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Contents

Foreword by Max Hebditch vii

Acknowledgements viii

Preface xi

Part 1 Chapters

- 1 Introduction 14
- 2 What is information in the museum context? 19
- 3 The users of information in museums 33
- 4 Managing information to make it accessible 43
- 5 A strategy for using information 68
- 6 Human resources in information management 78
- 7 Using today's technology to help the people resource 92
- 8 Procuring and installing a computerized information management system 108
- 9 Organizing and running a computerized information management system 120

Part 2 Case studies

- Case studies topic finder 138
- 1 BEAMISH: The North of England Open Air Museum 140
 - 2 Bradford Art Galleries and Museums 148
 - 3 Callendar House, Falkirk 151
 - 4 Ceredigion Museum, Aberystwyth 158
 - 5 Hampshire Museums Service 164
 - 6 The LASSI (Larger Scale Systems Initiative) project 170
 - 7 The Manchester Museum 176
 - 8 The Museum Documentation Association 181
 - 9 The National Maritime Museum 190
 - 10 The National Museum of Wales 210
 - 11 Norfolk Museums Service 214
 - 12 North Somerset Museum Service 223
 - 13 Portsmouth City Museum and Records Service 229
 - 14 The RAF Museum 232
 - 15 The Royal Commission for Historic Monuments of England 244
 - 16 St Albans Museums 249
 - 17 Scienceworks (Museum of Victoria, Melbourne, Australia) 252
 - 18 The Victoria and Albert Museum 259
 - 19 The Theatre Museum 279

Index 286

Managing information to make it accessible

In this chapter

- Who needs to use information, and how
- What museums can learn from other organizations
- Their special information needs
- How museums began managing information
- The impact of IT
- Methods and tools for managing information

Chapter 3 has shown the range of users of information, and has indicated the great variety of ways in which they need and wish to use that information. This chapter looks at what these needs and wishes imply for the ways in which museums should manage their resources of information.

In Chapter 2, we listed questions to which museums need to know the answers in order to survive. Answering such questions is essential in making decisions about what to *do* with information to ensure that everyone who needs it can get at it and use it, in ways that meet their needs and are congenial to them. (That is what information management for access means.) The first part of this chapter looks at the implications of the answers in this light; it also considers the common ground between museums and other types of organization, and identifies some features that are special to museums. In the next section, we take a step back in time, and consider the origins of information management in museums and elsewhere, to see what if anything remains valid, and what has been changed by modern developments – particularly those brought by the diffusion of information technology. The final part of the chapter brings all this together, by considering appropriate methods and tools for managing information to meet the needs of particular museums.

The vital information, its users, and what they need to do with it

This section looks at the various kinds of information which we identified in Chapter 2 (see pp23–27) as being essential to museums; for each, it lists the questions that the museum has to answer, the people to whom the answers are vital, and what they need to do in order to manage the information for the benefit of the museum.

Information about the collections

1. What is in the collections?
2. Where did it come from?

3 Where is it now?

4 What has happened to it since it came into the museum?

This is the most essential knowledge for museum directors, administrators, curators, registrars and conservators, and the registration standards of the Museums and Galleries Commission are designed to ensure that museums achieve it.

SPECTRUM, the Museum Documentation Association's standard¹ for documentation (GRANT/MDA, 1994) for museums seeking to meet the standards, outlines:

- The procedures that museums need to provide which will enable them to answer those questions
- The implications for how museums need to be able to use the information. The procedures cover: object entry; loans in; acquisition; inventory control; location and movement control; cataloguing; condition checking; conservation; reproduction; risk management; insurance management; indemnity management; valuation control; audit; exhibitions and displays; despatch; loans out; loss; deaccession and disposal; retrospective documentation. The examples which follow examine, for two of these areas, how people need to use information, and what that implies for information management.

LOCATION AND MOVEMENT. The people concerned with this aspect of the museum's work need to be able to:

1. Assign an object to its place when it enters the collections. That implies links with storage and display locations, and with the people responsible for them (it should be noted that at this point the *nature* of the links and the means used to create them are not specified; there are many factors which have a bearing on these decisions).
2. See quickly and accurately, from whatever form of record is used, where it usually is and where it is if it is not currently in its usual place. That implies:
 - Being able to look up all objects by name or by accession number, or by donor name, etc. and to go straight to the normal location
 - A means of ensuring that whenever movement takes place it is recorded on whatever form of master record is used.
3. See what is in any particular location (gallery, room or store). That implies being able to search under location name and to find there a comprehensive list of everything displayed or stored in that location.
4. See at a glance a summary of the movement history of an object, and move from that to related documents. That implies:
 - A master record which provides for these links
 - A system that enforces the recording of movement and of links between the record and such documents as correspondence, movement forms, etc.
5. Know who has been involved in moving objects. That implies a system

¹For more about SPECTRUM and its development, see the case study of the MDA, p181.

which enforces entry of the names of those who have done the actual moving and of those who have authorized it (Figure 4.1 on p46 illustrates the requirements).

CATALOGUING. This example is based on an actual analysis of information management requirements in an institution which was planning to acquire a new system. The analysis started, sensibly, by looking at how people carried out the essential procedures at present, what obstacles the existing system placed in the way of doing the job, and what features were therefore necessary/desirable in any new system.

The major problems identified in the existing system were:

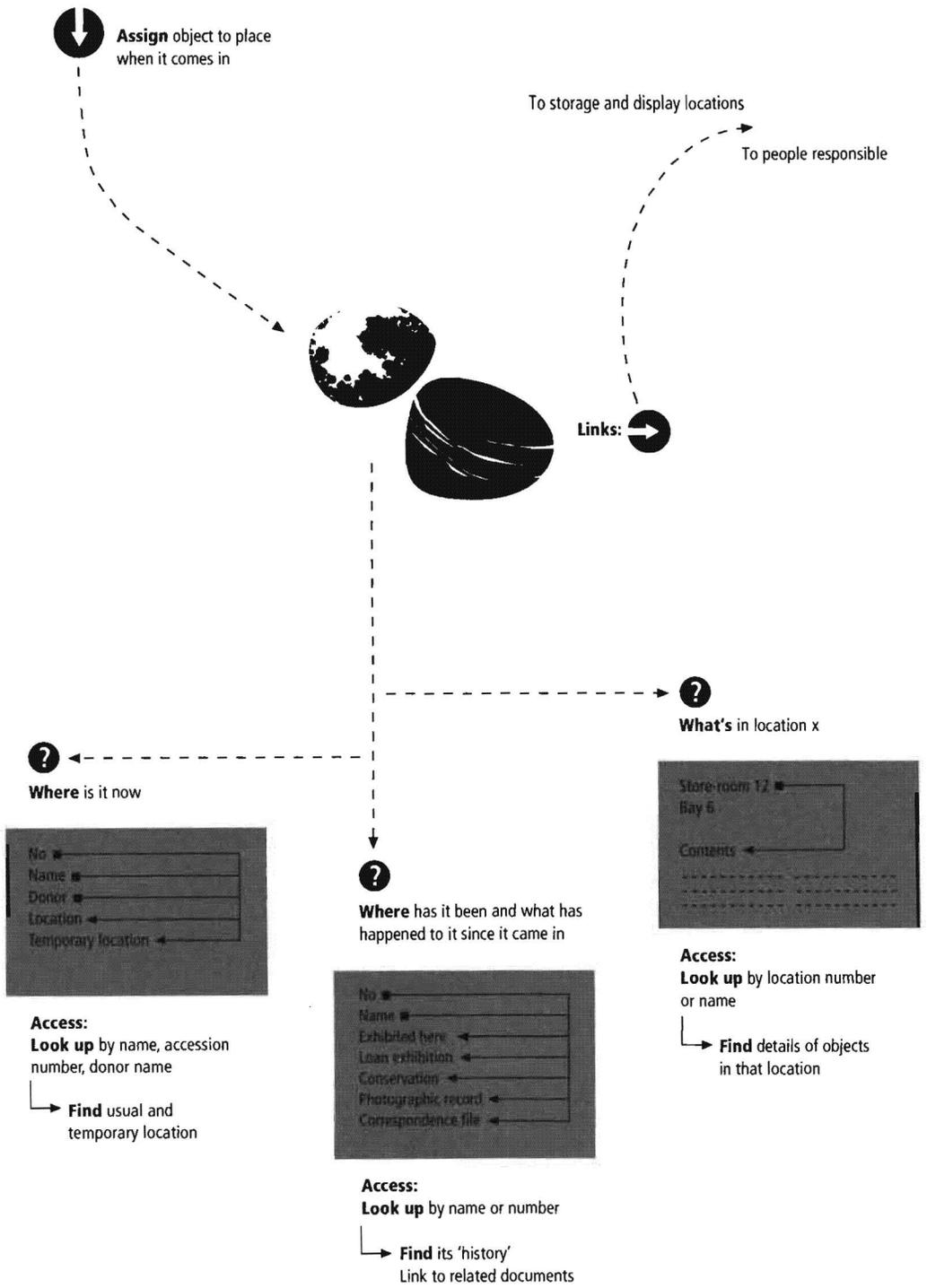
1. Catalogue records did not embody the history of items since they had come into the collections (e.g. movement, conservation, loans, photography).
2. Difficulties in indexing, partly related to the limited time available for getting to know and using the capabilities of the software currently in use, and partly to problems with authority files (deficient in some areas, and where they did exist not easy to access while creating catalogue records). The inherent richness of content of pictorial materials also created particular problems of indexing the collections of photographs and topographic prints.

The staff and the consultants working with them on producing a specification for a new system defined the main information management requirements in this area in these terms:

1. The system must allow development of a master catalogue record embodying the total history of items within the institution.
 2. It must permit the derivation from the master record of records needed for such special purposes as conservation.
 3. It must make it possible to treat cataloguing and indexing as a single operation: cataloguing recording factual information about items; indexing adding value based on curatorial knowledge.
 4. It must support software which helps build and maintain authority files.
 5. It must be possible to hold standards and authority files on-line and to consult them without moving out of the cataloguing and indexing module.
 6. It must be capable of automatically converting non-standard data elements into standard forms.
 7. It must be capable of adding to place or area names in a record the relevant grid references as index terms.
 8. It must provide the facility for adding images of items to catalogue records.
- For examples of system specification, see the case studies on Beamish p140, LASSI p170, the National Maritime Museum p190, the RAF Museum p232 and the V&A p259.

Information about the people on whom the museum depends

1. Who are the visitors to the museum?
2. What do they do there?
3. What questions do they ask?
4. Who are the potential visitors?



Answers to these questions are essential for management, administrators, curators, research, education and display staff, and those responsible for publications. They need it in order to make sensible decisions about the use of resources to meet the needs of actual visitors, and to reach and draw in potential visitors.

The information management requirements are to:

1. Record the numbers visiting, and gather data on where they come from, why they came and their responses to their experience of the museum.
2. Record and index the questions put by visitors and enquirers and the answers given.
3. Record information about potential sources of new visitors, and about action taken to reach them.
4. Access the recorded information, collate it and create reports as a basis for policy decisions, e.g. on exhibitions, forms of display and access, publications, outreach activities. For examples of visitor surveys and other activities to gather information about the museum's public, see the case studies of the Ceredigion Museum p158, North Somerset Museum Service p223, and the V&A p259.

Information about the people whom the museum needs to influence

Knowledge about the museum's key contacts is required especially by directors, and by financial managers, as the basis for policy decisions on dealing with funding agencies, governmental and other organizations, and potential donors.

The information management requirements are:

1. A unified, authoritative, centrally managed base of information about contacts, and about the museum's interactions with them.
2. Agreed procedures for contacting and updating.
3. Access to up-to-date information on the museum's relations with all its contacts, to help in preparation for meetings, production of the annual report, decisions on approaches to contacts, preparation of bids for funding, etc.

Information about markets, competitors and collaborators

1. Who are the museum's suppliers?
2. Who are its 'competitors' and its potential 'collaborators'?
3. Who are its 'customers' and 'markets'?

This knowledge is needed by directors, financial managers, commercial and purchasing staff, as the basis for decisions on the use of resources, market initiatives and collaborative ventures.

Information management requirements include:

1. A unified, authoritative and centrally managed base of information about actual and potential suppliers of goods and services.
2. Access to information about specific organizations, businesses, etc, and about the museum's dealings with them.
3. Intelligence gathering about potential products, markets for them, and commercial collaborators (e.g. CD-ROMS of reserve collections for special-

interest groups and businesses specializing in their production and marketing), and about the activities of other museums in this field.

4. Ability to bring relevant information together and produce reports to aid decision making.

The museum's human resources

1. What knowledge and expertise do its staff possess?
2. What additional knowledge would be beneficial?

This information is needed by management and the personnel function for planning the best use of the museum's human resources, and for making decisions on staff development and training programmes.

