

CHAPTER II. INFORMATION IN CULTURAL REPOSITORIES

A. THE DATA

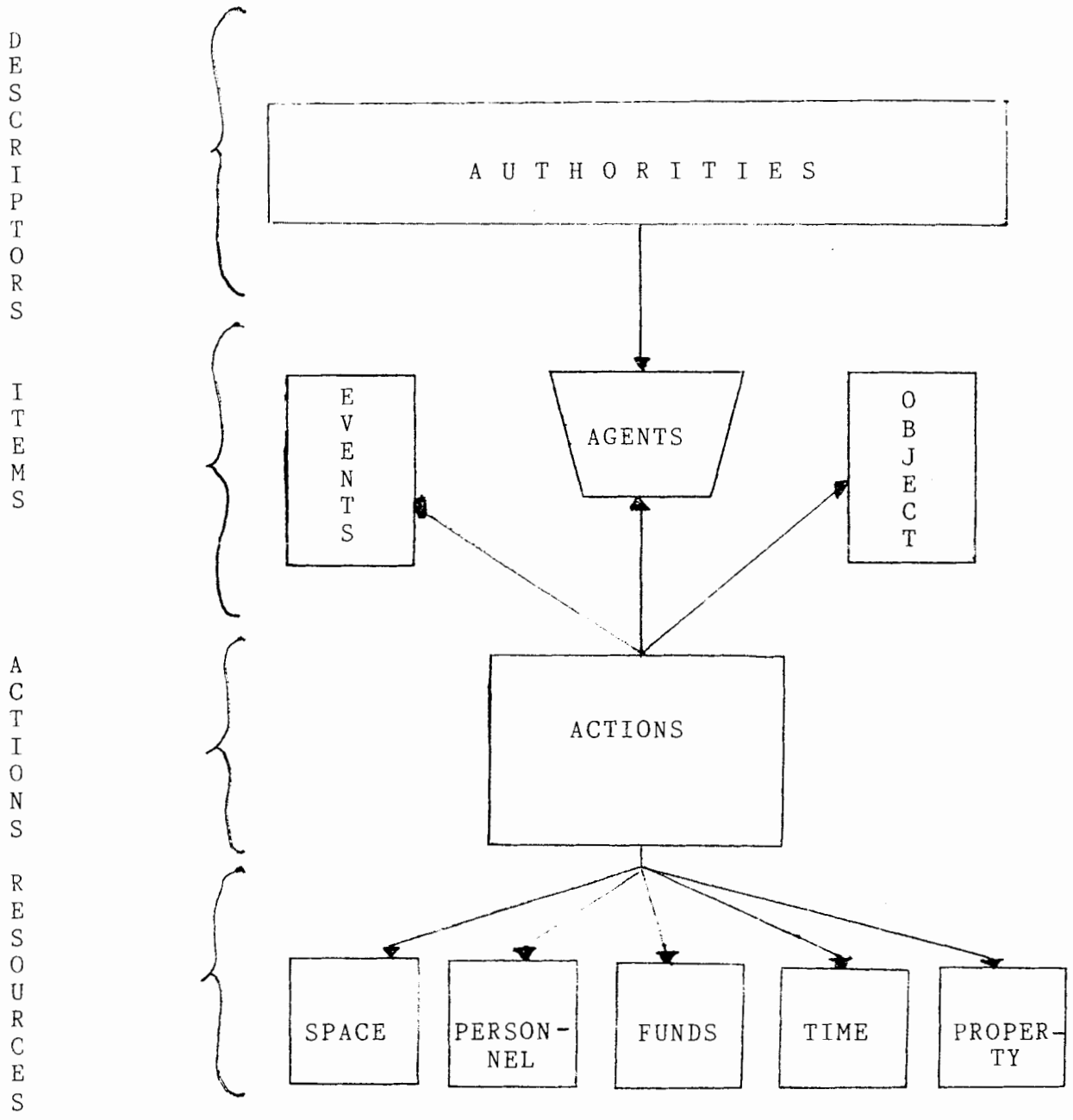
Over the past several years a consensus has been emerging concerning the appropriate data structures for collection management systems. The structure consists of a variety of record types with similar, but not identical, fields from one system to the next. These commonalities are illustrated both in the systems being offered by vendors and in the design documents and Requests-For-Proposal's (RFP's) being issued by potential buyers of collections management systems.

Typically the collected object itself is the primary file. In systems which are designed to be relatively generalized, this object may be a variety of media (artifact, publication, archival record, photograph, etc.) and a variety of levels of aggregation from collection to piece. Typically also, the system will support a variety of ancillary administrative files concerning donors or shippers, or members and a variety of indexing files, concerning artists, or taxons, or functions of artifacts. Specific relationships are defined between these files which are unique to each pair of entities

This study proceeds from a very much more generalized view, in order to describe all the kinds of entities which might be supported by collections information systems and to identify types of relationships that pertain between large groups of entities which operate in a similar fashion within collections information systems. These high level entity groups and their relationships are illustrated in Exhibit 1. and are discussed at some length in this and subsequent chapters.

