operational functions of their organisation.

The majority (56%) who used Keyword AAA liked or strongly liked it. One-third disliked it and the remainder were neutral. Among the comments made by those who liked Keyword AAA were: 'It works', 'All the hard work has been done for us'; and 'It's easy to use'. Three people expressed concern that some of the terms were too vague.[174]

As noted above, six practitioners had developed a functions thesaurus for their organisation. Half of these derived it from the BCS, two used DIRKS and one applied the principles in ISO 2788.

All were still using the implemented thesaurus and most (80%) would recommend them to other practitioners.

Benefits and disadvantages of functions-based classification

Records managers were asked about the benefits and disadvantages of functions-based classification. The potential benefits to an organisation, as used in the Delphi Study, were listed and practitioners were invited to state whether they agreed that these were in fact benefits. Many added other benefits. The benefits and the level of support for these are set out in Table 1. The benefits have been ranked in order of support. Only one benefit was supported by more than half of the practitioners. The median level of support was 24%.

Similarly, practitioners were asked to comment on the same list to state whether or not these benefited *users* as opposed to the organisation. The percentage levels of agreement with the statement were even lower; the median level of support was 12%. Three practitioners (12%) stated that functions-based classification had no benefits for users. However, it is not clear why some benefits that received relatively high ratings would be perceived as having no benefit to users.

Fifty-six percent of practitioners said that there were some disadvantages to the organisation of using functions-based classification. These were:

- The cost in time and other resources in managing the change to this new way of working (20%).
- Confusion and time wasted caused by unclear terms (12%).
- Benefits can only be realised if it is practicable for users to keep records functionally organised – some records are not suitable (8%).

- Difficulties related to case files (4%).
- Usability issues give a bad image to records management (4%).

Finally they were asked to comment on the disadvantages to users of functions-based classification. Sixty eight percent noted such disadvantages. Some listed several.

- Users feel it is not intuitive (40%).
- Confusion and time wasted caused by unclear terms (12%).
- Users feel the time spent understanding the classification reduces their productivity (4%).
- Management of change issues (4%).
- Complexity (4%). This represents one practitioner whose record plan had over two hundred top-level elements.
- Moving from organisational approach creates sense of lost 'ownership' of records (4%).

Other Comments

Just under half (44%) of practitioners gave reasons for their decision to use functions-based classification. Sixty-three percent of these said that it was because it was recommended as best practice. The remainder reported that it was because their previous (organisational) classification system had been badly affected by organisational restructuring.

Conclusions

Functions-based classification is an approach with a longer pedigree than some people realise. There appears to be widespread support among experts and practitioners for the suggestion that functions-based classification is a valuable way of classifying records but it is clearly not the *only* method by which records can be classified.

Records are by definition dependent on context and classifying them by relating them to relevant business functions links them to an aspect of that context. Doing this is in such a deliberate manner is clearly more important in relation to digital records than those in paper format for reasons given in the literature.

It is, in the words of one of the expert group, a 'no brainer' that functions are more stable than organisational structures. However, this masks a fundamental fallacy that seemed to be apparent to some, probably all, of the expert group but may not be clear to all *practitioners* attempting to develop such a classification scheme. Organisational structures are vulnerable to change but at any instant they have a reality that is apparent to all users because they are a human construct. They exist and their elements are clearly labelled. This no doubt explains in part why many users prefer an organisational framework to classify records. The fallacy is that there is a 'natural' hierarchy of functions waiting to be identified if only the analyst applies the correct techniques. The reality is that even the organisational boundaries may be unclear and the task of creating a hierarchy only creates an artificial, if logical, model. It cannot be claimed to be an unarguable representation of the real world. This potential problem is compounded because the labels attached to classes are simply the best effort of the analyst and even if validated with current users may be meaningless to their successors. Last year's staff in Personnel Management are now working in Human Resources Management. Neither label is better or worse than the other but the one that is current may be claimed to be more 'intuitive' for users.

In effect, classifying records in this manner is simply attaching an item of contextual metadata to those records. Using the most basic definition of classification, digital records can be dynamically 'classified' by users employing any, or a combination, of the metadata attributes that have been linked to them. Such dynamic classification can clearly be used as an aid to retrieval.

Principles of classification

The classification schemes described in the literature or by experts and developed by practitioners do not have a standard look and feel. Some appear to breach the principles of 'classic' classification theory. In some cases this may be because, as the literature review indicates, the understanding of classification in records management has not been as well developed as in library science. It seems a sensible approach for practitioners to understand and apply sound classificatory principles when developing a functions-based classification scheme.

The Australian model of a logical business classification scheme that is hidden from users and distinct from user-facing classification tools is

commended and supported by a majority of experts and also of those practitioners who have used this approach. It provides a logical model of what an organisation does, obviates records surveys or audits and provides an important tool for the effective management and control of records. This control tool could be used directly by recordkeepers to apply contextual metadata to records without involving users.

The means by which general users locate records in a recordkeeping system can be viewed as a separate issue and record plans or thesauri can be developed as a framework that is more pragmatic and synchronises with the way users work. Applying functions-based classificatory principles (at least at the higher levels) retains some of the benefits such as stability and allows standard application of business rules such as access controls and retention management, providing richer records without the need for users to add much metadata. Despite views that have been expressed, such an approach clearly supports the use of case files. Some other attributes users perceive as valuable attributes for filing and finding can be selected as metadata from Authority Lists.