Information management implications include:

1. Records of staff expertise and of training they have undertaken.
2. Ability to access these records in planning new developments, so as to make the best use of staff knowledge, locate people with appropriate skills, and identify new training and development requirements.

Information about finance to support the museum

1. What are the museum's present sources of funding?
2. What is its financial situation?
3. Where can it find additional funding?

Directors and financial managers need to know the answers as part of the basis for strategic planning. The information management implications include:

1. A centrally managed and accessible base of information about present sources of funding and about the museum's current financial situation.
2. Intelligence gathering about possible additional sources of funding.
3. Ability to bring this information together in planning approaches to seek funding for new developments, meet the requirements of fundings bodies.

Information about scientific and technological support

1. What areas of scientific knowledge does the museum need to keep abreast of?
2. What is the state of the relevant technologies to support its work?

The people with an interest in this area include directors, registrars, documentation specialists, systems managers, conservators and exhibition designers. The information management requirements are:

1. Provision for science and technology monitoring and intelligence gathering as a specific job responsibility.²

²This is something that is, rather late in the day, coming to be recognized as necessary by business: 'To ensure that they always get the most out of IT, companies need a ... team of technical experts to help them stay on top of changing technology, changing business needs, and the changing capabilities of ... IT providers ... Another of the team's primary responsibilities is to assess emerg-

ing technologies. New technologies ... may sound very tempting, but will the company really be able to take advantage of them? The answer is no or not yet in a surprising number of instances.' (Lacity *et al*, 1995).

2. Ability to access relevant information for use in decision making about IT strategies, use of interactive media, exhibition design, etc.

Integrated management of information

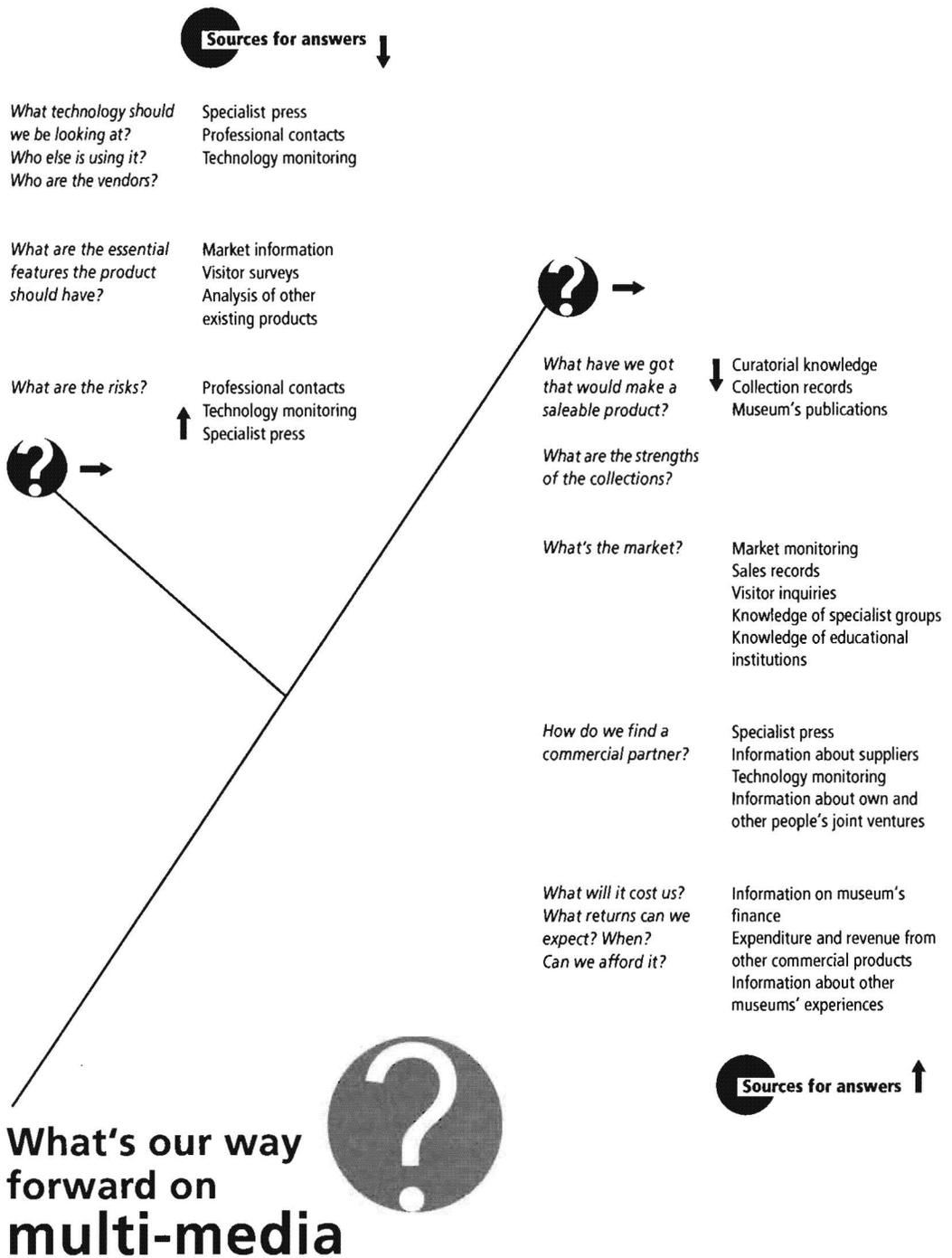
In addition to all these information management requirements for the many separate domains of museum activity, there is one more – that the interdependence of information from all the domains should be recognized, and that all the systems for managing their particular kinds of information should be able to work together to provide their users with information that creates a whole picture as a basis for sound decisions. For example, those planning revenue-raising multi-media products need to be able to draw on knowledge about the strengths of the collections, potential markets for the products, visitor information, the results of technology monitoring, information about potential commercial partners, and information about what the ‘competition’ is doing (see Figure 4.2 on p50). Specifications for new documentation systems need information not only about the current technology and the vendors – they cannot be properly planned without knowledge of the kind of questions which visitors, researchers and curators ask about the collections, and of the current procedures for managing the collections. Bids for funding for new developments are more likely to succeed if they can draw on information resources about the collections, the actual and potential range of visitors, the museum’s financial situation, the activities of ‘competitor’ or ‘collaborator’ museums, and the background of the individuals who will make the decision on whether to give funding.