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Exhibit 1



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1. Objects:

Objects are rarely implemented as a single kind of entity. Instead, in most systems, we see separate object records for each hierarchical level, collection type and generational or representational relationship. I suggest that this simply reflects a lack of flexibility and generalizability on the part of systems and that system designers ought to be strived for a single entity definition

a) Object by hierarchical level:

An object may be an INSTITUTION, a COLLECTION or ACCESSION, a CONSTRUCTION or ITEM or COMPONENT, or a PIECE. In a system which establishes this hierarchy, all items and pieces comprising a single accession may be automatically linked to the same donor information and all objects owned by the repository in a single institution may have the same ownership information. This feature of an information system is called the inheritance of attributes and, when it is implemented, it can be one of the most powerful functions performed by collections management systems.

Inheritance, however, is a complex matter, and, as we shall discover, not all properties of higher level objects are inherited, and inheritance as a strategy imposes a few administrative constraints. Some of these administrative constraints are self-evident, and already well reflected in standard practices; for instance, if items, and even fragments of items, within an accession are to inherit a common "source", the accession may not include objects from more than one source. Other administrative constraints are less obvious, and implementing them to achieve their informational benefits, may have procedural ramifications. For example, pieces may be pieces of components (a piece of a chair leg), or of items (a piece of a pump), or of constructions (a piece of a skeleton), but components have no necessary relation to items. In designing a system to take advantage of inheritance, we seemingly fail to distinguish between two apparent levels of the object hierarchy but in reality we are only reflecting the fact that one person's item is another's component (is a tea cup an item or part of a tea set) and that one person's item is another's construction (is a locomotive or a scrapbook an item, or is is a construction of boilers, wheels and fireboxes or of correspondence, clipping and photographs). It turns out that as we study cultural collections, views of what constitutes an object of study are closely

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correlated with different disciplines of study. Thus if we only serve the interests of ecologists, evidence of the skeletal remains of a given species of animal in an area is sufficient, but social anthropologists may be more interested to know that while all other bones are routinely found in the area, only the skulls of this species are found among human habitations. The skull, therefore, is both a bones of a skeleton and, probably, a component of a cultural ritual, depending upon one's view.

On the other hand, the hierarchy distinguishes clearly between items brought together by an administrative act (collections or accessions) and those which belonged together originally. It also makes a distinction between a component, which is intended to come apart from the whole, and a piece, which is broken. Thus if my collection consists of buttons, others may consider them as components of uniforms and costumes but no one will classify (the whole ones anyway) as pieces. The bones of a skeleton are both items and components of a larger construction and are always different from a bone fragment.

b) Object by collection type:

Most collection management systems distinguish between an objects of three dimensions (artifacts and specimen) and those of two (drawings or written works, for instance), only because the institutions which created them or will purchase them tend to collect more of one than the other and the attributes of each are different. Such cooperative undertakings as the Canadian Heritage Information Network have found that for reasons of common language, if no other, natural history objects and cultural history objects require separate data dictionaries⁴. While this distinction is useful for political reasons, it is largely irrelevant to the systems designer who must create a system which performs certain functions without respect to the particular attributes of discrete classes of objects. It is true that the attributes of snails are different from those of fish, and very different from those of minerals, yet we must manage collections in natural history

⁴ These data dictionaries, published by the Canadian Heritage Information Network (365 Laurier Ave. West, 12th Fl., Ottawa, Ontario, K1A-0M8) are a valuable resource for museum curators considering automation, but systems designers should be careful to regard them as potential data elements, not as design documentation.

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museums which consist of all three. The difference between the information captured by those institutions which collect books as artifacts and those which collect them as information sources is as great as the difference between the description of a drawing of a fish skeleton and the skeleton itself.

From the perspective of functional requirements it is more important that we might want to record the volume and weight of a mineral and have the system calculate its density, than it is that we would also record the volume and weight of a basket, but only the weight of a hammer. It is important to know that a variety of materials may comprise a geological specimen or a cultural artifact if we are otherwise tempted to provide only a single value field, but functionally it is more critical that we recognize that material composition will help determine where to store the object, and what kinds of conservation attention it will require.

c) Object by Generation or Representational Relation

Almost all collection management systems define separate entities for an object, a model of the object, a bibliographic reference to an article on the object, and a photograph of the object. Some establish separate entities for a photographic negative, a slide, a print and the image recorded on videodisc. There are some implementation reasons for some of these distinctions, but if they result in requiring the recording of duplicative data to describe the various manifestations, generational and representational, of a single item, the implementation should be reconsidered. Most information about a sculpture, the original mold for that sculpture, the artist's original model, the artist's original drawings, a commercial model of the sculpture, a photograph, a drawing and an article about the sculpture, is shared, and the numbers of different forms which representations can take makes a strong argument for implementing generational and media representations as overlapping data sets.

