OBSERVATIONS ON THE DEVELOPMENT OF ART INFORMATION STANDARDS IN NORTH AMERICA AND EUROPE

These remarks focus on the development of art information standards in North America and Europe, particularly in relation to museum and cultural heritage automation projects.

Since various individuals may have a slightly different understanding of what "standards" encompass and what role standards play in automation, I will briefly address the following questions:

— *What are information system standards and what forms do they take?*
— *Why should we use standards?*
— *Are any patterns emerging in the development of standards and, if so, what has motivated this activity?*
— *What is the interest of the J. Paul Getty Trust in the development of standards, and what role does the Getty Art History Information Program play in this effort?*

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WHAT ARE INFORMATION SYSTEM STANDARDS AND WHAT FORMS DO THEY TAKE?

To begin with a basic definition, *Standards are mutually agreed-upon statements that help to control an action or product.* Although this definition may appear innocuous, acceptance of the need for and value of standards in art database applications has historically been a very slow and difficult process. One reason for this lack of acceptance by the art-historical community has been the absence of standards appropriate to meet the unique needs of subject specialists. Second, developing standards can be time consuming, costly, tedious, and frustrating. To make things worse, the history of art is based largely on interpretation; the information available about a work of art may conflict as easily as agree. Therefore, discussions surrounding the development of standards can be highly emotional and "political."

Given this ambiguity and potentially emotional or "political" nature of information in the history of art, the concept of "standardization" is perceived negatively. It is important to note here that unfortunately it has often been falsely assumed that "standardization" implies adherence to rigid rules. As the number of art research databases has grown in recent years, however, it has become generally known that standards can vary widely, from strict forms to more flexible guidelines that allow for the needs of individual institutions and the various constraints under which they may operate. The range of available standards can

be characterized broadly as follows (definitions formulated by the working group on standards and archival description of the Society of American Archivists) [1].

Technical standards. These are the most rigid and exacting; if followed correctly, they will yield identical products. Examples outside our field would include postal codes, telephone area codes, Morse code, or (in the field of automation) the ASCII character set: the 128 seven-bit codes that define the alphabet (both upper and lower case), the numbers 0-9, punctuation marks, and control codes for text processing and data communication.

Conventions. These rules or professional standards are more flexible and accommodate more variation in local practice. When applied correctly, they will result in similar but not necessarily identical products. In the library world, *Anglo-American Cataloguing Rules*, second edition (AACR2) is an example of a standard that is flexible and subject to interpretation, while the Library of Congress Rule Interpretations are examples of more rigid standards in that they determine which of the options AACR2 provides are to be used in Library of Congress cataloguing.

Guidelines. These provide a broad set of practice or service criteria against which to measure products or programs. Examples of these more flexible forms of standards in a non-automated environment might include the *Chicago Manual of Style* or the MLA *Style Sheet*, guidelines for the preparation and format of journal articles, books, and dissertations.

Let's look now at a diagram illustrating some of the types of standards relevant to information systems (Fig. 1) [2], which can be broken down into data standards (further broken down into data structure, data content, and data value), procedural standards, and information interchange standards.
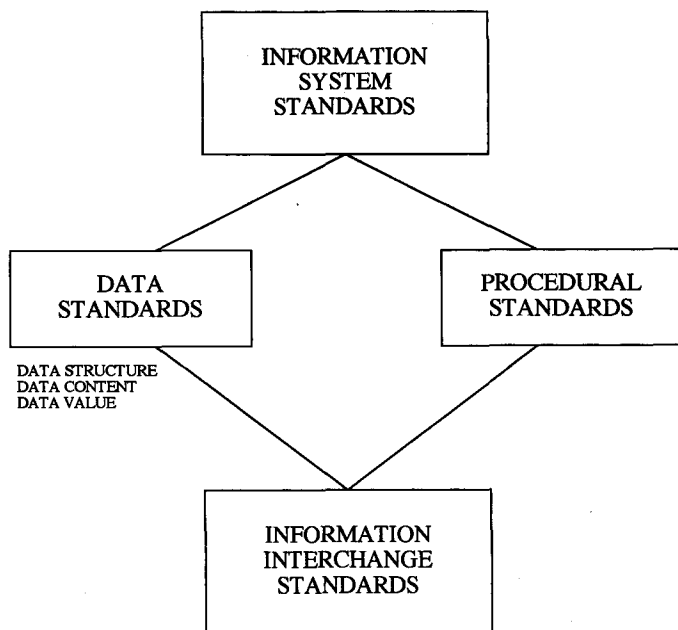
Within **data standards**, we are specifically addressing how structure, content, and values for data are defined.

