
REPORTS AND COMMUNICATIONS

Structures of Knowledge and Patterns of Order

Report on the 4th Annual Conference of the Society for Classification held in Salzburg, Austria, April 16–19, 1980.

This conference proved to be of a very high level – not only with respect to the thematic objective and the number of internationally well-known speakers participating but also concerning the overall design of the conference, which covered the whole range of classificatory work in terms of both areas of knowledge and problems to be solved.

The introductory remarks of W. Dahlberg expressed the intention underlying the formulation of the classificatory objective which was sought to be sketched when designing this conference: The world of knowledge as the total field of classificatory work, and the focus on structure when dealing with knowledge, esp. the concern about order in every aspect of it – as the structural and methodic foundation of classification as well as its ultimate goal – these basic characteristics of classification as a “new”, though everywhere already (unexpressedly) existing field of science were laid down to build the basis of this conference. The invitation of scientists from the various fields of learning under this thematically holistic and structurally order-oriented viewpoint was intended to give an insight into the range and profound meaning of the classificatory objective as well as to receive insights from the various fields for future classificatory work.

In response to this programme, six sections covering the universe of learning dealt each with the questions concerned from their respective points of view.

In Section 1, giving expression to the mathematical-physical point of view, Prof. Oberschelp started off on “Physical order of structures and mathematical structures of order.” He laid down principles allowing us to identify and/or create order. Nevertheless, mathematical description does not suffice to describe some aspects of our experience which are common to the physical world, such as optimization. The question remaining was: What principles if not the structural principles discussed must be discovered to not only understand nature in its optimal functioning, but also to operate on the same level of optimality when re-designing nature?

Papers by H. G. Körner on “Optimal class-division, the mathematical constant e and notational questions” and by Dr. W. Zwirner on “Patterns of knowledge in physics” gave insights into some recent developments regarding numerical and structural models and methods. Dr. Zwirner gave a survey on the mathematical models used for the description of elementary particles, H. G. Körner gave some evidence for optimal class-division, which numerically is in the region of e ($= 2,718. . .$), but may advance for other reasons even up to 5 or 7.

The papers by Dr. Degens on “Hierarchical classifi-

cation”, F. Jochum on “The determination of distances between semantic representational languages” and M. Koch on “Natural measures for distance and similarity – examples from the economical and social sciences” likewise dealt with numerical methods for classificatory purposes. Dr. Degens investigated in how far hierarchical structures may be discovered in nature – usually, he concluded, hierarchical structuring is more a product of our way of thinking than an underlying structure or reality. F. Jochum and M. Koch both demonstrated some ‘environmental’ aspects which give rise to the preference of certain measures of distance, as in the field of language or the social field. In response to the structurally-oriented Section 1, in Section 2, giving expression to the morphological-biological point of view, Prof. Bresch in his paper “Pattern of evolution – evolution of patterns” called attention to the subject of ‘pattern’. Pattern, as understood by Bresch, as a self-organizing, not merely formally, but rather content- and information-oriented whole, points to a possible clue to the open questions of Section 1. It seems as if a focus on patterns could open up a new realm of holistic understanding of science in general and classification science in particular. An open question here was whether there are underlying principles which may be assumed to govern the generation of patterns or whether this is merely a question of chance. The paper by Prof. Rösch on “Natura e scripta in lingua mathematica – numbers in nature and art” exemplified that indeed there are some very obvious, numerically “beautiful” principles to be seen in nature, which in turn play their part in artistic expression. Related to this perspective, Dr. Chr. Weinberger followed the question of “Homology and analogy as basis for biological hypotheses”: is there a true interlinkage of analogous and homologous relations – is our understanding of the evolution of species free of hypotheses?

Section 3, in turn, added further important insights, expressing as it did the physiological-psychological point of view. The focussing on man concentrated attention to an understanding of the importance or realizing that man himself must be conscious of himself as being in the focus of his world. Prof. Haase in his paper on “Patterns of order and order of patterns in developing the harmonical view of the world” gave a thorough example of holistically identifiable principles which may also be found in the psychological realm of the realization of harmonic proportions, the physiologic realm of their reception, which is likewise existent in our physiology, and the realm of the statements of the objective sciences concerning numerical facts of nature and the universe. It appears as if here lies a clue to the question of how to identify principles that govern the creation of patterns and/or to the question of correspondences between homologous and analogous perspectives.