It has to be said that this is a requirement which no museum, so far as we know, has yet managed to meet, and one of which many are not even conscious. The obstacles lie less in the potential of the current technology than in organizational culture and management structures (there is, however, some evidence that the process of specifying and starting to use modern collections’ information management systems is making the museums concerned see their potential for integrated information management). For examples of the effect of this process, see the case studies of LASSI p170, and the V&A p259.

Common ground between museums and other organizations

All organizations – including businesses and institutions of every kind – need to be able to answer a similar set of questions to the ones just posed in relation to museums, and to act appropriately on the answers in order to survive and prosper. They need to know the state of their resources – material, financial and human; they need to know about their customers, competitors and suppliers; they need to know the legal and quasi-legal obligations placed on them; and they need to keep a watchful eye on the economic, social and technological environment in which they operate.

While even the most intelligently managed and successful businesses are not much further forward than museums in the integrated management of



different kinds of information, museums can benefit when they appreciate the common ground. They can learn much about good practices that are standard in well-managed businesses, which can protect them against risk when they enter new areas – particularly commercial ones – and engage with new concepts in their own work. This is especially true of accountability, inventory control, risk assessment in relation to new ventures, and market information. Organizations like museums, to which the ‘market economy’ is a new and, to some, stimulating concept, are sometimes in danger of burning their fingers by embarking on risks that experienced businesses would not touch.

Areas with special requirements

In spite of the common ground with other organizations, museums are in some respects unique and special, and those special characteristics have a decisive role in decisions about information management.

In the first place, the objects which museums handle are mostly one-off, each unique in itself and distinct from others in the same category, in contrast to the printed documents which form the material resources of libraries, or to the products of manufacturing. (The significance of manufactured products to their manufacturers and to museums is indeed very different, and so is the approach to handling and recording them.) This has implications for the nature of the records that represent objects and the ways in which they are used. Although the kinds of use made of the records are not unique to museums (businesses need stock inventory, valuation, document management and mailing lists, for example), museum records need to allow for complexity of a kind that goes far beyond that of catalogue records for books, or of most records which other institutions or businesses need to maintain – in order to allow for all the things that need to be done as part of collections information management. In addition, museum records have the fairly unusual property of being open ended – there is always the possibility that new information about the objects they represent will have to be added.

The objectives of museums, whether formulated in detail or accepted by implication, also distinguish them from most other organizations. Besides the traditional safe keeping of the collections in their care (implicit in the job titles of ‘keeper’ and ‘curator’), and the more recent obligations of accountability and of providing ‘keys’ to their records in the form of indexes, many museums today place increasing emphasis on access of an interactive kind which in principle allows users to take initiatives in seeking information, and to choose their own ways through the ‘threefold store’ of objects, the information embodied in them, and the museum’s knowledge resources.³ See Chapter 2, p28. Meeting objectives which relate to access indeed provides some of the most interesting

³ There is a parallel here with enlightened thinking about business management. Norman & Ramirez (1993) suggest that the goal of modern

businesses should be ‘to mobilize customers to create their own value from the company’s various offerings’ (i.e. products and services).

challenges in information management. As Jones (1996) expresses it, 'We manage collections in order to make them accessible', and the particular characteristics of museums mean that the process of management requires a 'balance between control, care and access'.

Assisting access

As McCorry and Morrison (1995) point out, little research has been done on the questions actually asked in museums, whether by visitors or by those who work there. Their own analysis of a sample of about 1000 questions asked by visitors in 100 museums found that the most common enquiries were for information about specific types of object, or individual objects. Next came requests for 'associated information' on places or named individuals. Enquiries for objects with a particular subject content were most common in art galleries and museums with photographic collections, but represented a very small proportion of the total; so did those relating to physical characteristics of objects. This study provides some useful pointers to the 'ways in' which many visitors to museums seek, and so to some of the essentials that information management in the form of record structure should provide. McCorry and Morrison suggest, in the light of their findings, that: 'Since what, where, who, when comes out ahead and these are the questions that database management systems are good at answering, we should be looking at ways to standardize and simplify how we do this rather than worrying about nuances of description and setting ourselves impossible tasks of terminology control' (p7). However, their sample is small, and biased in the sense that questionnaires were sent only to people known to the authors, and it contains few examples of the questions which museum staff ask in the course of their work. Questions that remain to be investigated include: what 'ways in' are most important for museum staff? Are there other questions that people would ask if they thought they were answerable? What are the implications of access to information through images of objects (like 'thumbnail' images of pictures and photographs)? How should words descriptive of subject content and associations be used to give access to the images?

TERMINOLOGY AND ITS CONTROL.⁴ The question of terminology control is one that recurs in the case studies – it is a problem round which museums, and the Museum Documentation Association, have over the years performed a kind of dance with much advancing and retreating; and today there seems to be a

⁴ For examples of various approaches to terminology control, see the case studies on the RAF Museum, Falkirk Museums, the V&A, Hampshire Museums Service and Ceredigion Museum. Standards for thesaurus construction are published by the British Standards Institution (1985, 1987) and by ANSI/NISO (1993).

renewed movement towards it. For an account of recent MDA initiatives, see the case study on p181.

If we want all kinds of users to be able to use collections documentation for themselves, so that they can make their own decisions about what they want and find their way to it, terminology control is an essential tool. It is probably fair to say that when users seek to get into the museum's store of information as represented by whatever forms of access are offered to them, they would wish to be able to:

- Come in through their own particular concerns
- Move freely through the store
- See what it offers that meets their requirements
- Pick up the 'goods' they want
- Come out again with them quickly, ready to get on with pursuing their own interest, or move on easily to find new things.

By the same token, they are likely to be displeased by:

- Finding no way in that matches their own interest
- Being offered goods they don't want, mixed up with those they do
- Tedious sifting to find what they want
- Coming out empty handed.

The commonest cause for the negative experience is probably still the lack of enough 'ways in' – from collections which offer only an accessions list, and perhaps a donor index, to those which have a classification but no index to it (see below, p59). This is the problem identified 120 years ago by Antonio Crestadoro (1856) in respect of books at the British Museum library:

'How can an alphabetical Catalogue on the existing plan of joint inventory and index, or one entry and one heading, satisfy enquirers that seek the same book from different data, and for different purposes? ... Freedom is, in all things, an essential condition of growth and power. The purposes of readers in search of a book are as manifold as the names and subjects, or headings under which the book may be traced. Entering the book only once is giving but one of its many references and suppressing the remainder; – it is serving the purpose of one reader and defeating that of others. So far the book is withdrawn from the public, its light is extinguished and destroyed'.