Data structure is concerned with what constitutes a record, such as the different fields that can be used to record information, and the relationship among these fields.

Example: A description of the media used to create an object might be contained in a single, broadly defined category, or recorded in a cluster of related, highly specific categories, perhaps including media, support, and techniques.

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[1] « American Archivist », 52 (Fall 1989), 452-454.

[2] This diagram was developed by D. Andrew Roberts and John C. Perkins for the International Museum and Cultural Heritage Documentation Standards Meeting held in Canterbury in September 1991; see note 9.

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              ┌─────────────────┐
              │   INFORMATION   │
              │     SYSTEM      │
              │    STANDARDS    │
              └─────────────────┘
              ╱                   ╲
┌─────────────────┐         ┌─────────────────┐
│      DATA       │         │   PROCEDURAL    │
│    STANDARDS    │         │    STANDARDS    │
└─────────────────┘         └─────────────────┘
DATA STRUCTURE    ╲                   ╱
DATA CONTENT
DATA VALUE         ┌─────────────────┐
                   │   INFORMATION   │
                   │   INTERCHANGE   │
                   │    STANDARDS    │
                   └─────────────────┘
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STANDARDS FRAMEWORK

Fig. 1

Data content is concerned with the rules and conventions that govern the way data should be entered into fields, including cataloguing rules and syntax conventions.

Example: Depending on the cataloguing rules being followed, the name of an artist may be entered in direct or inverted form[3]:

Bologna, Giovanni
Giambologna
Bologna, Giovanni da
Da Bologna, Giovanni
Giovanni, da Bologna

[3] Example taken from the Getty Art History Information Program's Union List of Artist Names, 1991 internal release. The ULAN is slated for broad release in 1993.

Data value is concerned with the vocabulary that can be used in the various fields and the character sets that are allowed.

Example: There are many choices for geographic names, ranging from ancient forms to their modern equivalents. The following four name forms all refer to the same town in northeastern Libya:

Ptolemaïs (mod. Tolmeta) [*Princeton Encyclopedia of Classical Sites*]
Tulmaythah (anc. Ptolemaïs) [U.S. Board of Geographic Names Gazetteer for Libya]
Tolmeta [*Webster's New Geographical Dictionary*]
Tolemaide [Library of Congress Name Authority File]

Procedural standards define the scope of the practical documentation procedures that should be followed for effective management of operations. Examples of procedural standards might include how to log on and off e-mail, or how an institution has chosen to handle acquisition or accession procedures.

Information exchange standards define the technical framework for interchanging information, whether between systems in a single institution or among systems in multiple institutions. Examples of interchange formats include International Standards Organization (ISO) 8879 (Standardized Generalized Markup Language, known as SGML), or ISO 9735 (Electronic Data Interchange for Administration, Commerce, and Transport, known as EDIFACT).

I will not attempt to describe any of the many types of interchange formats in any detail except to say that a standard interchange format is essential if the art community intends to establish networks for exchanging information between systems.

WHY SHOULD WE USE STANDARDS?

Although advertisements for computer products would lead us to believe that computer technology is so sophisticated that it can both permit ambiguities and process information at the push of a button, experience in art-historical applications has proved that this is not the case. Current computers require rules defining the way information is to be structured so that the data input into a system can be read, sorted, indexed, retrieved, and communicated between systems in predictable ways. Adherence to standards helps to define the rules for writing computer programs, and allows systems to function efficiently and to maximize potential retrieval opportunities.