Very much along the lines, Prof. Seitelberger in his paper on “The space-time-structure of human experiential world as a problem of brain research” gave profound insights into the fact that it is man himself who is responsible for the appearance of ‘worldliness’ – in the sense of space-time constancy and consistency – around him, even more obvious within man’s productivity and his self-created cosmos. Regarding the question of govern-

ing principles in nature and correspondences between man and his cosmos this very much seems to be a problem of man's capacity of self-understanding of the importance of our present times and the tasks to be achieved.

Very basic insights in this respect were contained in Prof. Müller's paper "Holton's methodological principles and their relevance for change within scientific conceptual structures". So-called "themes" as peculiar points of view, governing motives and suppositions play an important role in the development of science. Dr. Sechser in "Information and truth; false information and untruth?" applied a viewpoint of theoretical and experiential language (Camap) to information-theoretical questions. Prof. Hölzl in "System theory and classification" stated the enormous problems of product classification, which appear to depend on the multitude of existing institutions with their existing but incompatible classification systems, the multitude of existing products and the difficulty of a standardized categorization of their concepts.

This question-field therefore comes into contact with the perspective of the scientological-linguistical Section 5. Prof. Petöfi pointed out in "Structural knowledge in natural language, structures of knowledge in natural-language communication" to what a great extent any scientific statement and aspect of information is already formed by linguistic peculiarities and how these may influence the information flow. Interestingly enough, above this linguistic level cultural preformation is governing interpretatory processes.

But apparently categorial patterns do this as well, vide Dr. Mönke's paper "Definitions as knowledge-structures of conceptual statements" in which the various types of definitional determinations were identifiable with a small number of basic arrays of interest, such as functional, formal, contextual, etc. J. Panyr in "Automatic thematic text classification and its interpretation in rough information retrieval" gave in his description of the CONDOR system a very interesting example of the extent to which these patterns can be localized within a given context using computerized linguistically analyzing classification, operable with a minimum of lexical preformations.

Finally, in Section 6, expressing the historical-classificatory point of view, covering the aspects of cultural (contextual), categorial (point of view) and text-determined relations between pattern and possible structuring, Dr. I. Dahlberg in "Patterns of knowledge and knowledge of patterns in encompassing classificatory totalities" formulated the basic underlying patterns which may be seen as bringing up the capacity to know in the conceptual sense. She laid down principles and basic rules for universal knowledge-ordering. The new approach which may be seen in this work is the interlinkage of knowledge about the overall pattern of knowing (in conceptualization) with patterns evolving from the organized knowledge, scientific knowledge about the patterns of reality. This interlinkage led to the formulation of an ordering system of the existing fields of learning in a manner very much differing from those already established. The true possibilities of this approach were reflected only very dimly in the discussion. Prof. O. Weinberger, in his paper on "Conceptual structure and

classification", indicated that classification in a great many of possible cases will be merely a tentative approach to reality for reasons of lacking linguistic precision as well as for reasons for generalizing the role of classification. Specific concepts play a different part in various fields of knowledge, classification has to cope with this difficulty. Dr. Maaßen on "Subject cataloguing between theory and practice. Experiences at the Deutsche Bibliothek" finally gave some insight into the problems and recent developments in this area of activities.

The conference closed with reports on the activities of the special interest groups and brief conclusions on the different sections.

In summing up one may note a strong response concerning the widening of the classificatory perspective to enhance various scientific viewpoints. The endeavour of classification is indeed the endeavour of all science: to come to the understanding of reality in an organized, structured manner. But unlike most other sciences the range of the classificatory objective is all-encompassing – here lies the *extensiveness of the problem*. This conference not only demonstrated this total range but also indicated the main keys which point into the direction of the *intensiveness of the solution*: a concern about principle structures as pointed out by Oberschelp in Section 1, by Bresch and Rösch in Section 2 and by Petöfi in Section 5; a focus on order, whether in the sense of the order of the world (Section 1), in the sense of the ordering power of the human intellect (Section 3), or in the sense of scientific reflection about the world (Section 4); an awareness regarding the fact (4), the faculty (3) and facilities (6) of knowing; and finally a quest for the pattern which may be sought in nature (2), man (3) and his capacity to know (6) equally responsible, self-organizing, re-organizing, self-perpetuating.

