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COMMON FORMAT FOR MACHINE READABLE BIBLIOGRAPHIC RECORD FOR INDIA: A PROPOSAL \*

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A proposal for a national standard for bibliographic information on magnetic tape both for information services and the library community in India is presented. The format is based on MARC and the UNISIST-RM. The structure of the format is as defined in ISO 2709 - 1973 and the content designators are formed using a three character numeric tag, a six character indicator and a two character subfield identifier. The third character position in the indicator is used as a repeat count the fourth, fifth and sixth character positions. are used to indicate the length of the field of that repetition. The format includes many coded information to cater to the requirements of the computer-based information system for Science and Technology, that is being developed in India. It is proposed to use ISBDs for choice and form of data items and use International standards for the character set for the representation of the data items. It is indicated that this format could be transformed into that of an international standard for exchange purpose by

<sup>\*</sup> Based on a paper presented at the International Symposium on Bibliographic Exchange Formats, Taormina, Sicily, 27-29 April 1978.

format transformation process. A complete set of tags, indicators and subfield identifiers and a table of UNISIST-RM data elements that correspond to the proposed format are given.

#### 0 INTRODUCTION

The basic components of a machine readable bibliographic record are:

- I) the physical representation of the bibliographic data in a definite structure;
- ii) the content designators (the tags, indicators and subfield identifiers) which identify the data elements or provides additional information about a data element;
- iii) the contents which are the data elements themselves;
  - iv) the character set that is used to represent the data elements; and
    - v) codes for specific data items such as language, country, etc. (2).

Of the above mentioned components, the structure of the record has been almost similar adhering to ISO-2709-1973 but the other components vary in different systems. To achieve the transformation of one format into that of another or into that of an international standard by computer processing with appropriate software, a certain amount of similarities in the representation of the other components is also necessary.

Recently the Department of Science and Technology, Government of India, has launched a planned programme - National Information System for Science and Technology (NISSAT). Under this plan, area-wise national information centres for leather, food, machine tools etc. (1) are being established with a view to provide computer based information services, and make the created machine readable bibliographic data base exchangeable between these and other information centres.

This paper proposes a national standard for bibliographic information exchange on magnetic tape to be useful both for information services and the library community in India. This has been arrived at by a study of the MARC (11), UNISIST-RM (27) DEVSIS (5) the report by A Lebowitz (8), and the distinctive features and requirements of the computer-based information system being developed for the NISSAT.

#### 1 BASIC ELEMENTS OF' THE RECORD

The structure of the record is as defined in ISO-2709-1973, having a leader, directory and variable data fields. At present, a three character tag, a six character indicator and a two character subfield identifier are proposed. The data elements are developed taking into consideration the MARC as the basis. They are grouped into functional blocks as per the cataloguing practice in India (20), almost reflecting the functional block structure proposed by Avram (2). The main features of the format of the record are described below.

#### 2 LEADER

The character positions 0-4 specify the record length and character position 5 the record status. Character positions 6 and 7 are reserved for categories of the document and character position 8 for bibliographical level using Ibinary bit setting technique as suggested by Lebowitz (8). Character positions 10 and 11 give the indicator length "6" and subfield identifier length "2" respectively Character positions 12 to 23 are as given in UNISIST-RM.

#### 3 TAGS AND INDICATORS

The tags used for the variable data fields are 'three character numeric' codes like those of MARC with minor variations (24). The indicators are 'six character alphanumeric' codes. Positions 1 and 2 of the indicator are used to denote the type of data entered. For example, in tag 008 if the indicator is 00 then the work is a translation; if it is 01 the work contains translation of summaries; if it is bb the work is none of the above. Position 3 of the indicator is used to serve as a count to indicate how many number of times the same indicator within the tag is repeated (repeat count). For example, a '3' in character position 3 of an indicator denotes that, that indicator is repeated three more times in the same field. The next repetition of the indicator will have a '2' in character position 3 to denote that there are two more repetitions of the field, a '1' in the next repetition to denote that there is one

more repetition of the field and a '0' (zero) for the last repetition to denote that there are no more repttitions of the field. In other cases all the three positions in the indicator are set to blanks. It should be noted that R E Coward has suggested that the provisions made in the EUSIDIC format for a fourth information field in a directory entry could be used for repeat information of the tags (4). Also INTERMARC has, apart from the usual two processing indicators, a repetition and a relation indicator (13). The fourth, fifth and sixth character positions of the indicator are used to denote the length of the field indicated.

