# MARC INTERNATIONAL

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*The cooperative development of the Library of Congress MARC II Project and the British National Bibliography MARC II Project is described and presented as the forerunner of an international MARC network. Emphasis is placed on the necessity for a standard MARC record for international exchange and for acceptance of international standards of cataloging.*

This paper is an examination of two major operational automation projects. These projects, the Library of Congress MARC II Project and the British National Bibliography (BNB) MARC II Project, are the result of sustained and successful Anglo-American cooperation over a period of three years during which there has been continuous evaluation and change. In 1969, for a brief period, the systems developed have been stabilised, partly to give time for library systems to examine ways and means of exploiting a new type of centralised service, and partly to give the Library of Congress and the British National Bibliography the opportunity to look outwards at other systems being developed in other countries. There has, of course, already been extensive contact and exchange of views between the agencies involved in the planning and developing of automated bibliographic systems and the possibilities of cooperation and exchange have been informally discussed at many levels. The time has now come for the national libraries and cataloguing agencies concerned to look at what has been achieved and to lay the foundation for effective cooperation in the future.

The history of the Anglo-American MARC Project began at the Library

of Congress with an experiment in a new way of distributing catalogue data. The traditional method of distributing Library of Congress bibliographic information is to provide catalogue cards or proof sheets. These techniques will undoubtedly continue indefinitely into the future, but the rapid spread of automation in libraries has created a new demand for bibliographic information in machine readable form.

The original MARC project (1) was "an experiment to test the feasability of distributing Library of Congress cataloguing in machine readable form". The use of the word "cataloguing" underlines the essential nature of the MARC I project; its end product was a catalogue record on magnetic tape. There is a very significant difference between a catalogue record on magnetic tape and a bibliographic file in machine form. The latter does not necessarily hold anything resembling a catalogue entry, although MARC II still reflects, both in the LC implementation (2,3) and in the BNB implementation (4,5), a preoccupation with the visual organisation of a catalogue entry. Fortunately retention of the cataloguing "framework" does not hinder the utilisation of LC or BNB MARC data in systems designed to hold and exploit bibliographic information, as the whole project is designed as a method for communication between systems. The essence of the MARC II project is that it is a communications system, or a common exchange language between systems wishing to exchange bibliographic information. It is highly undesirable, in fact quite impossible, to plan in terms of direct compatability between systems. Machines are different, programs are different, and local objectives are different.

The exchange of bibliographic information in any medium implies some level of agreement on the best way to organise and present the data being exchanged. The need to use a fairly standard type of bibliographic structure on a catalogue card is obvious enough, and over the years a form of presentation, as best exemplified by a Library of Congress catalogue card, has been developed which holds all the essential data and also, by means of typographical distinctions and layout, conveys the information in a visually attractive style. When bibliographic information is transmitted in a machine readable form the question of visual layout does not arise but the question of structure is vitally important. This structure is called the machine format and the machine format holds the data. It literally does not matter in what order the various bits and pieces that make up a catalogue record appear on a magnetic tape. What does matter very much is that the machine should be able to recognise each data element: author, title, series, subject heading, etc. In practice, either each data element must be given an identifying tag that the machine can recognise, or each data element must occupy a predetermined place in the record. In view of the unpredictable nature of bibliographic information, the former method—that of tag identification—is now widely used and is the technique adopted in the MARC system.

The LC and BNB MARC systems are two very closely related implementations of a communications format which in its generalised form has been carefully designed to hold any type of bibliographic information. The generalised format description is now being circulated by British Standards Institute and United States of America Standards Institute. It can be very briefly described as follows:

| LEADER | DIRECTORY | CONTROL FIELD(S) | DATA FIELDS |
|---|---|---|---|

The leader is a fixed field of 24 characters, giving the record length, the file status and details of the particular implementation. The directory is a series of entries each containing a tag (which identifies a data field), the length of the data field in the record, and its starting character position. This directory is a variable field depending on the number of data elements in the record. The control fields consist of a special group of fields for holding the main control number and any subsidiary control data. The data fields are designated for holding bibliographic data. Each field may be of any length and may be divided into any number of subfields. A data field may begin with special characters, called indicators, which can be used to supply additional information about the field as a whole.

It can be seen that the basis of MARC II is a very flexible file structure designed to hold any type of bibliographic record. Once such a level of compatability is established it is possible to prepare general file handling systems (6) which will convert any bibliographic record to a local file format. There is certainly much scope for agreement on local file formats as well, but such formats will necessarily be conditioned by the type of machine available and the use to be made of the file.

The establishment of a generalised file structure is a great step forward but by itself means very little unless a wide measure of agreement can be reached on the data content of the record to be exchanged. Here the responsibility for cooperation and standardisation shifts from the automation specialist to the librarian, and particularly to those national libraries and cataloguing agencies who can by their practical actions assist libraries to implement the standards prepared for the profession.