The quality of this conference will be recognizable once its proceedings are published and carefully studied as a whole. Readers are advised to study all the papers contained in the forthcoming proceedings with their discussions, since this report can only give some highlights regarding their importance. With a deeper understanding of the main questions raised during these days at Salzburg, the field of classification will be able to establish itself in a key position among the other sciences.

With the upcoming conference on "Numerical and non-numerical classification between theory and practice" in Hofgeismar, April 7–10, 1981, the Society strives to extend the level reached to the fields of practical classificatory applications, with special attention being devoted to numerical methods. It is to be hoped that this and future conferences will carry on in the spirit of this Salzburg conference. Wolfgang Dahlberg

Energy Data Classification and Indexing

At the 9th Mid-Year Meeting of the American Society for Information Science, May 14–17, 1980, Pittsburgh, Pa. one session was devoted to the topic "The application of documentary classification and indexing principles to the description, location and tracking of energy data. The session was organized by Irene Travis of the University of Maryland and Mona Smith from the U.S. Dept. of the Interior, on behalf of SIG/CR and SIG/EEI

(Energy and Environment Information) respectively. The following four papers were presented: Charles E. Stuber: Subject indexing and subject categorization for the Energy Data Base. — Roxanne Newton: Integrated indexing of energy data, documents, and contacts and messages in EEMIS (Energy Emergency Management Information System). — Barry J. Brinkman, Robert T. Niehoff: Design and evaluation of an automatic subject switching system for multiple data-base searching. — David Batty: Feasibility and prototype development of a faceted classification of energy data for the NEIS/DRD (National Energy Information System/Data Resources Directory).

11th Annual Meeting of the Classification Society, NAB

The North American Branch of The Classification Society held its 1980 meeting on June 1–3 at Boulder, Colorado. A number of the 12 sessions focussed on methodological issues and innovations in the construction and evaluation of classification systems. Other sessions emphasized the variety of uses and applications of classification techniques by scientists in diverse content areas. Program chairman was Tim Brennan from the Behavioral Research Institute at Boulder. The conference ended with a panel discussion of current issues and directions in classification with the participants J. Douglas Carroll, J. A. Hartigan, H. Friedman and F. James Rohlf. In the following the 50 papers are listed as they appeared in the program.

Innovative Approaches to Clustering

Chair: Peter Bryant

B. Kleiner: Graphical methods in cluster analysis

J. Douglas Carroll: (title to be announced)

Peter Bryant & John Williamson: Maximum likelihood and classification

Maurice Lorr: On the equivalence of clusters in attribute and individual space

Issues in Scaling and Measurement in Classification

Jack Bryant: Linear scaling while preserving distances

Elizabeth Freidheim: Interpretive strategies for multi-dimensions

Allen Nelson: Mixed variable associations for cluster analysis

Stephen Bieber and L. L. Lightner: Classifications through a stationary factoring

Jim Bezdek: Simulation of implicit numerical characteristics using small samples

Classification in Medical Research

Marvin Shapiro: Cluster analysis of some blood enzymes

R. C. Williams: Clustering chronic pain syndromes for description treatment and outcome evaluation"

Kurt Enslein: Models of toxicological endpoints

G. Zerbe: Dynamic classifications of growth or dose response curves over an interval of time

R. Golden: A taxometric model with internal validity tests

Comparisons of Classifications

Glenn Milligan: A monte carlo study of 30 internal criterion measures for cluster analysis

Craig Edelbrock: Comparing hierarchical clustering

algorithms on their ability to estimate underlying population parameters

Mary Downton & Tim Brennan: Comparing classifications: an evaluation of several coefficients of partition agreement

Ed Fowlkes & C. L. Mallows: A new measure of similarity between two hierarchical clusterings & its use in studying hierarchical clustering methods

Applications in Business

Wm. Darden & Roy Howell: Agglomerative hierarchical approach to market segmentation: a 2-stage strategy

Wm. Carper & Wm. Snizek: Evaluating current organizational taxonomies: an application of Sokal & Sneath's Axioms of numerical taxonomy

Harvey Skinner: Subtypes of a mystery product: a practical application of clustering

Gordon Wyner: Problems in survey sampling and cluster analysis

Y. Datta: Excessive variety, frequent model changes & performance of firms in the TV set industry: 1950–60

Classification in Sociological Research

Sam Kingsley & Tyler Thompson (deceased): Invisible colleges: cluster analysis of 3700 scientific journals

