

SUMMARY DESCRIPTION OF THE INTER-CONTACT COMPUTER SYSTEM

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Introduction

The Union of International Associations (established in 1907) acts as a clearinghouse for information on international organizations, their concerns and their activities.

This information is processed into reference books such as :

- Yearbook of International Organizations
- Annuaire des Organisations Internationales
- Yearbook of International Congress Proceedings
- Annual International Congress Calendar
- Yearbook of World Problems, Integrative Disciplines and Human Development.

Although there are only some 3,000 active international organizations, the amount of information to be processed rapidly into typographical form suitable for printing is quite considerable. (The 1000 page Yearbook of International Organizations consists of some 9,000,000 characters). For this reason, since 1969 the UIA has been investigating and using a variety of computer systems to facilitate :

- processing of text information for print
- processing of indexes prior to and for print
- analysis of information for research purposes
- mailing systems for questionnaires to update existing information.

These requirements overlap extensively and a considerable effort has been made to achieve the right compromise between those which are economically viable and those which are of interest for research.

The following sections attempt to give some idea of the Inter-Contact system as it now stands, although further integration is possible when funds become available.

Types of Data

The types of data with which the UIA is concerned may be grouped as follows :

- entities such as : international organizations
 - international organization members
 - international organization meetings
 - international organization meeting report descriptions
 - world problems
 - intellectual disciplines
 - values
 - multilateral treaties
 - individuals associated with international organizations
 - international organization sub-units or departments.

- relationships such as :
 - relationship of other entities to an international organization
 - relationships between international organizations
 - relationship of other entities to world problems
 - relationship between world problems
 - relationship of other entities to intellectual disciplines
 - relationship between intellectual disciplines
 - relationship of other entities to values
 - relationship between values
 - relationship of multilateral treaties to other entities
 - relationship of individuals to international organizations
 - relationship of sub-units to international organizations
 - relationship between international organization sub-units
 - relationship of other entities to countries or nationalities
- indexes to entities such as :
 - subject/keyword indexes (in English, French, etc.)
 - entity name indexes (in English, French, etc.)
 - classified indexes grouping entities by various category systems
 - geographic indexes relating entity to country or nationality
 - abbreviation/acronym indexes (in English, French, etc)
- textual information such as :
 - description of entity (English text, French text)
 - address of entity.

Organization of Files

All files are held in order of a numeric reference code. This code is purely a sequence number and has no logical structure. The following sequences have been activated to date :

- international organizations ("A" sequence)
- world problems ("P" sequence)
- intellectual disciplines ("D" sequence)
- values ("V" sequence)
- multilateral treaties ("T" sequence)

There are three possible parallel files for each sequence :

- text descriptions (constituting the bulk of any publication)
- indexes and cross-references relating to the entity (held in this form to facilitate editorial checking against the parallel text file)
- mail addresses (where appropriate)

Maintenance of Files

Within each entity reference code on each file, the information is held in line number order. This is a convenience to facilitate correction of the files and in no way determines or restricts the way the information in such lines is used later. In particular, the line of the text file does not necessarily bear any relation to the line in the publication when the text is computer-justified and set.

The editors make normal proof corrections to a computer-produced proof of each file. These are incorporated onto the master tape via a mini-computer which can be used to correct individual characters, words, lines or suppress complete sequences of lines. (Incidentally the use of this machine makes it possible to simulate for the keyboarder the presence of either an English or a French keyboard).

When the proof-production and correction cycle is complete, the cleaned master-tape is processed on a third computer system to justify the text, make-up and number pages, and produce a drive-tape for a film setter. This provides film in a form suitable for printing through a conventional offset printer.

In the case of the index files, these must first be sorted into the individual indexes and within each into alphabetical order (except in the case of the geographical and classified indexes). Then each is treated like a normal text file.

Index/Cross-reference Files

From the file maintenance point of view, these files are handled by the same programmes and techniques as the text files. However, the editors and keyboarders provide these files with some degree of structuring. Each line is used to contain one index entry or cross-reference.

Within any such file a large number of indexes or cross-reference types may be set up. Each type is identified by an index number (There may be many entries under a given index number for a given entity on the file). The indexes usually refer to other entities in the same sequence. However the cross-reference may also refer to entities in other sequence files (see Example II).

Example I : Yearbook of International Organizations ("A" sequence)

The following index numbers may all appear together on the index proof sheet of one organization :

01	English keyword	(may be several entries with this
02	French keyword	" " numbers)
03	English name of organization	" "
04	French name of organization	" "
05	Acronym in any language	" "
90	3-digit code classifying the organization	"
91	10-digit geographical location code	"
95	5-digit country of membership	"

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The index number may be followed by an asterisk if the entry relates to information from the body of the descriptive text rather than from the organization title. In this way component units of an international organization can be indexed. A similar technique is used to indicate whether an organization is classified primarily under one category, or secondarily under another as well. A "d" may be inserted to indicate that the organization is dead or inactive.