But *what additional benefits are derived from taking an interest in the development of standards?*

One lesson learned after a decade of experimentation in creating databases is that data stored electronically represent the most costly investment for any database. In other words, it is not the cost of the hardware and software, the consultant, systems analyst or programmer that represents the largest investment: it is the *data*. Considering how long it takes to enter data into a computer system, one wants to be sure that the data are maintained properly, and can be transferred to other computing environments. All systems are temporary, and sooner or later will need to be upgraded or migrated to a different hardware and/or software platform. Data standards keep a database internally consistent so it can be managed effectively and permit the data to be formatted and stored in a way that makes it easier to "export" them to other systems. Thus two good reasons for taking an interest in standards and their development are time and money.

We should also be equally concerned about the accessibility of data. What good is it to create valuable resources if they cannot be accessed properly? Understanding the role and application of vocabulary or data value standards helps to maximize retrieval: making sure, for example, that all relevant responses are obtained for every query that is posed to the system.

ARE ANY PATTERNS EMERGING IN THE DEVELOPMENT OF STANDARDS AND, IF SO, WHAT HAS MOTIVATED THIS DEVELOPMENT?

The answer to this question is an emphatic "yes." In recent years there has been a remarkable change in the willingness of the art community to accept the role of information systems standards, as shown in the number of collaborative projects concerning the identification of common sets of data standards that have emerged in recent years, and the number of conference papers on the topic of standards and their value and role. One need only look at the material in the 1988 *Scuola Normale/Getty (SN/G) Report on Data Processing Projects in Art*[4] to notice a significant increase over the number of such projects listed in the 1984 Census: *Computerization in the History of Art*[5].

Why has this change occurred? One simple answer is that the art information community has finally grown tired of "re-inventing the wheel." If standards are emerging, why not investigate using them or collaborate in developing them, and thus spare the time and money needed to develop and maintain one's own set of standards?

[4] Laura Corti, general editor (Scuola Normale Superiore, Pisa, and The J. Paul Getty Trust, Los Angeles, 1988).

[5] Edited by Laura Corti (Scuola Normale Superiore, Pisa, and The J. Paul Getty Trust, Los Angeles, 1984).

There is also an increasing interest in establishing information networks that would make it possible to share information (particularly in the joint development of terminology such as authority files). The interest in information networks is also kindled by a desire to improve access to information and to facilitate data interchange. This emerging trend toward defining common standards for creating a framework for information networks is particularly relevant to the museum and cultural heritage communities.

Another reason for the growing interest in standards is the geopolitical changes occurring in Europe, which have been accompanied by agreements among blocs of countries such as the European Economic Community and Council of Europe to encourage communication across national borders. Significant sources of funding have become available to support collaborative projects among nations in order to pave the way for European and international standards. Whereas the Commission of the European Communities provides funding for collaborative projects, the Council of Europe supports roundtables and colloquia aimed at identifying common standards and fostering data interchange among countries. Judging from the number of new international collaborative projects that have emerged within the last year alone, it appears that over the next decade Europe — rather than North America — will be in the spotlight in terms of automation initiatives. This is not to say that North America lacks collaborative projects; on the contrary, a number of projects are focusing on the development of data standards and the identification of interchange standards.

The goal of the Common Agenda for History Museums — Common Database Task Force, which falls under the American Association for State and Local History (AASLH), is to make available the common holdings of history museums. The Common Database Task Force represents an effort by the AASLH to identify the range of data fields that American museums currently use for documenting historical objects. The task force has two charges: describing data fields appropriate for recording information about single objects, and creating a format to describe a group of related objects. A partial list of recommended minimum data elements for collections management has been published [6].

An initiative somewhat analogous to the Common Agenda for History Museums, the Art Information Task Force (AITF) is a three-year project whose mission is to facilitate access to art information useful to scholars by coordinating the development of standards for describing art objects and related images, and by recommending a format for the electronic interchange of art information. The AITF was formed in 1990 in response to separate initiatives undertaken by three professional organizations (the Museum Computer Network (MCN),

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[6] M. SANDER, *The Philadelphia Story*, «History News», 46 (July-August 1991), 10.

the Visual Resources Association (VRA), and the Art Libraries Society of North America (ARLIS/NA)) to investigate the development of common standards for describing works of art and their images. The task force, sponsored by the Getty Art History Information Program and the College Art Association, is comprised of art historians, museum curators, registrars, and visual resource curators and is supported by a grant from the National Endowment for the Humanities, an independent federal agency. To date, the efforts of the AITF have focused on articulating the categories of information needed to describe works of art for research purposes. The task force also plans to provide recommendations for data content and data value standards.