#### .4 DATA FIELDS

## 41 Control Information Block

Tag 001 is the issuing agency's control number. Tag 005 identifies the data base, its volume and issue number and the date of issue. The subfields in this field are

- \$a Data base identification
- Sb Volume and issue number
- \$c Date of issue

Tag 006 is the National Bibliography Number and Tag 007 contains the input centre code. The indicators in this block are all set to blanks.

#### 42 Coded Information Block

This block contains most of the data items given in the fixed data field - Tag 006 - of MARC as separaxe subfields as suggested by a Lebowtiz (9). The indicator for

this field is 00 if the document is a translation; 01 if it contains text in different languages; 11 if it contains translation of summaries and is bb if otherwise. The suggested subfields are given in Appendix-A.

Tag 009 contains coded information about the type of document. The subfields in this field are:

- \$a Illustration codes
- \$b Form of contents codes
- \$c Literature codes
- \$d Biography codes
- \$e Form of reproduction codes

A set of codes for this field is being worked out using the codes in different systems and the depth schedule for the classification of 'Book Science' (23)-

### 43 Identification Block

## Standard Codes Section

Tag 045 contains in separate subfields the ISBN, ISSN, CODEN and other codes such as ISCN (International Standard Conference Number). The ISCN is constructed according to the guidelines suggested by Prof A Neelameghan (17). Some of the items forming part of the ISCN are:

- nature of the conference international
   or national if national, the country code;
- 2) subject area code of the conference;
- 3) code to denote whether the conference is 'adhoc' or periodical;
- 4) year of the conference;

- 5) individualising digit for conference held in the same year in the same subject; and
- 6) a check digit.

## Leading Section

Tag 046 contains the Class Number and the Book Number as two separate subfields. The first two positions of the indicator are used to denote the scheme for classification used. For example:

046 CC \$a Colon Class Number \$b Colon Book Number

Tag 050 contains Coded Control Information for standard, patent, report and research project. Indicator position 1 is set to zero; position 2 is used to denote the following:

- 1 Standard
- 2 Patent
- 3 Report
- 4 Research project

The subfields used are given in Appendix-A. For tag 050 [03] - Standard Report Code, guidelines are being developed suggesting

- 1) ISIN (international Standard Institution Number) (17) for the organisation under whose auspices the report is generated;
- 2) acronym for the unit/division within the larger parent organisation;
- 3) type of report code such as 'SR' for survey report, 'TM' for technical memorandum etc.

- 4) date of report (year month); and
- 5) report number.

If two or more organisations jointly issue the report this field is repeated.

Tag 050 [04] - the Standard Project Code is sonstructed according to the suggestion presented at the UNISIST International Symposium on Information Systems and Services in Ongoing Research Science (16).

The tag 050 with the different codes for standard, patent, report and research project is assigned for a variety of applications such as

- compilation of directory of institutions, research projects;
- 2) compilation of bibliography of reports; and
- answers to certain type of queries such as the number of projects completed by an organisation during a specified period, the number and types of reports generated by an •rganisation within a specified period etc that could be answered by processing this field alone (17).

This field is provided mostly for processing within India and is optional when the data base is exchanged outside India.

### 44 Intellectual Responsibility Block

The data elements in this block are similar to that of MARC with minor variations. In tag 100, the indicator

positions 1 and 2 are set to "blank if uniform title of the document is to be used as the heading of the main entry (22). The indicator position 1 is set to zero to denote primary authoriship and set to one to denote secondary authorship (21). The indicator position 2 is set to zero to denote single authorship and to one to indicate multiple authorship.