The manner in which the information is held permits the classified, geographical and membership indexes to be prepared either in English or French (or in another language if another index number series was activated).

Example II : Yearbook of World Problems, Integrative Disciplines and Human Development.

The programmes were designed with the organizations yearbook and the above-mentioned indexes in mind. This later five-part publication required the activation of further index number series to handle the extensive cross-referencing. (Cross-references between organizations will be added onto the "A" sequence file)

Text files are used for the problems, for the disciplines and for the values.

The following index numbers may appear on the index proof sheet for entities in each sequence (see Table).

Maintenance of Cross-references

The complex pattern of cross-referencing would normally impose a considerable burden on the editorial staff. By sorting the cross-references in various ways three checks can be made :

- that a reference from entity P to Q is matched by a back reference from Q to P (under the corresponding index number)
- that each such reference is made with the current version of the entity name
- that cross-references by name and without number may be checked against a keyword index to obtain a match wherever possible.

All but the last of these can be done by computer with only a visual check.

The cross-references from each entity, when checked, are fed by computer onto the end of the text description of each world problem, before the text file is computer typeset. (The indexes are stripped off as in the case of Example I).

Example III : Yearbook of International Organization Sub-Units (Hypothetical)

Using the above approach it is possible to envisage how a hypothetical new yearbook on the sub-units of international organizations might be handled by the Inter-Contact system. (This is a non-trivial example in view of the envisaged authority list of names of sub-units of international organizations which emit documents).

The publication might be in several parts :

Intergovernmental organization part : This could be extracted from the text tape of the Yearbook of International Organizations ("A" sequence). The text could then be re-edited and new material incorporated. Provision could be made for some of the material to be fed onto the end of each entry as cross-references. For example, index numbers might be used for the following

- government/political sub-units (in "S" sequence)
- secretariat sub-units (in "S" sequence).

Intergovernmental organization sub-unit part ("S" sequence). In this part would be fed all the text information on the individual sub-units of the intergovernmental organizations described in the first part. Each sub-unit would be given the next available number in an ascending sequence. Provision could be made for cross-references such as the following :

- intergovernmental organization of which it is a component ("A" sequence)
- sub-units to which it reports ("S" sequence)
- sub-units which report to it ("S" sequence)

This information would be fed onto the end of the textual description from the index tape after cross-checking.

Indexes part : In this part would be the following indexes, for example :

- English keyword index	(to "A" and "S" sequences combined)
- French keyword index	" "
- English unit name index	" "
- French unit name index	" "
- Acronym index	" "

Other types of index might also be considered. Of particular interest, might be an ISBN index to producing units.

If necessary the publication could also be produced with a French text, such that the Indexes part was common to both language editions.

Example IV : Concept Network Dictionary for the Social Sciences (Hypothetical)

Using the above approach it is possible to envisage how a hypothetical new dictionary on the conceptual structure of the social sciences could be produced by the Inter-Contact system. (This is a non-trivial example in view of the planned extension of the UNESCO/ICSU UNISIST World Science Information System to the social sciences, and the conceptual

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problems which have to be clarified as evidenced by the work of the Committee on Conceptual and Terminological Analysis of the International Political Science Association (*).

The publication might be in several parts :

Concept description part : This would consist of a an ascending sequence ("C" sequence, possibly) of numbered concept entries, in which a description of the concept was given, plus any words normally used to name the concept. If, or when, some degree of consensus had been reached on the term to be used in naming the concept, this would be added in a suitably distinctive form (The term becomes the concept name, and synonyms or related words become keywords by which the entry is indexed). Similarly, when some consensus had been reached on the definition of the concept, this would also be added in a distinctive manner. Needless to say several alternative wordings could be given.

The entries in this section would also have the cross-references fed onto them as in the case of the previous example. Two approaches could be used. Those cross-references on which there is a reasonably wide consensus could be fed onto the entries as just described. This is also true for clearly defined alternatives (e.g. minority viewpoints). But in the case where a completely different approach is advocated, this could be handled in one (or more) separate sequence(s) which could be internally consistent but would cross-reference the main sequence wherever possible or relevant. In such a way, specialized sequences could be maintained for different social science perspectives, such as :

- political science
- sociology
- anthropology
- psychology

or even for major schools of thought within such disciplines. But each such specialized sequence would have the opportunity of cross-referencing the others and the common sequence on which there is consensus.

Alternative concept descriptions part : As mentioned above this would consist of one or more alternative sequences of concepts, together with their internally consistent cross-references. Wherever possible they would cross-reference the main sequence or one another.

(*) For argument see COCTA Working Papers and

- Giovanni Sartori. Concept misformation in comparative politics. American Political Science Review, December 1970.
- Giovanni Sartori. Interconnected information and knowledge representation in the social sciences. (Paper submitted to an UNESCO expert meeting on the extension of UNISIST to the social sciences, Valescure, 1974).

