The Universal Decimal Classification

A guide to its use

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Contents

INTRODUCTION

This work replaced the *Guide to the use of the UDC* published by FID in 1993. It represented a complete rewriting of the original and this revision incorporates all the changes that have been made to the classification up to the end of 2006. All the examples quoted in it are taken from the Master Reference File as it stood on 1st January 2007. This revised version is not a total rewrite of the 2000 edition, but has updated the text and examples to provide a more up to date picture of the current state of the classification. Reference should still be made, where relevant, to the earlier editions, especially that of 1993 where Andrew Buxton outlined the prospects and shortcomings in relation to automation. Other features include a description of the Master Reference File and a select bibliography of editions of the scheme and of writings about it.

I would like to express my thanks for Gerhard Riesthuis who not only works tirelessly on the classification, but has also made himself almost entirely responsible for highlighting those parts of the Guide where a new text was necessary. Without his help my task would have been much harder. Any omissions or errors, of course, remain my responsibility.

Thanks are also due to Geoffrey Robinson and to Aida Slavic who both gave invaluable assistance with the original edition and whose work is still incorporated here.

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I.C. McIlwaine
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Chapter 1

HISTORICAL BACKGROUND TO THE CLASSIFICATION

History

The origins of the UDC lie in the massive enterprise conceived by two Belgian lawyers at the end of the nineteenth century. Paul Otlet and Henri La Fontaine commenced on an ambitious project to create a comprehensive listing of everything that had been written since the invention of printing - a *Répertoire bibliographique universel*.[1] This goal was not far removed from that today of IFLA with its programme for Universal Bibliographic Control. They began to compile this listing on cards and decided that they would organize it on a systematic basis.[2] Consequently, they sought an appropriate bibliographical classification, and were attracted to Dewey's *Decimal classification* which had recently reached its fifth edition. In 1895 this scheme consisted of only a few thousand subdivisions but its notation had great potential for universal usage because of the wider application of arabic numerals than any other notational system.

Otlet and La Fontaine entered into an agreement with Dewey to use his classification with certain clearly defined modifications and expansions. They therefore expanded Dewey's scheme to suit their requirements and added a number of synthetic devices and auxiliary tables which, with the passage of time, turned the then totally enumerative structure of the Decimal classification into the much more flexible and detailed *Universal Decimal Classification*. The first complete edition of this new classification was published between 1905 and 1907 as *Manuel du Répertoire bibliographique universel*. It consisted of some 33,000 subdivisions and had an alphabetical index of c.38,000 entries.

As time went by the classification gained precedence over the

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[1] A full description of this enterprise and a history of the origins of the UDC is to be found in Rayward, W.B. *The universe of information.* (FID 520), Moscow: VINITI, 1975.

[2] A television programme shown on Dutch television in 1998 "Alle kennis van de Wereld" [All the world's knowledge] in the series: Noorderlicht [Northern Light] tx 1998-11-01 portrays this very clearly and demonstrates the vast scale of the enterprise.

bibliographic listing that it was intended to organize, and when the second edition was published in 1927-33 all idea of its prime purpose being as a tool for the *Répertoire bibliographique* had been completely overtaken by the development of the UDC or *Classification décimale universelle* as an all-purpose classification. This second edition was twice the size of its predecessor and it, together with all subsequent additions and corrections, was used as the basis of later editions and translations for many years. The working languages for UDC have historically been French, German and English. It is considered important that more than one language should be used to maintain the scheme's universality and that remains the intention for the future, with English always one of the languages concerned. At the present time English is the only language used for editorial purposes.

The original concept of the UDC as an indexing language appropriate for the arrangement of a vast bibliographical listing is an important one to bear in mind. Unlike the majority of classification schemes familiar to library users, it was not primarily designed as a tool for the ordering of books on shelves. This distinction explains why the scheme sometimes appears complicated and also why, when it is used on library shelves, simple class marks are used, rather than the full range of available notations which can be found in bibliographic listings or other applications. It is also important to remember this in an age of access over the World Wide Web where information is not subject to the traditional filing approach, and where a more flexible approach is essential, with the ability to separate out and express individually the constituent elements that make up the sum total of the piece of information.