2. Events:

Likewise, events are rarely considered at their most abstract level by system designers. The reasons are similar to those for objects, except in this case they are usually also supported by organizational assignment of responsibility to distinct administrative units and are therefore particularly resistant to common implementation.

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a) Events by Hierarchy

Events may be everything taking place in a FESTIVAL, COURSE or SERIES, a SINGLE EVENT such as a play or movie, exhibit, lecture, tour, publication etc., an EVENT COMPONENT, such as a specific performance or showing, an interactive kiosk, an opening reception for an exhibit, or a visit to the Parthenon on the third afternoon of the "Greek Antiquities Study Tour".

Events provide an occasion to discuss the reverse of downward inheritance: additive properties. If festivals consist of a series of events, their duration is the range of dates for each event involved, and their location is the sum of locations of the individual events. The higher level entity in this case builds its properties from the sum of its constituents. This in no way negates what was said about inheritance of characteristics in a parent-child hierarchy in our discussion of objects. Both kinds of relationships exist in both kinds of records, and when both are implemented in a generalized way, the system will have substantially more power.

b) Events by Type

Responsibility for EXHIBITS, PERFORMANCES, PUBLICATIONS, COURSES, and TOURS is typically divided between administrative units in a cultural repository. As a consequence, most collection information systems which support reporting of events at all, distinguish between them, although the information recorded about events (when, where, for whom, how much, how many, etc.) is similar and the collection management purpose, which is to establish a link between an object and the history of events in which it participated (through an action) is identical. Functionally, the most complicated events are those which require places reservation and ticketing, especially when there are numerous options involving different prices and benefits. Significantly, these kinds of events may be courses or tours, subscription performance series or even exhibits.

c) Events by Generation or Representational Relation

Just as objects may have generational and representational relations with other information in the system, so may events. Events have plans and blueprints, designs, texts and scripts. They are taped and photographed. They are also reviewed, critiqued and evaluated. While these

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representations may be used only as informational surrogates for the actual event, typically the functional implications of this information are substantial. Representation are used in planning, in construction of exhibits, in advertising and in publication; in each case the system does something with the information beyond simply retrieving it. Even the highest level abstraction of events, the event calendar, has complex functional requirements: we want to retrieve events conforming to particular selection criteria, to refuse to permit events to be scheduled for the same time and place (with necessary buffers for set-up and take-down), and to display events in familiar (calendrical) reports.

3. Agents

Nothing happens without someone making it occur, so cultural repositories depend upon a wide range of outside agencies and individuals to perform a wide range of tasks, and need to keep track of who does what kinds of work and how they do it.

a) Agents by type

Cultural repositories have very similar needs for data about all classes of agents, but in practice they tend to implement different systems to manage relations with different classes of agents because of organizational lines of authority. The tasks performed by agents of cultural repositories include, in addition to traditional vendor relations (SHIPPERS, INSURERS, EXHIBIT DESIGNERS, CONTRACTORS, APPRAISERS, PRINTERS, etc..) some special "agencies", such as are performed by DONORS (of objects), SOPPORTERS (who donate money), and MEMBERS, and "agencies" which are involved in the life-cycle of objects prior to their collection by the cultural repository (DEALERS, BROKERS, MANUFACTURERS, OWNERS). Other classes of agents include users, such as PATRONS (who arrive on premises) and BORROWERS (institutions). As a design consideration, cultural repository information systems should aim to implement no more than these three categories of agents, permitting different data definitions within the categories to support the unique information which is required for the more specific types.

b) Agents by Organizational Responsibility:

An absolute distinction is drawn between agents as outside of the organization and personnel (whether employees or volunteers) on the basis

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of functional requirements. Very different legal reporting requirements are placed upon an organization with respect to its paid and volunteer staff and management requirements are therefore different. Designers should note that some contracted services personnel who perform their work on premises must be considered, functionally, as employees. Nevertheless, there are a large number of functional requirements which are common to agents and employees - both may be paid (or otherwise rewarded, as are volunteers) in proportion to the time they serve and/or for the specific tasks they achieve. In addition, management assigns tasks to both agents and personnel and monitors performance on a continuing basis. Assignment of additional tasks is based on performance (perhaps less so with employees than management would like) as well as on capabilities and availability.

c) Agent Capabilities and Performance History:

All agents are described to the information system according to the kinds of tasks they perform for the cultural repository whether those tasks are those of potential donors or potential shippers. The history of their performance is used as a factor in determining whether to approach them again for the same service. Not only is the underlying purpose of the performance histories the same, the categories of data are very similar: dates, task descriptions, achievement levels for particular kinds of objects and under particular conditions. While there is some psychological discomfort caused by discussing patrons and shippers in the same terms, the functional requirements can be usefully understood together.