For operational approach see :

- Anthony Judge. Relationships between elements of knowledge ; use of computer systems to facilitate construction, comprehension and comparison of the concept thesauri of different schools of thought. Hawaii, Social Science Research Institute (COCTA Working Paper, 3) (Reproduced in an abridged form for the IPSA 9th Congress in Montreal, 1973), 150 p.

Indexes part : This would contain such common indexes to all sequences as :

- keyword synonyms indexes
- term/concept name indexes
- classified indexes (distinguishing different classes of concept such as entity, variable, relationship, etc)
- classified indexes (grouping concepts by the schools of thought which use them)

Other types of index might also be considered. If necessary each alternative sequence could have its own indexes as envisaged for Example II.

The cross-references which would be maintained for editorial purposes on the computer index tape, could be of many types and arranged in a variety of distinct systems, including the following :

- | | |
|--------------|--|
| Hierarchical | : concept(s) of which it is a component
concepts which are sub-components |
| Analytical | (system of 7 relationship types) |
| Topological | (system of 5-plus relationship types) |
| Historical | earlier concept(s)
later concept(s)
parallel concept(s) |
| Educational | simpler concept(s) concerning same phenomenon
more complex concept(s) concerning same phenomenon
erroneous concept(s) concerning same phenomenon |
| Opinion | erroneous alternative concept(s) |

Research possibilities

Once information is collected on entities and relationships in the manner defined above, there are many research possibilities.

In the case of the text files, it is possible to use content analysis programs (particularly in order to develop more detailed keyword indexes)

In the case of the index files, it is possible to :

- produce statistical data on categories of entities or relationships (with entities of the same or different type)
- use special programs to analyze networks of inter-related entities to examine network characteristics such as : centrality, coherence, range, direction, durability, etc.
- plot out onto paper, under computer control, the current status of data on particular hierarchies of entities (possibly as a working document to facilitate revision)
- plot out onto paper, under computer control, significant networks of entities (as a means of facilitating comprehension of their complexity)
- examine entity hierarchies and networks on interactive computer graphics devices which permit direct interrogation of the files (possibly with the ability to display on demand the relevant text file information on the entity).

Programs have not yet been designed for these possibilities. It is hoped to encourage research institutes to develop special programs to handle the tapes for their own research purposes.

Data quality

It is important to stress the dialogue feature by which the material is incorporated onto computer tape from which a publication (or working document) is produced which can be updated to permit a revised version to be made available. By maintaining this process, the quality of the data can be continually improved. In a sense the system is a knowledge-representation system rather than a document production system (*), although the production and sale of publications as a by-product renders the system economically self-supporting.

Flexibility

The flexibility with regard to content has been stressed above. Programs have already been developed however to extract (on request or under contract) from any sequence a sub-group of entities which can then be incorporated into a "mini-publication". For example, the Yearbook of International Organizations data could be printed in a series of mini-directories by subject, by country of headquarters or membership, by organization type, etc. The indexes are extracted in the same way and require no extra processing.

It is also important that the system permits tentative formulations to be inserted (e.g. proposed cross-references or text descriptions) and used only to produce working documents via which they are reviewed. When approved, they can then be allowed to go through to publication.

At any time extra indexes in other languages can be added, or the text of a particular sequence can be translated into another language as has just been done for the *Annuaire des Organisations Internationales*.

(*) On this point see Anthony Judge. Texts or concepts ; documentation or knowledge ?. *International Associations*, 26, 4, 1974, p. 205-208.

: Problems	: Disciplines	: Human Dev.	: Organizations	: Treaties
: Part				
: ("P" sequence)	: ("D" sequence)	: ("V" sequence)	: ("A" sequence)	: ("T" sequence)

INDEXES

<u>Keyword</u>	01-English 02-French	01-English	01-English	01-English	01-English
<u>Title/Name</u>	03-English			03-English	03-English

CROSS-REFERENCES

<u>Framework</u>	50-Contextual 51-Subsidiary 52-Associated	50-Contextual 51-Subsidiary 52-Associated	50-Contextual 51-Subsidiary 52-Associated
<u>Analytical</u>	55-Displaced 56-Displaced by		
<u>Network</u>	60-Aggravated 65-Aggravating 62-Alleviated 63-Alleviating		

OTHER SEQUENCES

<u>Other entities</u>	20-Intergovern- mental Org.				
	21-International nongovernmen- tal organiz.				
	22-Other organiz. 19-Treaties	22-Other organiz. 19-Treaties	22-Other organiz. 19-Treaties	22-Other organiz. 19-Treaties	22-Other organiz. 19-Problems
	30-Disciplines	30-Problems	30-Disciplines	30-Disciplines	
	35-Values	35-Values	35-Problems	35-Values	35-Values

CLASSIFICATION

<u>Schemes</u>	90-Scheme	90-Scheme	90-Scheme	90-Scheme	90-Scheme
	91-Scheme	91-Scheme	91-Scheme	91-Scheme	91-Scheme
	92-Scheme	92-Scheme	92-Scheme	92-Scheme	92-Scheme
	93-Scheme	93-Scheme	93-Scheme	93-Scheme	93-Scheme