The organization set up by Otlet and La Fontaine, originally to take responsibility for the bibliographic listing and subsequently as the publisher of the resultant classification scheme, was named Institut International de Bibliographie, frequently referred to as the Brussels Institute, after the location of its original headquarters. The Institute suffered various vicissitudes during the 1920s and in 1931 the headquarters moved to Deventer in The Netherlands. In 1937 its headquarters changed again to The Hague and the name became Fédération Internationale de Documentation (FID). In 1988 it was changed to International Federation for Information and Documentation (FID). Since the 1930s the publishing rights have been, and still are, assigned by the controlling organization. That

organization, since 1992, has been a consortium of publishers, the Universal Decimal Classification Consortium (UDCC) which took over from FID. The UDC Consortium controls all editions and translations of the classification. Its members have total rights over all editions and formats in their own languages, but all publications in any other language can only be issued under licence from the Consortium.[3]

One of the UDC Consortium's first actions was to create a database that constitutes the authoritative version of the scheme. This is known as the Master Reference File (MRF) and is maintained at the UDCC's headquarters in the Royal Library, The Hague. The software used for its maintenance is UNESCO's Micro-CDS-ISIS. At present the MRF is maintained in English, but the intention is to broaden the scope to other languages in the future, beginning with French and German. The Master Reference File (MRF) has over 61,000 entries and its size increases every year. It is updated annually, subsequent to the publication of the annual list of authorized amendments. These amendments are issued as *Extensions and corrections to the UDC* in November or December. The Consortium's business is run by its Executive Committee, and maintenance of the classification is the responsibility of the Editorial Board which is headed by an Editor in Chief.

Editions of varying fullness exist in a number of languages, but many of these editions are becoming increasingly old. Most editions published since 1992 are the size of the MRF or an abridgement of it. Prior to that date editions were published in so-called full, medium or abridged versions, in a range of languages, though the terms medium and abridged are relative and were never used in any strictly standard manner. As a rough guide, medium editions have been in the range of 40-60,000 entries and abridged editions in the range of 10-15,000. Recently, highly abridged or pocket editions have appeared, e.g. in French and English. The latter has about 4000 entries. Medium or abridged editions are most frequently found, but multi-volume full editions have in the past appeared in several languages such as English, Russian and German, in addition to the

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[3] At the present time (2000) the languages represented on the Consortium are Dutch, English, French, Japanese, Russian and Spanish. The French-language (Belgian) publisher is also preparing a German edition. Czech will be added in 2001.

original French. Publication of these was spread over a number of years, which can lead to great inconsistencies between sections. The Master Reference File is the standard. Any expansions beyond its level of detail are not authorized by the UDCC.

Nature of the classification

The basis of the UDC's claim to universality lies in its coverage of the whole of knowledge within one classificatory system. It is suitable for a wide range of purposes, for the organization and detailed specification of large collections, either of documents or of realia, for the organization of computer files or of information generated in electronic format or for the organization of listings which record the existence of such items (metadata) and for their subject retrieval. The classification's flexibility makes it possible to bring together all references to a particular subject and assists in helping the specialist find information related to his/her own (often narrow) interests by setting them in the wider context of related fields.

The UDC is frequently described as a general classification scheme like Dewey's *Decimal classification*, the *Library of Congress classification* and Bliss's *Bibliographic classification*. The term 'general' may be applied in two ways. It means that a classification incorporates all fields of knowledge and it also means that it may be applied in collections similarly covering the whole of knowledge. The concept of universality implicit in the name of the UDC, includes these same objectives but also suggests that it is appropriate for use anywhere in the world. Its long-standing reliance upon international co-operation in its revision and management strengthens its case to be considered the most truly universal general bibliographic scheme in existence. Its practical application in a large number of countries, especially in those of the non-English speaking world, enhances this.