4. Authorities

The holdings of cultural repositories, the events they sponsor and the agents who perform actions for them, can be described and located in the context of a conceptual domain as broad as all of human discourse, but in fact what we tend to record about objects, events and agents is who, what, where, when, and how. That is, we record the name we give an entity, its location in time and space, its material or social composition, and its relationships. Thus, the methods of access which we support in cultural repositories information systems employ names of people and corporate entities, dates and periods of time, geographical and other locations, material and intellectual composition including style, genre, technique and method, and a variety of classifications and typologies of "whatness".

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a) Authorities as index terms:

Most of these intellectual approaches to description of the entities in cultural repository databases, can be applied to description of objects, agents or events. A personal name may be associated with a objects in a variety of relations (creator, owner, and even "user" as in George Washington slept here), and the same name may be an agent (donor or vendor) and the subject of, or a participant in, an event. Similarly, Spain may be the provenance of an object, the headquarters of an agent, or the subject of an exhibit. We speak of dealers in art deco, art deco objects and lectures on the art deco style. Cultural repositories, therefore, have reason to employ these concepts consistently in order to bring relevant information together from a variety of physical locations within their various information systems. If a donor indicates a willingness to provide funds for the restoration of empire period furniture, management needs to identify both the objects that meet the description and the conservators who handle such specialized work in order to give the potential donor an estimate of the cost and a description of the objects which their contribution will refurbish. If both files are assigned the same index term, and indexed together, this retrieval will be supported.

b) Authority headings and authority records:

In the previous example, the term empire period was an authority heading assigned to object, event and agent records (both for conservators and soon for the donor). Furniture was an authority heading from a separate vocabulary, assigned to objects and probably to the conservators, though the events included architectural elements and paintings as well. The term itself is called an authority heading, and it operates in the information system in the same way regardless of the type of authority it is. But for the term "empire period" to do its job (which is to bring entities with similar characteristics together) it needs to be assigned consistently by everyone who might use it. To assure such consistency, additional information is required, which is stored in an authority record. The authority record for a "style" heading, would probably include the dates to which the term is applied, places the style manifest(ed) itself, the features of the style which distinguish it, references to exemplary, representative or definitive type specimens, and bibliographic citations for further information. The authority record for a species heading, in addition to the name term, would probably include dates in which the species lived, locations it inhabited,

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characteristics of the species, references to the type specimen, and citations for further information. In terms of fields of information required, the authority record for a corporate entity (company, government or voluntary association) is similar to that for a genre. Both require a field for the headings itself, "scope notes" explaining when and how the term is to be assigned, cross-references to other terms that are related, and a note on the source, or authority, by which the term was verified.

5. Resources

a) Resources by Type:

The resources of an institution, in addition to its holdings, are its STAFF and FUNDS, its SPACE and the TIME it has to achieve its missions. While the fundamental issue with respect to resources is the same for all resources regardless of type (budgeting the resource, assigning the resource, accounting for the use of the resource and projecting future needs), the units of measurement and traditions for accounting for resource utilization are sufficiently different that cultural institutions, and all other organizations, must employ different systems to manage information about the five fundamental categories of resources: funds, personnel, property, space and time. Nevertheless, there are some important commonalities in requirements which can best be understood by considering resources together.

b) Resources by Management Function:

A budget or plan for resource allocation requires that we take the available amount of any resource, identify categories of expenditures and known rates of resource utilization associated with each, and distribute the resource over the categories, with predictable results measured in units of output. As will be discussed extensively in the next chapter, the concept of actions provides the framework for categories in resource budgets, and actions can be the unit of output. However, resource allocation never operates on a single dimension alone. A budget which allocates funds but does not establish a time frame for their expenditure is absurd. Task assignments which identify personnel who are to perform a task but do not recognize that time and space and funds will be employed in the process are inadequate as means to rational management. While a particular management function (planning operations, evaluation) and a specific type of

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resource (money, space, holdings) may be the focus of a resource information system, connections between different resources are real and must be supported in cultural repository information system applications.

6. Actions

Actions are the central element of information in a collections management information system. It is through actions that objects, agents and events are linked to each other and to resources. Actions are not the smallest component steps of activity in which the staffs of cultural repositories engage, but they are the smallest units of analysis which distinctly belong to the domain of cultural repositories and collections management. Therefore an information system which is designed to support actions must be flexible enough to permit local definition of what is required to constitute an action, just as it is sufficiently flexible to allow local definition of what actions comprise a procedure. A dictionary of these actions follows the data structure of an action record which is presented in Exhibit 2.