If that particular obstacle is removed, by using technology that allows multiple ways in to the documentation – for instance by means of information-retrieval software that permits free-text search on multiple criteria – another is liable to take its place. The new difficulty arises from the sheer richness and variety of language. There are so many possible ways of describing things and of expressing concepts that, even when we have a tireless electronic slave that will find any word or phrase we ask for, what it brings us may be only a fraction of what is relevant, because some records which we would find useful don't contain the exact words we have asked for; or it may be quite irrelevant, because

the people who created the records used our words in quite a different sense from the one we intend.

To make words help rather than hinder the users of museum documentation, we need to help users to:

- Get from the words they use to all the things they need, whether the words they use are the same as the ones used in the records or not
- Find exactly what they want at the most precise level of detail they need, without having to sift through a lot of things they don't want
- Find everything relevant to a generally formulated interest, without having to guess at the detailed elements that make it up.

And we need to remind them of related things that may also be useful. These are the standard kinds of help that thesauri seek to give; they do it by providing a strongly structured terminology, with well-thought-out links between terms and guidance on using them.

The interesting and difficult question is what is the cheapest and most effective way of helping:

1. The people who create the documentation to use tools of terminology control to help the users?
2. The users to put their questions and take control in interacting with the documentation?

It will be noted that the *users* have to take control – it is the terminology that has to be controlled, not the users, and the mechanism of terminology control should be invisible to them; it should help them unobtrusively and never ever give them negative or incomprehensible messages. A conventional thesaurus in all its glory is an alarming sight, even for some information professionals, let alone non-specialists. We have to find ways of making its benefits available without revealing the works. Experience with making other kinds of information accessible to a wide public suggests that people untrained in information search find it reasonably easy to cope with a 'keyword out of context' index, based on a thesaurus, with very simple displays of related terms and more precise terms, which allows them to select any term – including non-preferred ones – and to go direct to the relevant records (Orna, 1986).

As to help for the people who create the documentation, more and better support than ever before is available to them today, both as part of total collection information management packages, and as stand-alone software to help in creating and maintaining thesauri. For examples of the use of software for creating and maintaining thesauri, see the case studies of Callendar House, Falkirk p151, LASSI p170, the RAF Museum p232, and the V&A p259.

Desirable features for thesaurus software:

1. It should allow you to integrate the building and use of a thesaurus with the creation of records.
2. It should let you link as many entry (non-preferred) terms as you wish to relevant index (preferred) terms, so that they can be used interchangeably. This means that:

- When you are creating records, the software will let you use any of the entry terms, and will index the record with both that term and the relevant index term
 - When any one of a group of terms linked in this way is input as a search term, the software will retrieve records containing any of the terms, starting from the ones where the term actually input has been used in indexing.
3. The software should allow you to set up authority lists for different fields, and to call up in a window the lists for different fields – e.g. periods of time or materials – as you are creating records. Then you should be able to scan through them and select those relevant to the record you are working on, so that the software automatically assigns them as index terms for it. For an actual example of a specification for thesaurus software as part of the operational requirement for a collections information management package, see the case study on the RAF Museum, p232.

Something else that is urgently needed is more off-the-peg smallish thesauri for specific subject areas, available in machine-readable as well as hard-copy form, which museums could buy and extend to meet their own needs, rather than facing the problem of starting from scratch, which usually means never starting at all. It is to be hoped that the MDA's project on terminology control will lead to such developments. See p185.

Another much needed development that is surely now almost within reach is a thesaurus that combines text and images, so that users can move from:

- Word to related image
- Image to related images
- Image to related words.

A backward glance – the origins of information management in museums

Before considering potential modern approaches to the information management requirements outlined in the earlier part of the chapter, it is worth reminding ourselves of the basic conceptual problems which have always confronted those responsible for managing any sort of collection. (This section draws on Chapter 2 of the first edition of this book – the lapse of time has not invalidated the ideas here!)

The central problem

'Those whose business it is to house and care for physical objects ... always come up against the inconvenient fact that an object can physically be in only one place at a time. This is inconvenient because, in order to be able to think about an object purposefully in relation to other objects ... it is necessary to bring together and manipulate the information content of the objects. This means finding some way of representing objects which allows them to be moved around freely, by proxy, as it were, so that they can be brought together in any way that suits the kind of thinking we want to do about them ... The problem is essentially one of getting the maxi-

imum freedom of access to the useful information ... at the minimum cost in terms of time, effort and money.' (Orna & Pettitt, 1980, pp6–7).

Moveable representations

The proxy for the objects themselves which was devised (initially by librarians) was the moveable representation in the form of records. It long ago became well-established practice to multiply the records and organize them in differently arranged sequences for greater freedom of access and more power for users – as in traditional card catalogues.

The pursuit of freedom and power led to consideration of two further problems: the content and structure of records, and the ways of gaining access to and manipulating the records for useful purposes – the 'keys' to the store of information.

Records

'The importance of the record cannot be over-estimated; it represents the object and so carries a central responsibility in any system of handling information. What has not been put into the record cannot be retrieved. Inconsistencies in the presentation of information in the record, for example calling similar objects at one time by one name and at another by a different name, or spelling the same author's name differently on different records, will lead to failures to find like objects, or to delays and confusions.' (Orna & Pettitt, 1980, p9).

The implications are that there should be careful thinking in the planning stage about the information content of records, and established and scrupulously observed rules and procedures for preparing them. This is the motivation for the librarians' Anglo American Cataloguing Rules, and for the intensive and necessary investment of effort by the Museum Documentation Association during its early years in developing cataloguing cards and rules for completing them. The need to think about record content and structure has not been superseded by any advance in technology so far.

'Keys' to the information store

Two powerful and complementary approaches to getting into the store of information represented by records had been developed by the end of the nineteenth century – one depending on a fundamental feature in the way the human mind stores and accesses its knowledge, and one on the simple fact that in literate societies there is fairly universal agreement on the sequence of characters in the alphabet. In other words: classification and indexing.