## i.e. Indicator position 1:

- 0 Primary author
- 1 Secondary author

Indicator position 2:

- 0 Single author
- 1 Multiple author

In the case of personal author (Tag 100), titles associated with the name of the author, pseudonyms, former names, affiliation etc. are given as subfields. Tag 110 and 111 are as given in MARC but for the indicators and the subfield \$t. (See Appendix-A).

## 45 Descriptive Block

## Title Section

This block contains the title of the document with various forms of the title as subfields. The edition and volume statements are given as separate tagged fields. Tag 205 contains information about editors, translators of periodicals and serials.

Tag 250 contains information about research projects. It is the expansion of Tag 050 [04] - the Standard Project Code. The sub-fields in this field are given in Appendix-A.

Tag 260 contains the imprint and tag 300 collation. Tag 310 contains the price of the document, with subfields for the different currencies.

## Host Document Section

Tag 350 is used to identify the host document in which the document under consideration occurs as a part. The sub-fields in this field are

- Sa Name/title of the host document
- \$b Volume number/Fart number
- \$c Issue number/Chapter number
- \$d Pagination
- \$e Date
- \$f Other identification, if any
- Sg ISBN/ISSN etc. of the host document.

## k6 Notes Block

The notes block contains tagged fields for the various notes used by the Library Community. The tags are as in MARC except for three additional notes. They are:

- tag 503 Change of title note
- tag 506 Loose attachments note
- tag 507 Availability of document note

## 47 Subject Analysis Block

Tag 600 contains the subject headings assigned to the document. The first two positions of the indicator are used to denote the system used in deriving the subject headings using a two character alphabetic code. The first two positions are set to zero for key words. Each keyword is given as a repeatable subfield.

Tag 700 contains synopsis or abstract.

#### 48 Local Use Block

The local use block contains specific data items for local processing. Tag 900 contains the ordinal value of the 'preferred class number<sup>1</sup> assigned to the document, such that a classified list of the data base could be printed by sorting the records using this field as the key.

Tag 910 contains class numbers. If more than one foci (aspect) of the subject is discussed in the document, then each of the food is assigned a class number. The indicator position 1 is set to zero and indicator position 2 is used to denote whether the class number is the preferred one or not.

Indicator position 2

0 - Preferred class number

1 - Non-preferred clas number

Note: In general the preferred class number will be the same as that given in tag 046 [CC] and the scheme for classification will be the Colon Classification.

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Tag S20 is used for Sector Codes that indicate the broad areas such as Aeronautics, Building, Chemical technology, Coal, Electronics, Food Technology, Glass and ceramics, Instrument technology, Leather technology, Medicinallplants, Metallurgy, Mining industries, Oceanography, Petrochemicals, Pharmaceuticals, Public Health, Transport etc (14) - the sectors in which the NISSAT is establishing information centres. Tag 950 is reserved for Postulate Based Permuted subject Index (POPSI) (3,18) full representation, so that it could be used for construction of thesaurus and other information retrieval tools.

#### 5 DATA ITEMS AND CHARACTER SETS

The co-occurrence of a data element identified by its name and definition of it need not necessarily imply interchangeability if the choice and form of rendering of the data item does not lend itself to be mutually interchangeable (10). Hence it is important that a standard code for choice and form of data items are adopted.

IFLA's Committees on 'Cataloging' and on 'Serial Publications' have brought out International Standard Bibliographic Description for monographic publications (IS3D-M) and 'International Standard Bibliographic Description for serials (IS3DS). The ISBD ... is designed to meet three requirements for the efficient international use of (bibliographic) records, they are:

the records produced in one country or by the users of one language be easily understood in other countries ana by users of other languages;

- 2) the, records produced in each country be integrated into files or lists of various kinds containing records also from other countries; and
- 3) the records in written or printed form be converted into machine-readable form with minimum of editing (26).

It is proposed that ISBD-M and ISBD-S be used for the choice and form of data items in the record. If necessary a standard could be evolved taking into consideration the lavs, canons, principles and rules prescribed for bibliographic description in the Classified Catalogue Code also (20).