Kenneth Bailey: The epistemology of sociological classification

Percy B. Brown: The specification of social structure through canonical factor analysis of network circuits

Janet Rosenberg: The application of cluster analysis to the identification of role & value orientation

Classification Methods in Earth Sciences

Meridee Cecil-Jones: Classification of earthquake-prone areas in southeastern U.S. using a modified pattern recognition technique

Virginia Hetrick & Carol Brezonik: Comparison & pooling of ecological signatures from Clustan

Arthur J. Kendall & David Solomon: Using 'core clusters' in the development of a typology of counties in five western states

Burnis C. Peters: Hisse — a maximum likelihood mixture density estimator which incorporates spatial information in Landsat data

Virginia Hetrick & Dean Alexander: Satellite imagery classification systems

Discriminant Analysis

Galen Bollinger & Gerry Shea: High low discrimination with an application to galaxy classification

Will Gersch: Nearest neighbor rule classification of time series

Jean Weber & David Monarchi: Robustness of multiple group discriminant analysis

Patrick Shannon & V. Lyman Gallup: An alternative measure of discriminatory power

Greg Camilli: Relating the accuracy of classification to covariance adjustments

Miscellaneous Applications in Educational Research & Language

Jill Frary: Applications of cluster analysis in educational research

Gene Allwood: From job survey to test specifications
 David C. Barnett: A cluster analysis of the Strong-Campbell interest inventory
 Pascale Rousseau & David Sankoff: Phonological rule order & variant hierarchy
 Peter Dunn-Rankin & Gerald Knezek: Circular triads: distribution & application.

Classification in Psychiatry

Nancy Andreason & Wm. Grove: Cluster analysis and classification of depression
 Harvey Skinner: A general model of psychopathology
 Craig Edelbrock: Construction of an empirically based taxonomy of children's behavior disorders
 Juan Mezzich: Impact of cluster analysis in psychopathology

Biological and Anthropological Applications

Marc Bekoff & J. B. Mitton: Application of multivariate/numerical taxonomic methods to ethological data
 R. M. Rubison & M. Finnegan: Multivariate classification systems using non-metric traits with application in physical anthropology
 Jonathan Wong & Roger Hansell: Hypergeometric clustering of faunal groups
 Walter Fitch: Approximate four-point metrics

Classification in Management

An announcement and call for papers regarding a workshop on "Classification in Management", Brussels, Oct. 22-24, 1980 was distributed in May.

The workshop will be conducted under the patronage of the Société Française de Classification, France, the Classification Society European Branch, United Kingdom, and the Gesellschaft für Klassifikation e.V., Germany.

The aim is to bring together students and faculty working in the general area of data analysis in management. Four main topics of interest will be discussed.

1. *Fundamentals of Clustering*
 - Classification of a set of data
 - How to select scalings, metrics, criteria and algorithms.
2. *Clustering and Aggregation in Industrial Economics*
 - What is a sector?
 - How to define and operationalize them
3. *Clustering and Prediction in Time Series Analysis*
 - How to detect early shifts and reversals?
 - Stepwise regression
4. *Automatic Diagnosis of Managerial Performances*
 - Internal diagnosis of the firm for managerial decision
 - External diagnosis by tutorial authorities, leaders, shareholders, . . .
 - Failures and bankruptcy prediction
 - Ways of defining a typology of managerial conducts
 - Ways of defining a typology of firms.

Those interested in presenting a paper should contact Professor Jean-Louis Chandon, Institut d'Administration des Entreprises, 29 avenue Robert Schuman, 13617 Aix-en-Provence, France, Tel. (42) 59.09.47 and (42) 24.40.50, and send him a summary of their paper by May 1st, 1980 at the latest. All accepted papers will have

to be submitted in their final form by August 31st, 1980.

The workshop will be held at the European Institute in Brussels, Place Stephanie 20, B-1050 Brussels. There will be a fee of BF 3.500 to cover documentation, lunches and refreshments, to be paid upon arrival, in cash if possible. As usual, participants will be responsible for their own travel and living expenses.

Gesellschaft für Klassifikation e.V., Conference Announcement and Call for Papers

Continuing its series of conferences, the Gesellschaft für Klassifikation eV will hold its 5th annual conference from April 7-10, 1981, in Hofgeismar near Kassel, Fed. Rep. of Germany, and will devote it to the topic

Numerical and Non-Numerical Classification Between Theory and Practice

The Society herewith invites interested persons to attend this conference and submit proposals for papers.