CLASSIFICATIONS. The idea of deciding the relative placing of things and the records representing them on the basis of grouping like with like derives from the oldest human principle of managing ideas in the mind. The biblical account of creation is of an exercise in classification, so too is the first occupation of Adam and Eve in Paradise in naming the creation, and Noah's embarkation arrangements for the inhabitants of the ark. As McArthur (1986) reminds us,

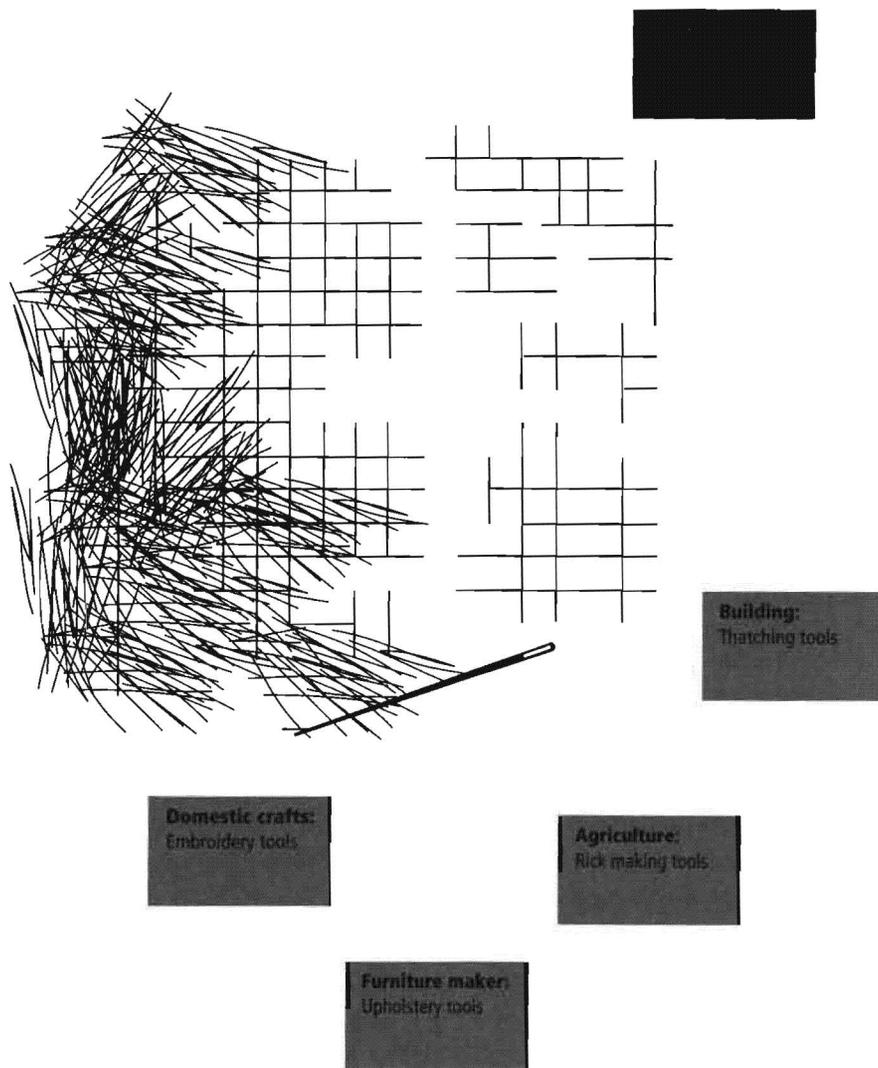
the 'taxonomic urge'⁵ was inherent in society from the earliest days: it got into its stride with the development of writing, and became the structural principle of the great compilations of knowledge of the ancient and medieval worlds, and of the Renaissance and Enlightenment.

But this noble principle has an in-built problem: by bringing groups of things together on the basis of one set of shared features, it separates individuals in one group from individuals in another with which they have other features in common (a problem quaintly known in library circles as that of the 'distributed relative'). A simple example makes the difficulty clear. If a social history collection in a museum classifies tools by the materials of the crafts in which they are used, tools of the same basic form which are used in different trades are separated from one another: a flint knapper's hammer from a silver-smith's, a thatching needle from an upholstery needle. So anyone who wants to compare the form of all hammers in the total collection has a long task. He will have to think of all the possible hammer-using crafts and go to the appropriate section of the classified catalogue and scan card by card, looking for hammers. (Orna & Pettitt, 1980, p16). Figure 4.3 on p58 illustrates the predicament.

The other awkward fact about human classifications is that, while we all classify from our earliest years, as part of learning to make our world manageable, we each do it in different ways, according to what we see as significant. That still doesn't stop people – even people in museums – from trying to make what they describe as an 'intuitive' classification the only principle of arrangement of records.

INDEXES TO COMPLEMENT CLASSIFICATIONS. From the realization of the in-built problem of classification described above came the development of another, much later, tool, the alphabetical index – a principle of arrangement which we owe to the early compositors who quickly found the advantages of sorting their types alphabetically. Even so, according to McArthur (1986, p77), 'it took more than 100 years after the advent of printing for alphabetization to establish itself as a serious and regular tool in the world of reference' and

⁵ McArthur argues that 'classification and thematization' are driving forces in the development of human society and culture: 'Classification and thematization have many forms, but the key forms appear to be only two: first, the making of categories or groups', and then the creation of a hierarchy ... through which to systematize the categories or groups.' (p34). For further insights into how we categorize see Edelman's (1992) brilliant study of 'the matter of the mind' – 'categories are heterogeneous in origin: the actual properties humans use to determine category membership are interactional and they depend on different biological, cultural, and environmental variables' (p236).



indexes became firmly established only around 1600. There is still an inherent problem in indexes, however: that of agreement between those who make them and those who use them on which words to use for specific things or concepts – the problem which thesauri seek to solve (see pp53–55).

The increase in power that could be gained from harnessing indexes and classifications together was probably not realized until the late nineteenth century when Dewey developed the ‘relativ index’ to his decimal classification, which he himself described (Dewey 1885) as ‘the most important feature of the system’. The combination is indeed one that gives the maximum power and freedom of access that can be attained in manual systems.

Libraries quickly learned the power of this double tool both for arranging items and records and for finding those which were relevant to particular requirements for information – developing the use of both indexes to whatever classification scheme they were using (‘indirect’ indexes), and ‘direct’ indexes to specific collections of information. Some museums followed their lead, but it is probably fair to say that the role of indexing as a complement to classification was not always appreciated (the comparative neglect of indexing was indeed one of the reasons for writing the first edition of this book), nor was the importance of consistent use of words in indexing. (See Figure 4.4 on p60, for an example from a museum classification.)

The trade-off: input effort vs ease of access

Table 4.1, on p61 and Figure 4.5 on p62 summarize the argument of the preceding pages and suggest the trade-off that exists between, on the one hand, investment in aids to finding required objects and, on the other, speed and success in the task.