It is proposed that the character set to be used may be the set developed by the UNISIST/iCSU-AB Working Group on Bibliographic Description, based on ISO Recommendation 646-1973 or the standard being developed by the Working Group of ISO/TC46. For transliteration of Indian languages, standards have to be developed by the Indian Standards Institution.

#### 6 CODES FOR SPECIFIC DATA ITEMS

The codes for country may be assigned using ISO Recommendations (6) (7) or those developed by DEVSI3 Study Team (5)- For others such as illustration, form of content, form of reproduction etc., codes are to be worked out using UNIMARC and other systems.

### 7 COMPATIBILITY

Compatibility or exchangeability between two formats in essence leads to the question whether the bibliographic records in both the formats could be made identical by computer processing using an' appropriate software. This again is possible, provided the data elements forming the basic building blocks of the formats, are distinctly and uniquely identifiable and the choice and form of the data elements lend themselves for the transformation from one format to the other. In other words, if all the data elements required in Format—A are available in Format—B in the form in which each of them is required or available in a form that could be transformed into the form in which each of them is required, and if each one of the data elements is uniquely identifiable, then both the formats are interchangeable whether the structure of the formats are the same or not.

Hence, if it is a question of ihter-changeability alone, what is important is the presence, form and identifiability of each of the data elements. It would be even more helpful to have unique tags for each of the data elements - the fundamental elementary constituents - of a bibliographical record and use them as 'tags' and 'data elements' for interchange purpose. But in that case, the tags should be symbolic of the data elements they designate, and that, for library applications some other items of information may have to be added.

Essentially an international standard is a distillation at the international level the various national standards. At a practical level, it must also be recognised that various implementations of the international standard are widely used for interchange purposes (A). It is a common practice among information retrieval systems to have different programs to convert the different formats of data bases into a single format and use this format, for peanch and retrieval (19). TBSIB practice is seeping into the services of the library community also. The British Library is developing MERMARC, as a neutral format in which by a process of tag translation it is possible to handle internally, records which are externally represented as LCMARC, UKMARC and any other format that might reasonably be expected to arise (25.)

The exchange of bibliographic information between users of different — incompatible or partly compatible formats presents the problem of "connecting" two different formats, or rather of establishing a one-to-one mapping of "Che specified elements of one format onto another. Theoretically, there is no difference between defining a translation procedure, a switching process between two different formats,

or replacing both by a common format: the problem of matching bibliographic data elements remains the same (12). But if a 'common format' for exchange purposes is established, then each country needs to have only two programs - one for converting their national format into that of the 'common format' and the other for converting

the 'common format' into that of their national standard. Also, "a common exchange format is an instrument for obtaining maximum exchangeability between any two formats'

Appendix - B presents - at a lower degree of specification - a table of UNISIST-RM data elements and content designators and the corresponding content designators in the proposed Indian format. This table could be further elaborated and analysed and brought up to the required degree of specification and be used as a switching device for purposes of format transformation.

### 8 CONCLUSION

For Information service purposes, the required data Items could be easily extracted from this proposed format and used. But for use in libraries it is to be examined whether this format is sufficiently flexible. The provision of repeat count as the third character in the indicator is to be examined to check its usefulness. It is also worth exploring the provision of giving repeat count for tags in the directory entry. This format is only a proposal and subject to revision, and change and it is hoped that the proposal will be fully analysed to bring out its shortcomings.

## 9 ACKNOWLEDGEMENT

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## APPENDIX-A

List of Data Elements

TAG	INDICATOR	SUBFIELD IDENTIFIER	DESCRIPTION
			CONTROL INFORMATION BLOCK
		bb	Issuing Agency's Control Number
005	bbbbbb	\$a Sb	Data Base Identification Code Volume and Issue No. of data base tape
		Sc	Date of issue of data base tape
006	bbbbbb	bb	National Bibliography Number
007	bbbbbb	bb	Input Centre Code
			CODED INFORMATION BLOCK
800	00bbbb		Work is a translation
	Olbbbb		Work contains text in different languages
	11bbbb		Work contains translation of summaries
		\$a	Date entered on file
		Sb	Type of publication date code
		\$c	Pubalication date 1
		Sd	Publication date 2
		Se	Intellectual level code
		\$f	Government publication code
		\$g	Modified record code
		\$m	Country of publication
		\$0	Language of text
		\$p	Language of intermediate text
		\$r	Language of summary
		\$s	Language of contents note