The purpose of the conference being to report on progress and activities in the classification field, especially with regard to the two aspects "Numerical Procedures" and "Practical Applications", its program envisages both general and specialized papers predominantly on topics from the following areas:

1. *Theoretical conceptions for practical application*
 Philosophical aspects of numerical and non-numerical classification.
2. *Numerical methods in classification*
 Mathematical and statistical classification procedures; structuring and analysis of data; comparison and evaluation of classifications; optimal diagnostic keys; computer programs, etc.
3. *Classification from an application-oriented point of view*
 Aspects of classification from the points of view of library science, information science and commodity science (Relevant methods as well as applications of methods and systems).
4. *"Non-numerical" classification methods*
 Experience in the design and application of facet classifications and thesauri of categorial or facet based structure. Computerizability of classification systems and thesauri. Theoretical foundations and practical experiences in the combination of classification systems and thesauri with freely selectable keywords. Syntax of classification systems. Scientometry and informetrics in the classification field.
5. *Practical applications of numerical and non-numerical classification*
 Applications in special fields, as e.g. in biology, medicine, psychology, social sciences, economics, patenting, informatics, linguistics, archaeology, etc.; discussion and delimitation of the objectives and relevance of numerical and non-numerical methods.

Scientists and practitioners wishing to announce a paper on any of the subjects mentioned are requested to so inform the Secretariat (Woogstrasse 36a, D-6000 Frankfurt 50) by 1.10.1980 and to enclose a brief (1-page) abstract. Papers accepted will be published in a proceedings volume.

CONTA Conference, Bielefeld 1981

Detailed planning for the Conference on Conceptual and Terminological Analysis (CONTA) to be held in Bielefeld, Federal Republic of Germany, from 25–27 May, 1981, is progressing. A meeting of representatives of the sponsoring organizations was held in Bonn on June 16, 1980. Participants included, on behalf of COCTA, Fred W. Riggs, chairman, and Henry Teune, executive committee, plus the following representatives of co-sponsors in Germany: Dipl. Soz. Matthias Herfurth, Informationszentrum für Sozialwissenschaften, Bonn; Dr. Ingetraut Dahlberg, Gesellschaft für Klassifikation e.V., Frankfurt; Prof. Dr. Walter Krumholz, Deutsche Gesellschaft für Dokumentation eV and Prof. Dr. Janos S. Petöfi, Zentrum für Interdisziplinäre Forschung und Universität Bielefeld.

Conference Goals

Agreement was reached in Bonn on a redefinition of the purposes of the conference designed to reflect more precisely the interests of the co-sponsors. These now include the following points:

1. To *launch a dialog* between social scientists interested in problems of conceptual and terminological analysis from the viewpoint of producers of knowledge, and information scientists interested in the related problems of terminology, descriptor languages, classification and thesaurus design;

2. To bring into this dialog social and information scientists from *developing countries* so as to enhance understanding of the terminological and conceptual problems faced by scholars of the third world, and as a result to adapt the methods and resources created in the more industrialized countries so as to meet their actual needs more adequately. (A pre-conference seminar on May 24 is planned to help accomplish this objective).

3. To present the findings of the UNESCO-sponsored pilot project of its "INTERCONCEPT" program, notably the elements relating to the *design of glossaries* that can usefully be employed by subject specialists in the social and information sciences who want to prepare glossaries in their own subject fields.

4. To relate these activities and ideas to the *problems of integration among information languages* that have been identified by several groups working under UNESCO sponsorship; and

5. To pave the way for eventual establishment of one or more *terminology banks* designed to meet the special needs of the social and information sciences.

Organization

To accomplish these objectives, the program will consist of plenary sessions during the three mornings May 25–27, followed by working groups in the afternoons. Six theme papers on the following three topics will be presented on Monday and Tuesday, three at each plenary; and these themes will then be the subject of group discussion in the afternoon workshops, at which, however, supplementary papers may also be presented.

- (1) Theory of concept analysis and concept comparison and compatibility.

- (2) Evaluation of descriptor languages and generation of integrated thesauri.

- (3) Establishment of glossaries and term bank implementation procedures.

These topics are approached from a theoretical and practical point of view. On Wednesday morning the rapporteurs of the working groups will present an integrated report on their conclusions, followed by a general debate and finalization of the conference.