The impact of IT

In 1980, it was possible to predict that specialized classifications would probably continue to be a useful intellectual tool to support thinking about collections, and that developments in information technology already under way would relieve some of the rigours associated with constructing and applying them, while the way into information handling through indexing would become the easier one. Events have more or less borne out that prediction.

Table 4.2, on p63, suggests what has remained unchanged, what has changed, and what has become less significant in information management thanks to the developments in the technology.

Choosing the methods and tools to manage information

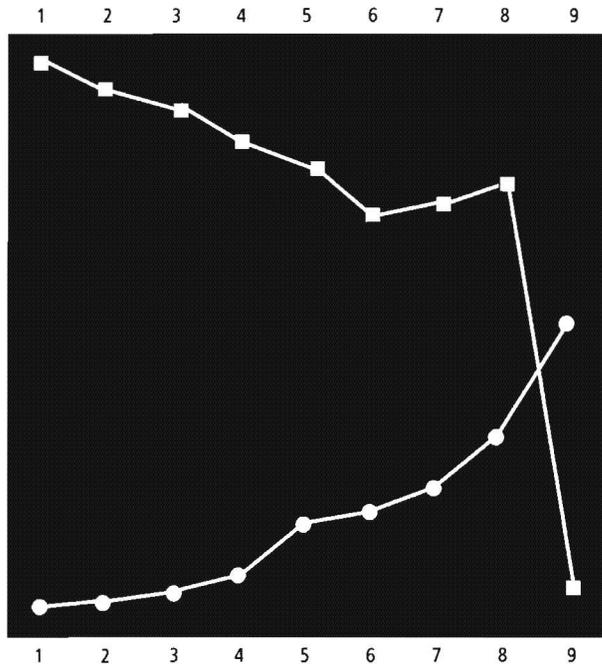
As the previous sections of this chapter have shown, the information needs of museums are many and varied, ranging well beyond the ‘simple’ cataloguing of their collections. Deciding on the best way of managing this information

Index terms	Notation	Classification
comb, pocket	3.54	Section 3. Personal Life 3.5 Toilet 3.54 Hair care eg Pocket comb
comb, tortoiseshell, manufacture	4.596	Section 4. Working Life 4.596 Ivory, Bone, Horn, Shell etc Products
combat jacket, military	1.81.41	Section 1. Community Life 1.8 Warfare and Defence 1.81.41 Uniform and Armour
combinations, men's	3.3242	Section 3. Personal Life 3.3 Costume 3.32 Men's 3.324 Underwear 3.3242 Combinations

Tools to help in finding them

What they cost the user

<p>1 Objects alone</p>	<p>No initial cost; go straight in; but it could mean a long walk</p>
<p>2 List of objects, with their locations</p>	<p>Low initial cost; scanning may take a long time; but a shorter walk Cheap to maintain</p>
<p>3 List turned into record cards: 1 card = 1 object ordered in one way, e.g. accession number</p>	<p>Slightly higher initial cost; if you know the number of the object you want, you can go straight to the right record; and a short walk to the object But if you want to find objects meeting any other criterion, bad luck; no better than 2 Fairly cheap to maintain</p>
<p>4 > 1 card to 1 object, ordered, e.g. one set by accession number, one set by donor</p>	<p>Slightly higher initial cost; if you want to find objects by accession no. or by donor name – straight to the right record, and a short walk to the object But if you want to find objects meeting any other criterion, bad luck; no better than 2 Fairly cheap to maintain</p>
<p>5 A classification, and an extra set of records ordered by classification group</p>	<p>Much higher initial cost – you have to assign records and objects to their place in the classification scheme; and a more complex route to the objects: find the right bit of the classification –> to the records with that class code –> scan till you find the right sub-section and locate the records you want in it –> with luck a short walk to the objects But a good classification opens many doors into the collection and adds greatly to freedom of access. More costly to maintain</p>
<p>6 As 5, but the classification has an index</p>	<p>Puts up initial cost a bit, but index makes assigning classification codes to records more consistent, and you can go straight from index to the right batch of records in classified catalogue, so shorter scanning time, and a short walk to the objects (provided they are arranged in something like classified order) Maintenance costs as 5</p>
<p>7 As 6, but with supplementary 'direct' indexes to allow other ways of indexes of artists' names, associated places, events</p>	<p>Adds again to initial cost. The path now goes from supplementary index –> records meeting the requirement –> of objects. So, a more complex path, and the objects you want may be widely distributed, so it may be a long walk More costly to maintain</p>
<p>8 As 7, but with a thesaurus to control the terms used in all indexes</p>	<p>Adds yet more to initial cost, but thesaurus makes for consistency in what things are called, and so a higher proportion of relevant records should be found Adds another stage to the path: find the right term in the thesaurus –> index(es) –> relevant records –> objects Much more costly to maintain</p>
<p>9 <i>Limit of manual methods</i> Back to 1 record = 1 object. But this time the record is electronic, in computer database; it contains full history of objects, before and after entry into collections, and there is an on-line thesaurus</p>	<p>High initial investment cost, but all the ways in provided by 3–8 are built into the system, so the path to the relevant records and objects is simpler and shorter, and there are multiple means of access Reduced maintenance costs Diversity and complexity have merged into simplicity (if you've been clever in specifying what you want from the database!)</p>



refers to stages 1 to 9 in Table 4.1 on p61

- = initial investment and maintenance costs
- = time taken to find required objects

Change		No change	
New	No longer needed	Reduced significance	
Rapid searching of all records in database	Multiple record sequences	Classification: still a useful analytical tool, but can become just one field in a record – in effect a top-level index term	Need to think about: <ul style="list-style-type: none"> • Ways in • Record structure • Terminology
Full-text searching	Separate indexes		
Help with managing terminology	Searching separate sets of records, using different methods		
Links between records and images/sounds			

requires a clear idea of what information management means. Information first has to be gathered, in a way that is cost effective and ensures that it is correct and complete. The information then has to be recorded, and filed in a form that permits its later retrieval in a convenient way to allow the information to be interpreted to solve problems and inform decisions.

At present most of the 'administrative' functions of a museum are best served by a series of separate files, which may well all be paper based, all computer based, or, more usually, a mixture of the two. This information about staff expertise and training, because of an element of personal confidentiality, might well be kept as paper files with restricted access, but nowadays very few institutions would attempt to manage their finances by a series of manual written ledgers. How the information is best gathered and, just as important, kept up to date, on the topics outlined in the previous part of this chapter will depend on the nature of the individual museum, and thus on the sources available to it.