(a)	(b)	(c)	id)
		\$t	Languagg of title page if different from text
		\$u	Loca-tion of meeting
		\$v	Country of meeting
		\$f	Date of meeting (full)
009	bbbbbb	\$a	Illustration code
		\$b	Form of content code
		\$c	Literature code
		\$d	Biography code
		\$e	Form of reproduction code
			IDENTIFICATION BLOCK
			(Standard Codes Section)
045	00bbbb	\$a	ISBN
		\$b	ISSN
		\$c	CODEN
		\$n	Others such as ISSN
			(Leading Section)
046	xxbbbb		xx is abbreviation for the scheme for classification
	LCbbbb		LC Class number
		\$b	LC Book Number
050	Olbbbb		ISIN for issuing authority of standard
		\$b	Number of standard
		\$C	Year of publication or adoption or any other equivalent
		\$d	Name of country of origin code

(a)	(b)	(c)	(d)					
	02bbbb	\$a	Code for country of origin of patent					
			Patent number					
		\$c	Date of patent					
			Code for issuing authority of					
			patent					
	03bbbb		ISIN for issuing authority of					
			report					
			Report number					
		\$c	Year					
	04bbbb		ISIN for the organization carrying out the project					
		\$b	Code for country of origin of patent Patent number Date of patent Code for issuing authority of patent  ISIN for issuing authority of report Report number Year  ISIN for the organization carrying out the project Subject code					
			Code for country of origin of patent Patent number Date of patent Code for issuing authority of patent  ISIN for issuing authority of report Report number Year  ISIN for the organization carrying out the project Subject code Serial number of the project in the subject area in the institution Priority status code Nature of sponsorship code Nature of research code Cost of the project code Starting date Completion date Serial number of the project ISIN of sponsoring organisation  INTELLECTUAL RESPONSIBILITY BLOCK					
			Report number Year  ISIN for the organization carrying out the project Subject code Serial number of the project in the subject area in the institution Priority status code Nature of sponsorship code Nature of research code Cost of the project code Starting date					
		\$e	Priority status code					
			ISIN for the organization carrying out the project Subject code Serial number of the project in the subject area in the institution Priority status code Nature of sponsorship code Nature of research code Cost of the project code					
			Serial number of the project in the subject area in the inst- itution Priority status code Nature of sponsorship code Nature of research code					
			Starting date					
		\$j	Completion date					
		Sk	Serial number of the project					
		\$1						
			(Heading Section)					

(a)	(b)		(C)						
100	dddddd				Uniform title as heading/entry- element				
				Secondary element					
			\$C	Year					
	nnbbbb			Personal author					
Note:- Indicator			positi	on	1				
			1				rimary author		
					1	S	Secondary author		
Indicator position 2									
					O Single author				
						M	Multiple author		
			\$a	Surname					
				Forenames			1		
				Titles and other words associated with the name					
				Su	rna	me c	of pseudonym		
			\$e	For	ren	ames	of pseudonym		
			\$f	For	rme	er na	ame		
			\$B	Role that is, Ed. Comp; Tr etc,			is, Ed. Comp; Tr etc,		
			\$h				the organisation		
			\$i	Ado	dre	ss c	or location		
			\$3	Coi	unt	ry			
			\$n						