To launch the conference, an opening reception and introductory statements by the hosts and the sponsoring organizations will take place Sunday evening, May 24. A keynote statement on the purposes of the conference will also be presented then.

The six theme papers will be presented Monday and Tuesday morning, according to the following plan:

Monday morning

1. Theory of concept analysis
2. Evaluation of Descriptor languages
3. Establishment of glossaries

Tuesday morning

4. Concept comparison and compatibility
5. Construction of integrated thesauri
6. Implementation of a term bank

Among the speakers who have already agreed to participate are: Profs. E. Scheuch, Köln; H. Teune, Philadelphia; F. Riggs, Honolulu; J. Meyriat, Paris; J. S. Petöfi, Bielefeld, D. Soergel, College Park, Md., J. Aitchison, England; H. Arntz, Bad Honnef; W. Krumholz, Berlin; H. Leclercq, Leuven, M. Kronmer-Benz, Wien; M. Herfurth, Bonn.

Pre-Conference Seminar

During Sunday, May 24, a pre-conference seminar is planned to meet the special needs and concerns of participants from third world countries. The morning session will supply background information on a wide variety of activities, projects, and resources that have been launched in the field of conceptual and terminological analysis, as they relate specifically to the situation in third world countries. The afternoon session will then deal, more particularly with the problems faced by third world scholars in identifying concepts and terms, especially in their own languages, that most appropriately meet their specific needs. The relevant methods developed by COCTA will also be presented for discussion.

Invitations and Local Arrangements

On the basis of preliminary correspondence and expressions of interest, invitations are now being issued to speakers, rapporteurs, and other participants. The results should be available for public announcement in the next issue of COCTA News. Meanwhile it is hoped that all COCTA members and other interested persons will seriously consider the possibility of their participation in this conference. A maximum of 100 persons can be accommodated at the Zentrum für Interdisziplinäre Forschung (ZIF) in Bielefeld, where the conference will be held. Attractive and reasonable accommodations for the participants are promised. If you would like to attend, please assure yourself a reservation by writing in advance to Dr. I. Dahlberg, Woogstr. 36a, D-6000 Frankfurt 50. Further details will be supplied upon request.

Compatibility Conference 1981

This will be the theme of a conference planned and co-sponsored by ASIS-SIG/CR (Special Interest Group, Classification Research of the American Society for Information Science) and the Regional North American FID/CR Group, May 12 and 13, 1981, Denver, Colorado. These dates precede the ASIS Mid-Year Meeting in Denver. There will be no formal call-for-papers, speakers will be contacted directly. Papers will cover problems of compatibility, correlation, concordance conversion and/or (re)conciliation of indexing languages and indexing and cataloging practices. Anybody interested in contributing to this conference should contact Prof. Elaine Svenonius, School of Librarianship and Information Management, University of Denver, Denver, Colo. 80208, USA.

The problems of compatibility between and among access vocabularies for better information systems connexion and utilization were pinpointed sometime ago. International efforts were proposed as early as the FID/CR Elsinore Conference in 1964. However, so far, only very few studies have been carried through, and few forms of reconciliation are in evidence. This conference is meant to bring together serious students of these problems. A goal of the meeting will be to suggest practical methods for the possible implementation of compatibility within the conceptual part of information systems.

User Reactions to PRECIS Indexes

The British Library Research and Development Department has awarded Liverpool Polytechnic's Department of Library and Information Studies a grant of £11,400 over one year to study user reactions to PRECIS indexes. This follows a study of indexers' reactions to the PRECIS indexing system, carried out during 1976-77, the results of which were published as BLRDD Report No. 5433 and described in *Journal of Documentation*, 35 (3) September 1979, 164-178.

The new study will investigate the reactions of users of PRECIS indexes such as *The British National Bibliography* and *British Education Index*, mainly by means of interviews. The users to be interviewed include reference librarians and reader services staff in libraries, library school lectures, and, it is hoped, some who are not librarians. The work will be carried out between 1 July 1980 and 30 June 1981 by Helen Peters, Research Fellow, working under the supervision of Ken Bakewell, Principal Lecturer.

Further details may be obtained from K. G. B. Bakewell, Department of Library and Information Studies Liverpool Polytechnic, Tithebarn Street, Liverpool L2 2ER (Tel.: 051-227 1781-3) (International telephone: 615).

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