There is no common model of a functions-based classification whether in the numbers of elements or levels or in respect of naming conventions. There is also no consensus on what the rules or guidance should be. Given that usability is a major factor in the use of such classifications it would be of value if such approaches as the '7+/-2 rule' could be tested in the field. The naming convention of 'active verb + object' appears a common sense and simple guideline. It has also been tested in the relatively rigorous world of systems analysis. Clear simple rules like this would be likely to benefit users and practitioners.

It would also be of benefit to practitioners and users if the way such terms as function and process, when used in this context, were standardised in any future revision of ISO 15489. The approach of those who have adopted neutral terms such as 'level 1' and 'level 2' could prevent possible confusion.

Methodologies

Some experts questioned whether any methodology could be said to be proven and indeed what the success criteria would be. It may be the case that a rigid methodology is not essential. Most practitioners, whichever methodology they employed, appear to have found it easy to use and

would recommend its use to others. However, the outputs of these methodologies were not examined and indeed, as noted above, there is no agreed model against which such schemes could be evaluated.

Top-down functional analysis methodologies appear to be fairly basic. It is open to question whether they can be properly described as methodologies. They certainly appear to be an art rather than a science. Systems analysis techniques on the other hand have been widely used since the late 1970s and modified in the light of considerable experience. Such system modelling approaches examine what is actually happening rather than what is meant to be happening so are grounded and validated at the level where records are actually created. Both techniques, probably in combination, will have at least some value in analysing what a business does.

Benefits

The issue remains that developing a functions-based classification appears generally to be a time consuming process and this use of resource may need to be weighed against the benefits.

Functions-based classifications appear to have a number of significant benefits. However most of these appear primarily to benefit records managers (on behalf of the organisation as a continuing corporate body) and to the successors of user/creators rather than people working in the organisation at any one time. It is interesting that the experts appear more convinced of the benefits than the practitioners. The fact that benefits are skewed in this way provides more force to the argument that a BCS as a control tool should be hidden and pragmatic classification tools exposed to users. For an organisation to obtain benefits those commissioning or developing a functions-based classification need to clarify and justify those benefits. Adopting a functions-based classification scheme simply because it is recommended as 'best practice' without being clear why such a classification is needed is likely to contribute to an unfocused or even unnecessary scheme.

Usability

There are clearly usability issues with functional classification schemes and some have been mentioned in the preceding paragraphs. Some issues may be fundamental to the way humans interact with computers. Whatever the effect of that, the move from paper to electronic records

means users are being exposed to underlying recordkeeping frameworks to a greater degree than in the past. If general users are expected to classify records and browse a hierarchy of functions the classification will need to be rigorously checked to ensure that it is usable.

Functions Thesauri

There are a number of issues with thesauri when used for records classification. It appears widely accepted that functions thesauri are not thesauri in the sense that term is used by information science or in earlier senses. To avoid needless semantic arguments and increase clarity it would be helpful to users if the term were dropped in this context.

Keyword AAA has clearly split the records management world in Australia to a certain degree. In this small sample it had support from most practitioners but it has vocal critics. The loss of context problem is clearly an issue when using AAA to classify records - perhaps less so when used predominantly for title control. The problem appears to arise from the lack of contextual thread being hard-coded into the classification. This then exposes the fact that the second level terms are based on different classificatory bases.

Finally

The approach to classification based on functions and activities is practicable in the sense that it has produced classification schemes that have been judged satisfactory by some practitioners and users. However, it has a large number of issues that are discussed in the preceding paragraphs that need to be resolved and if not resolved may affect the widespread take-up of the approach.

Because a functional approach has clear benefits for the effective management and control of records as evidence of what an organisation has done and because the need for such evidence is likely to increase, particularly in a digital environment, more research would be beneficial if it leads to clarification of these problem issues. Case studies could be used to explore the response of users to such classification systems and their general interaction with recordkeeping. More in-depth evaluation of methodologies linked to an analysis of the classification systems they produce would also add much needed depth to our understanding of what works and what does not. The development and testing of alternative approaches, such as Shepherd and Yeo's suggestion of a virtual

classification based on metadata may provide interesting alternatives to current ways of thinking which may be constrained by the paper paradigm and provide a more flexible future for the control of records in the digital world.

Endnotes

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171 This is not to imply that practitioners are not experts in their field. The definition of expert for the purposes of the Delphi study is discussed earlier in the introduction to Part 2.

172 Personal experience, anecdotal information from practitioners not involved in the survey, and feedback from practitioners when this aspect of the research was presented in Australia and the UK suggests that many have spent far longer developing functions-based classification schemes.

173 These were: using the BCS as a starting point and customising it, in most cases with non-functional terms such as subjects or client names (6 practitioners); user workshops to identify functions by such means as brainstorming (3 practitioners); copying an existing record plan (2 practitioners); reverse engineering a functional thesaurus (1 respondent); a mixture of inventories and interviews (1 respondent).

174 Other individual negative comments made about Keyword AAA were: 'It should be configurable so that irrelevant terms are not displayed'; 'It should be kept as small as possible'; 'Even records management professionals have difficulty using it'; 'It works for records management professionals but not general users'; 'It is less relevant for non-metropolitan areas'; 'It isn't perfect but...'