(a)	(b)	(C)	(d)
110	nnbbbb		Corporate author
			The indicators are as for tag
			The subfieids are as defined in MARC except for St. But includes the subfieids \$i, \$j and Sn given for tag 100 above
111	00bbbb		Conference or meeting
			The subfields are as defined in MARC except for \$k and \$t, But includes the subfields \$h, Si and \$m given for tag 200 below to denote the name in original language, transliterated' and translated respectively.
			DESCRIPTIVE BLOCK (Title Section)
200	00bbbb	\$a	Title of the document except periodical
		\$b	Title of periodical publication
		\$s	Alternative/variant title
		\$d	Sub-title Short-title/abbreviated title
		\$f	Uniformised title
		\$g	Half-title
		\$h	Title in' original language
		Si	Transliterated title
		\$0	Supplied title
		\$k	Supplied transliterated title
			Transited title

(a)	(b)	(c)	(d)
201	00bbbb	\$a \$b	Edition Additional Information, if any No. of volumes
	Olbbbb	\$u \$b	Volume number Additional information such as Part 1, Part 2 etc.
		\$c	Title of volume, if any
205	00bbbb		Editors, translators etc of periodicals and serials
		\$a	Role terms such as edited by, compiled by etc.
		\$b	Surname
		\$с	Forenames
		\$d	Additional information, if any
250	00bbbb		Project Information (Expansion of Tag 050 $[04b]$ .
			Name of the performing organis- ation
		\$b	Additional information such as address etc.
		\$c	Name of sponsor
		\$d	Cost of the project
		Se	Beginning date
		\$f	Expected termination date
		\$£	Degree level
		\$h	Name of the institution where the thesis/dissertation is submitted

## Devedason

(a)	(b)		(c)	(d)
			Si	Address of the institution
260		00bbbb	\$a \$b \$c	(Imprint) Name of publisher Place of publication Date of publication
300	OObbbb		\$a \$b \$c \$n	(Collation) Pa gination Illustration Size Notes
				(Ex: Magnetic tape, 2400 ft. 9 track, 800 bpi, standard label, volume serial numbei = DRTC01, Record format VB, Block size 6204/6208, No. of files 1. Contains bibliographic data).
310	00bbbb			Price
			Sa	In dollars .
				In sterling
			\$c	In rupees (Host document identification section)
350	00bbbb		\$	Heading of the host document (Name/Title of the host document)
			Sb	Volume/Part number
			\$C	Issue/Chapter number
			Sd	Date

(a)	(b)	(c)	(d)
		\$e Sf \$g	Pagination Other identification, ii any ISBN/ISSN of host document.
			NOTES BLOCK
400 410 411 440 501 504	0		As in MARC except for the indicators
503	00bbbb		Change of title note
506	00bbbb		Loose attachments note
507 508	00bbbb 00bbbb		Availability of document note Bibliography (No of references)
			SUBJECT ANALYSIS BLOCK .
600	nnbbbb	'nn'	refers to a two digit alpha code for the system of indexing
	PObbbb	Sa	POPSI
	PRbbbb	\$a	PRECIS
	00bbbb	Sa	Keyword(Subfield repeatable)
700	bbbbbb		Synopsis or abstract
800 900	to		Reserved for future use
900	00bbbb		LOCAL USE BLOCK Ordinal value of the preferred Colon Class Number
910	00bbbb	\$a	Colon Class Number
		\$b	Colon Book Number

(a)	(b)	(C)	(d)
	Olnbbb		Non-preferred class numbers ox each of the foci discussed in the document, 'n' is repeat count.
920	00bbbb		Sector code
950	00bbbb		POPSI full subject heading with indicators for the fundamental category

## APPENDIX - B

Table of data . elements from UNISIST-RM and the corresponding content designators of the proposed Indian format

Data Element	UNI	SIST-	RM	proposed Indian Format
ISSN	A01	(00)	0	045 (00) \$b
CODEN	A02	(00)	0	045 (00) Sc
Short-title	A03	(01)	0	200 (00) \$e
Series	A04	(00)	0	440 (00)
Volume Number	A05	(00)	2	350 (00) \$b
Year	A05	(00)	3	350 (00) \$d
Issue Number	A06	(00)	2	350 (00) \$c
Other identification of issue/part	A07	(00)	0	350 (00) Sf
Title of Contribution/ Volume/Monograph/ collection				
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