CIMI—Computer Interchange of Museum Information:
Realising Information Access and Interchange

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Since the introduction of computers into museums we have wanted to exchange information held in computerised files. This desire motivated the formation of the Museum Computer Network (MCN) in the United States more than 20 years ago and is spawning new projects today. Museums of all sizes are exploring collaborative projects to build databases and networks with wide but controlled access, and are banding together to pool resources for information-sharing projects that no single organization could hope to accomplish alone.

Museums also want to incorporate information from a variety of sources and formats, including print, oral history, and still and moving pictures, into their documentation processes. The vision of expanded documentation of collections will become commonplace only if consulting and exchanging computer records becomes easier to do.

One important concern museums have is whether computerised information will be accessible and meaningful to anyone else long after the original collectors of it—and the systems they worked with—have vanished. Even greater is the fear of being trapped with one vendor’s system. "Will I be able to take data from one computer system and move it to another?" is not a question that as yet has a simple answer.

At first these areas may seem unrelated, but they all are related to information interchange. Interchange is moving data from one system to a replacement. Interchange is building and sharing information and databases, and interchange is communication.

Making this kind of interchange work is difficult to do because different types of computers have problems "talking to each other" and because the organisation and structure of the information in the computer varies considerably. One solution is to have everybody use the same system and do everything the same way, but—as has been clearly shown in the world of commerce and business—this approach is doomed to failure. Openness and interconnectedness using standards as a foundation is the approach now being promoted.

What CIMI Is

CIMI, initiated in 1990 by the Museum Computer Network as a grant-funded project, has now evolved into a full committee of the MCN working to develop a standards framework for interchanging all types of museum information via computer. The framework will allow museums to do the interchanges they imagine: exchange records, build common databases, and move information from one system to another. Now is the best time to develop a common, accepted method of interchanging information while museums are in the relatively early stages of automation and before disparate, irreconcilable approaches are taken by both institutions and vendors.
We hope the work of CIMI will encourage the exchange of information for scholarly and research purposes, make cultural heritage information more widely available, and preserve investments in creating information in electronic form.

**Interchange of Museum Information**

Interchange is not new: we all do it now by calling colleagues, sharing documents, and exchanging floppy disks. However, as historical scholarship and curatorship become more reliant on computer-based tools, the computer interchange of museum information will become more necessary. This type of interchange will make new demands on our ability to communicate because we are dealing with unfamiliar technology, not the comfortable oral, written, and published traditions.

A good way to visualize the problem is through the metaphor of people conversing. Language, grammar, syntax, and vocabulary provide the basis for oral communications that use the technical facilities of the vocal cords and the transmission of sound in air and the ear to carry the message. Similarly, written communications make use of different media but still depend on language and vocabulary to convey meaning. Generally we are not confused by communications of this type because we understand the rules, conventions, and requirements for successful exchange; they are part of our lives from our earliest learning experiences. Not so with computer interchanges. Here we need to become familiar with the new equipment, learn new rules, create the formats and syntax, and agree on meanings and vocabulary. This is what CIMI and its task groups are doing.

From the beginning CIMI was designed to work in partnership with representatives of various types of museums to get the broadest possible perspective. In this partnership, museum professionals working as task groups define the information that is important to exchange, called interchange services, and CIMI develops the technical interchange framework needed to carry the information. By working together the burden is shared and each partner represents their concerns and offers their expertise. If this approach is successful, computer technocrats do not end up telling curators and historians what information to deal with, and museum professionals are relieved of the technical aspects.

Once the task groups have defined the interchange services needed, CIMI staff works with them, technical experts, museum system vendors, and museum information networks to see the concept turned into a reality. Ultimately this is done by building interchange capability into the software used by museums, but there is a great deal of work that has to come first.

**Towards an Interchange Format: Establishing Requirements**

The task groups describe their interchange services in the same way that requirements for systems development are described. These requirements then are expressed formally and technically in an interchange service definition. Once this is done the requirements can be analyzed and an interchange format proposed to support the needed services.

An interchange format is simply a way of organizing and representing data so that it can be exchanged, from one system to another. It is based on rules and agreements on how the information is organized and represented. "ASCII text" is a simple interchange format for text; an ISO standard, Standard Generalized Markup Language (SGML), is a complex one. MARC is an example of an interchange format for bibliographic material.
The goal of CIMI is to produce an internationally standardized interchange format that will provide a means of transferring data from and to any sources required for museum purposes yet is independent of any one kind of software, one system, or one vendor. This will be done in part by proposing the adoption of extant international and national standards and models as frameworks for museum data exchange. This ensures both that the format will be independent of any one system, and that the format will be designed in step with the thinking in the broader technical community.

Because of the diversity of the information that museums store, the interchange format must handle all types of data, including text, numerals, images, multimedia, graphics, and sound, which places enormous demands on the traditional concept of a museum record from both a structural and a content perspective. A theoretical record may include textual data about an object followed by an image file, then sound bytes, then pointers to other data files acting as authorities. This is not exactly today's most common form of record, and goes well beyond the current capability of even the established exchanges of the library networks, but it is well within the scope of system models currently under development and new international standards for multimedia and hypermedia.

To cope with these complex requirements, the CIMI interchange format will have to accommodate dynamic and flexible methods of transmitting data and, most certainly use multiple existing transmission protocols. Images, for example, will be best carried in an existing format such as Tagged Image File Format (TIFF) or Computer Graphics Metafile (CGM), rather than CIMI trying to redefine a new image standard. At the same time it will be necessary for the interchange format to be compatible with the millions of MARC formatted records already in existence.

Not only does the interchange format have to carry information, but it needs to be able to tell the receiving system what to do with it or what the sending system is expecting as a result of the exchange. This is done by carrying meaningful instructions within the interchange or agreeing in advance as to what these are for specific interchanges. For example, information about how different records or parts of records relate to each other (e.g., authority files or pointers to related records) can be declared within a transmission. Another way is to agree beforehand in great detail what is expected in a particular interchange session.

In the first year CIMI spent much of its time refining the requirements. The range of options for fulfilling them has now been narrowed down to a set of standards that seem appropriate. This set will be further refined through trials with data contributed by the task groups mentioned earlier. The validation process involves taking the requirements for data, relationships, and functionality and examining the interchange format's ability to accommodate the stated requirements. By repeating this process a number of times, the requirements for exchange are finally accommodated to the committee's satisfaction. In some instances the interchange format will need to be modified; in others CIMI may suggest alternate approaches to the task group that may restate the requirements.

Although a large number of data and functional requirements will be examined initially, not everything will be accommodated at once. An important part of CIMI's work will be to make the ongoing articulation of museum interchange requirements possible. This will become part of the process that allows the interchange formats to be continually revised and updated. Throughout this time CIMI will concentrate on developing a mechanism to channel
requests from committed professional groups to map their interchange requirements into the CIMI framework.

Continuing Discussions
Getting the results CIMI wants requires extensive discussions with a widely dispersed group in a very short period of time. In order to foster a dialogue within the broadest possible community CIMI publishes a newsletter, CIMI News, and other more technical papers, and also publishes news and information in the professional literature.