In order to appreciate the real importance of standardisation, particularly in the context of the MARC Project, it is necessary to look a few years into the future. It is inevitable that the rapid spread of automated systems in libraries will create a demand for machine readable bibliographic records and that in turn will lead to the setting up of bibliographic data banks in machine readable form in national and local centres. These data banks will be international in scope and will contain many millions of items. In the long run the only feasible way to maintain them is for each country or group of countries to develop automated centralised cata-

loguing systems for handling their own national outputs and to receive from all other countries involved in the network machine readable records of the latter's national outputs. Countries cooperating on this basis must agree on standards of cataloguing (and ultimately on standards of classification and subject indexing), so that the general data bank presents a consistently compiled set of bibliographic data. There is no doubt that national data banks will be set up. Libraries today are faced simultaneously with a rapid increase in book prices, a need to maintain ever-increasing book stocks to meet the basic requirements of their readers, and a persistent shortage of trained personnel to catalogue their purchases. These trends are already well established and in the United States, where they are most advanced, the result has been the massive and highly successful Shared Cataloguing Program. Historically the Shared Cataloguing Program will probably be seen as the first and last attempt to provide a comprehensive bibliographic service by unilateral action. A large number of countries have cooperated in this attempt but the Shared Cataloguing Program does not rest on the principle of exchange. It is doubtful if even the United States will be able to maintain and extend this programme in its present form. The Shared Cataloguing Program must ultimately be replaced with an international exchange system.

National machine readable bibliographic systems will be established, but there is a grave danger that those agencies responsible will be primarily concerned only with the immediate problem of producing records suitable for use in their own national context or for their own national bibliography, regardless of the fact that the libraries and information centres they need to serve are acquiring ever-increasing quantities of foreign material. The exchange principle will be downgraded to an afterthought, a by-product of the fact that an automated system is being used.

If this outcome is to be avoided, international standards must be prepared and national agencies must accept them instead of only paying lip service to them. In the past librarians have tended to be more concerned with codification than standardisation, but in the field of cataloguing at least a great breakthrough was made sixteen years ago when Seymour Lubetzky produced his "Cataloguing Rules and Principles; a Critique of the A.L.A. Rules for Entry and a Proposed Design for Their Revision" (7). The work of Lubetsky led to the "Paris Principles" (8) published by IFLA in 1963 and in due course to the preparation of the "Anglo-American Cataloguing Rules" 1967 (9). These rules, though unfortunately departing from Lubetzky's principles in one or two areas provide a solid basis for standardisation. We are fortunate to have them available at such a critical moment in the history of librarianship. They must form the basis of an international MARC project.

Of all the great libraries of the world, the Library of Congress has done more than any other to promote international cataloguing standards. It is now in a uniquely favourable position to promote these standards

through its own MARC II Project. The LC MARC II project, together with the BNB MARC II project, can provide the foundation of the international MARC network. These projects alone cover the total field of English language material and yet already the basic requirement of standardisation is absent.

The Library of Congress finds itself unable, for administrative reasons, to adopt fully the code of rules it worked so hard to produce and which British librarians virtually accepted as it stood in the interests of international standardisation. That a great library should be in this position is understandable. What is less understandable is that the Library of Congress should transfer the non-standard cataloguing rules established by an internal administrative decision to prescription of cataloguing data in the machine readable record that it is now issuing on an international basis. One of the great advantages of machine readable records is that they can simultaneously be both standard and non-standard. There is no reason that the Library of Congress, or any national agency, should not provide for international exchange a standard MARC record together with any local information the Library might want. If as a result other national agencies are encouraged to do the same, it will not be long before the absurdity and expense of examining each record received via the international network in order to change a standard heading to a local variant, will become apparent. The British National Bibliography has already accepted the Anglo-American code and by this action has now done much to promote its acceptance in Great Britain. Incomplete acceptance of the code is really the only significant difference between the two MARC projects.

At a detailed level there are differences in some of the subfield codes. These are chiefly due to the fact that the British MARC Committee was particularly concerned with the problems of filing bibliographic entries, and as no generally accepted filing code exists it was decided to provide a complete analysis of the fields in headings. This analysis will enable the BNB MARC data base to be arranged in different sequences to test the rules now being prepared. The other difference, or extension, in the British MARC format is the provision of cross references with each entry, on the assumption that in a MARC system a total pack of cataloguing data should be provided. However these differences reflect the experimental nature of the British project, not the fundamental differences in opinion.

In this paper an attempt has been made to look at the British and American MARC Projects not as systems for distributing bibliographic information but as the forerunners of an international bibliographic network. Intensive efforts have been made to lay a foundation for this international network. The Anglo-American code provides a sound cataloguing base, the generalised communications format provides a machine base, and the Standard Book Numbering System provides an international identification

system. These developments are all part of a general move towards real cooperation in the provision of bibliographic services. They must now be brought together in an international MARC network.

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