Gathering the information

For budgetary control, and to keep track of suppliers of goods and services, for instance, it may be possible in local authority or university museums to tap into this information from the governing body, who may also supply the necessary software (and, if you are really fortunate, the hardware) to make use of the information. Such a course is not usually open to independent or national museums, who therefore would need to provide their own software for these purposes.

Collaboration in information gathering can be most cost effective. For example, keeping abreast of advances in information technology can be time consuming, but by periodically meeting with other people in charge of IT in museums a great deal of useful information and advice can be transmitted between the participants in a very short time. Then when the IT specialist re-

returns to his or her own museum a brief report to interested colleagues quickly disseminates the information relevant to the institution, while any IT database can be updated with the latest 'peer-reviewed' information on database management packages, support organizations and so on. In the UK, the Museum Computer Group meets twice a year at different venues around the country, and is an important source of up-to-date information and experience. Other, regional, forums have been established where local museum staff who are responsible for documentation and information technology, but who are unable to justify attending a distant national meeting, can get together for mutual support and to get guidance on specific problems.

Approaches to organizing the information

While well-organized paper files of, say, information on markets, competitors and collaborators might be fairly easy to compile, without indexes efficient retrieval will be difficult. Even more problematic is that such files are relatively inaccessible to more than one person at a time, and may be physically scattered around the institution, often wherever the person responsible for their compilation happens to be based. This can make the gathering of different aspects of information of relevance to a given problem both time consuming and inefficient. It is therefore suggested that as far as possible institutions should endeavour to make all relevant information available in computerized form, and that networked connectivity is used to ensure that everyone who has the need can easily and quickly access the information they require to inform decisions for which they are responsible.

Deciding what it is *relevant* to put on the computer will exercise the brains of all the staff involved. Take the example of 'markets, competitors and potential collaborators': here much of the information gathered may be in the form of brochures, annual reports, press articles, etc. It would be unnecessarily tedious and expensive to digitize all this information; what is needed is for an intelligent precis of the information to be placed on the computer in a structured form, but with links back to the published information held on file. Exactly what goes into the computer precis will depend on the uses envisaged. One use may be comparative – 'How are we doing compared to our competitors?' – so annual and/or seasonal visitor totals might be one criterion, and these will need to be held for several years to show changes. This requirement would govern the type of database software required, so the decision on the information needs has to be taken before deciding on the software to use. The institution's own figures are probably recorded on a daily or weekly basis, and might well be held in the form of a spreadsheet for short-term monitoring and analysis. Thus a simple way to transfer totals from that spreadsheet to the database used for the 'competitor' information is another requirement to be borne in mind when choosing both the spreadsheet and the database management system.

Use the tool for the job

In practical terms the various facets of the museum's information will be held in separate databases, and though if networked these are accessible by colleagues, for someone actually to make connections between the various items of information will usually require the retrieval of different information from the separate databases and making the interpretation and assessment 'off-line'. While very sophisticated 'corporate' database management systems are available that might allow the totality of the museum information base to be held in one package, the cost and complexity of support needed would put them out of reach of all but perhaps the largest national museums. The recently completed large-scale systems initiative (LASSI) by a consortium of major UK museums has now agreed on an all-embracing collection management package, Multi-MIMSY. See p170 for a case study of the LASSI initiative. However, this is still expensive relative to many museum budgets, and does not cover finance (other than valuation and insurance), personnel or other institutional management information. For the smaller museum, it is much more cost effective to use a simpler, cheaper and easily supported database management system, but to ensure by careful design of the various databases that the disparate information they hold is presented to the user in as consistent and comparable a form as possible.

Access control

While ensuring that *necessary* personal, commercial and academic confidentiality is protected, the approach of management should be to make as much information as possible available to as many staff as possible at all times. Naturally some restrictions will need to be placed on access, and probably these should be largely role determined, on a 'need-to-know' basis. Thus the marketing manager should have free access to the information needed for the job, but re-stricted access to, say, salary information.

With paper files access is controlled physically by keys to locks on filing cabinets, etc. The same principle applies to computerized records, only here the 'keys' are user name permissions and passwords. Access to computer information can usually be refined to give various levels of access, from read only; through read and add information; read, add and change; and, at the highest level, read, add, change or delete records. In a networked environment the level of control can be quite sophisticated; not only can read, write, edit and delete be permitted to whole files, but often they can be restricted for given users down to individual 'fields' of information within a single database. Stakeholders would normally need only read or read-and-write access, while the guardians would have read, write and edit access. Deletion of records from databases should normally be reserved to the system manager only.

Applying this chapter in the small museum

Collections information

Follow SPECTRUM for the minimum essentials. Go for the simplest you can get away with in recording and indexing; be guided by your knowledge of how people want to look for information; apply it consistently; aim to get everything to same basic level, and then upgrade as opportunity offers. Use MDA training services. See the case studies of small and medium-sized museums in this book for some examples of successful approaches.

People information

Collect only the basic minimum, and then keep it up to date, and act on what you learn from it – don't collect anything that you can't use. See the North Somerset Museums Service case study p223 for an example of productive use of visitor information.

Card indexes are fine for contacts – provided one person is responsible for them, and they are conscientiously kept up to date (the same goes for contacts databases!).

Human resources

Volunteers can make an invaluable contribution, provided their work is well managed. For useful examples see the Ceredigion Museum, and Norfolk Museums Service case studies pp158 and 214.

Appropriate technological support

Resist having hardware and software wished on you! Define what you require to help you do the things you really need to do, and seek advice from other museums with similar needs, and from MDA.

Integrated use of information

Being small is an advantage here; just make sure there is a 'forum' where everyone concerned can exchange information informally and negotiate action on it. See the Ceredigion case study p158 for an example. Remember that small improvements in using information are not to be sneezed at; something useful is always better than nothing.

Summary

The essential points of this chapter

1. Museums have multiple and complex needs for information management in order to make productive use of the knowledge they require to achieve their objectives and prosper.
2. They also need to manage this diversity of knowledge in an integrated way in order to get the best out of it.

3. Their information management requirements are similar to those of most other organizations, but they have certain special requirements which arise partly from the nature of the things they handle, and partly from their specific objectives.
4. They can learn useful things about information management from other organizations.
5. They still need to use the traditional 'tools of the mind' in thinking about what they have to do with information.
6. But, so long as they do that, there is a great deal of help available from modern information technology.
7. Information sharing with colleagues in other museums about developments in IT pays off.

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