A project known as CIMI (Computer Interchange of Museum Information), which consists of a committee of representatives from several museum associations as well as museum software developers and network distributors, is working to identify interchange standards for museums. CIMI is not developing a computer system; recognizing that most museums are at a relatively early stage of automation, the goal of CIMI is to develop a technical framework for interchanging all types of museum information, which will allow museums to build common databases, exchange data, and move information easily from one internal system to another.

Among the many standards projects to emerge in Europe, the Museum Documentation Association (MDA) is leading an initiative to develop a Museum Documentation Standard for the United Kingdom. The project focuses on the design and promotion of nationally accepted data and procedural standards, with the participation of the entire museum community of the United Kingdom.

The Council of Europe is sponsoring meetings for a group of cultural heritage experts on monuments and built works which is charged with identifying a common corpus of information to be included in cultural heritage documentation systems and with testing the viability of that information. Fig. 2 (with accompanying key) illustrates some of the patterns emerging in North America and Europe [7]. The majority of projects are aimed at achieving consensus on data structure and content standards.

Given all these collaborative projects that are attempting to define data standards or interchange formats in order to create networks, some organization is obviously needed to play a coordinative role to bring together the appropriate combination of experts to define and discuss issues and to encourage projects

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[7] Diagram prepared for the International Museum and Cultural Heritage Documentation Standards Meeting, September 1991; see note 9. For those interested in a more complete overview of such initiatives, see J. BUSH, *Information Systems in Cultural Institutions*, «Bulletin of the American Society for Information Science», 18, 2 (Dec. 1991/Jan. 1992), 8-13, which is based on a survey of projects in North America and Europe completed for the AITF.

to work together. For example, at present European and North American projects have little opportunity to communicate on these crucial issues. The sponsorship of projects by the Commission of the European Communities excludes funding for U.S. participation — an unfortunate situation in light of the number of similar projects on both sides of the Atlantic. There appears to be common interest in developing information networks in our field, but what vehicles exist for projects to share information? It is unclear, for example, whether or not the Commission as a sponsor encourages dialogue among its projects. And what about the projects sponsored by the Council of Europe? Is there communication between the Commission of the European Communities and Council of Europe projects?

The successful development and implementation of standards require cooperation and collaboration among all parties affected. An individual or organization cannot unilaterally devise a set of practices or policies and expect them to be widely adopted.

WHAT IS THE INTEREST OF THE J. PAUL GETTY TRUST IN THE DEVELOPMENT OF STANDARDS, AND WHAT ROLE IS THE GETTY ART HISTORY INFORMATION PROGRAM PLAYING IN THIS EFFORT?

The Getty Art History Information Program (AHIP) has long been an active participant in the development of art information standards through such projects as the *Art and Architecture Thesaurus* (AAT)[8], the *Union List of Artist Names* (ULAN), and the *Thesaurus of Art-Historical Place Names* (TAP), all vocabulary resources slated for release in 1993/1994 that will help to lay the groundwork for a common language in such core domains as personal names, descriptive terminology, and geographic names. AHIP also sponsored the Thesaurus Artis Universalis (TAU), a committee under the aegis of the Comité International de l'Histoire d'Art (CIHA), which examined and recommended standards for developing databases of biographical information on artists and creating historical geographical databases. In 1991, AHIP, along with the College Art Association (CAA), became a sponsor of the AITF.

In recognition of growing international interest in standards as evidenced by the projects being sponsored by the Commission of the European Communities and the Council of Europe, over the past year AHIP has begun to take on an international coordinative role. Following the 1991 meeting of the Museum Documentation Association in Canterbury, AHIP, together with the Interna-

[8] Published in print and electronic form in 1990 by Oxford University Press.

tional Council of Museums (ICOM), convened a meeting of representatives of international collaborative projects [9] in order to
— define projects and determine areas of common interest
— explore possible areas of overlap and collaboration
— encourage dialogue and liaison among projects
— provide a mechanism for ongoing dialogue.

The outcome of the meeting was an agreement to publish a brochure describing the category or type of information system standard being developed by each project (data content, data value, procedural and information interchange standards). It was also agreed to include representation from scholarly collaborative projects, to seek liaison with the Commission of the European Communities and the Council of Europe in order to ensure their awareness of standards initiatives, and to develop a plan for testing and implementing emerging standards. To provide further opportunities for dialogue among organizations and projects interested in the development of standards, AHIP plans to convene roundtable meetings in the coming year (one will be held in Latin America, another in Europe). Long-range plans include an international conference on standards.

Clearly, the stage is being set for international collaboration in the development of art information standards. To play a part in this effort is an opportunity none of us should overlook. It is also important to remember that if the research potential of automation and the implementation of information networks are to be realized, much more dialogue is needed between the communities that create and maintain art information and those that consult and use it.

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[9] The International Museum and Cultural Heritage Documentation Standards Meeting, sponsored by the Getty Art History Information Program (AHIP) and the Documentation Committee of the International Council of Museums (CIDOC), held in Canterbury, England 7-8 September 1991.
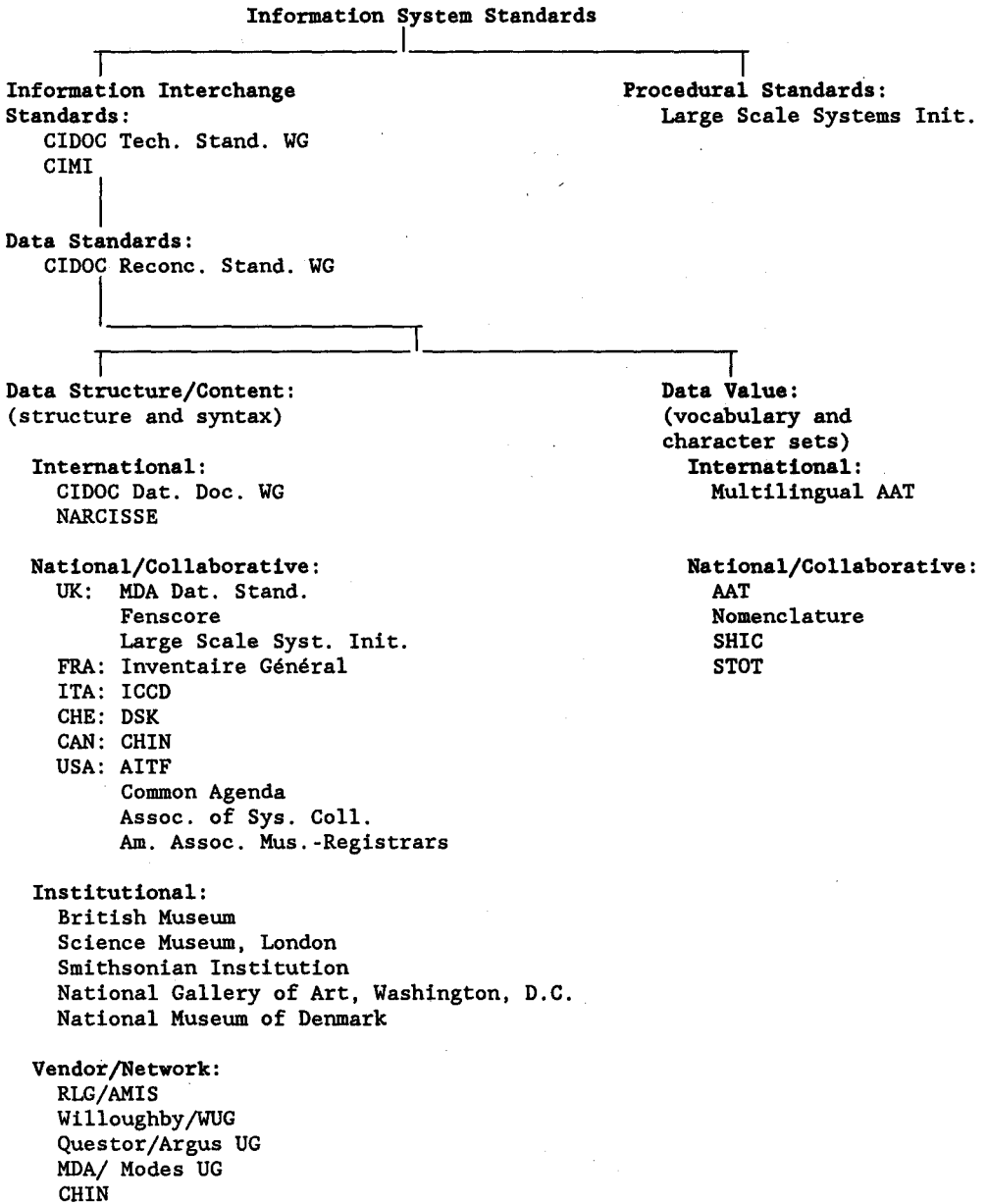
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                    Information System Standards
         ┌───────────────────────────┴─────────────────────┐
Information Interchange                          Procedural Standards:
Standards:                                         Large Scale Systems Init.
   CIDOC Tech. Stand. WG
   CIMI
   │
   │
Data Standards:
   CIDOC Reconc. Stand. WG
   │
   ┌──────────────────────────┴──────────────────────┐
Data Structure/Content:                         Data Value:
(structure and syntax)                          (vocabulary and
                                                character sets)
   International:                                  International:
      CIDOC Dat. Doc. WG                              Multilingual AAT
      NARCISSE

   National/Collaborative:                         National/Collaborative:
      UK:  MDA Dat. Stand.                             AAT
           Fenscore                                    Nomenclature
           Large Scale Syst. Init.                     SHIC
      FRA: Inventaire Général                          STOT
      ITA: ICCD
      CHE: DSK
      CAN: CHIN
      USA: AITF
           Common Agenda
           Assoc. of Sys. Coll.
           Am. Assoc. Mus.-Registrars

   Institutional:
      British Museum
      Science Museum, London
      Smithsonian Institution
      National Gallery of Art, Washington, D.C.
      National Museum of Denmark

   Vendor/Network:
      RLG/AMIS
      Willoughby/WUG
      Questor/Argus UG
      MDA/ Modes UG
      CHIN
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Fig. 2 - Examples of Museum and Cultural Heritage Documentation standard project.

ACRONYMS AND ABBREVIATIONS USED IN FIGURE 2

AAM - American Association of Museums
AAM Registrars' Committee
AASLH - American Association for State and Local History
AAT - *Art and Architecture Thesaurus*
AITF - Art Information Task Force
ALHFAM - Association of Living Historical Farms and Agricultural Museums
ASC - Association of Systematics Collections
The Revised Nomenclature for Museum Cataloguing. James R. Blackaby, Patricia Greeno, and the Nomenclature Committee,
eds. Nashville, TN: AASLH Press, 1988.
CHIN - Canadian Heritage Information Network
CIDOC - International Documentation Committee of the International Council of Museums (ICOM)
CIDOC Doc. Stand. WG - CIDOC's Documentation Standards Working Group
CIDOC Recon. Stand. WG - CIDOC's Reconciliation of Standards Working Group
CIDOC Tech. Stand. WG - CIDOC's Technology Standards Working Group (1980-1985)
CIMI - Computer Interchange of Museum Information
Common Agenda *for History Museums* - a program of the AASLH
DSK - Datenbank schweizerischer Kulturgüter
FENSCORE - Federation for Natural Sciences Collections Research
ICCD - Istituto Centrale per il Catalogo e la Documentazione
Inventaire général des monuments et des richesses artistiques
LASSI - Large Scale Systems Initiative
MDA - Museum Documentation Association
MDA/Modes UG - MDA Modes User Group
MDA Data Standard. Revised edition. Cambridge, U.K.: Museum Documentation Association, 1991.
NARCISSE - Network of Art Research Computer Image SystemS in Europe
Questor/Argus UG - Questor/Argus User Group (Questor Systems)
RLG - Research Libraries Group, Inc.
RLG/AMIS - Research Libraries Group/Archives and Museums Information System
SHIC - Social History and Industrial Classification
STOT - Science and Technology Object Thesaurus
WUG - Willoughby Users-Group Electronic Network (Willoughby Associates)