The very notation on which this claim partially rests, sometimes superficially obscures the aim of a balanced approach which universality also suggests. Because of the original framework, an even apportionment of notation is not evident. Certain subjects, such as Language, History and Literature, rely much more heavily upon the combination of a comparatively limited number of concepts while many of the pure sciences and even more of their applications require far greater enumerated detail within the schedules, as a glance at classes 5 and 6 in the scheme, compared to classes 8 and 9, demonstrates.

The scheme also attempts to provide a more universal and a more international approach than any of its competitors. At the present time, when standardization and interest in Universal Bibliographic Control are important issues, and ways of retrieving information successfully and relevantly on the Web are being sought, the UDC has great potentiality, especially with a view to co-operation in Europe. It was for just such a purpose that it was originally envisaged. Its notation, based on arabic numerals, is of a largely expressive nature so that subordination and co-ordination are frequently self-evident, and it therefore has attractions for machine-searching. In addition, the various elements that in combination make up the classification number of a subject are clearly denoted through a range of notational symbols that are conducive to searching in automated systems.

Principles of classification
Classification is an activity that everyone practises from their earliest years. It is a method of organizing into categories or classes and may be employed for a wide variety of everyday tasks, from the arrangement of goods in a supermarket to sorting paints by shades or cars by engine capacity. It is a convenient way of creating order from chaos, but not everyone organizes in the same way. Therefore, when classification is used as a means of organizing information or objects for general or universal use it has to follow rules and establish recognizable categories in order to provide a standard approach. An obvious application of classification is in the biological sciences where taxonomists organize organisms according to genera and species. These arrangements are the basis of much scientific discussion and debate and fluctuate according to fashion. Despite the views of specialists, a consensus has to be reached for purposes such as the arrangement of field guides or of specimens in a museum. Scientists describe such standardized arrangements as "linear sequences". This description fits many of the classifications that have for centuries been applied to the organization of books in libraries. Bibliographic classifications are used for the ordering of the information contained in documents or in some recorded form. This is not the same thing as the organization of knowledge per se. It is more akin to what in current terminology is described as metadata – data about data, rather than the thing itself.

Classification is based on the principle of sorting concepts by

degrees of likeness. The shared elements are described as characteristics of division. It is therefore essential to ensure that only one characteristic of division is applied at a time, and that all the subdivisions derived from its application have been exhausted before applying another one. If this is not done, cross-classification will occur; for example, if one were to create a classification for Librarianship, one would identify different types of library first, before proceeding to consider the activities involved in Librarianship:

Librarianship

Kinds of library
By funding agency, e.g. National, Public, University, Special
By readership, e.g. Children, Students, General public
By special needs, e.g. Deaf, Blind, Non-native language speakers
By subject, e.g. Law, Music, Art

Materials
e.g. Maps, Music, Photographs, Film

Activities
e.g. Personnel Management, Collection Management, Cataloguing, Classification

Agents (or Tools)
e.g. OPACS, Microfilm readers, Photocopiers

It is essential to approach classification in this analytical manner, if the resultant scheme is to be consistent. The sum total of terms derived from applying a single characteristic of division is described as a facet.[4]

Disciplinary basis
Bibliographic classifications have traditionally been based on an organization of all knowledge under disciplines. The term discipline needs clarification. A **discipline** may be defined as *a fundamental*

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[4] Although the work is now very out of date in many respects, by far the clearest explanation of the fundamental principles underlying library classification is to be found in Mills, J. *A modern outline of library classification*. London: Chapman & Hall, 1963. Chaps 2 and 3.

field of study, such as Philosophy, Sciences, Social sciences, History and Religion. Such disciplines may be further broken down into the subdisciplines, which collectively constitute these disciplines, such as Physics, Chemistry, Economics and Political Science. For the purposes of bibliographical classification it is helpful to identify generally recognized fields of knowledge which are characterized by features such as a distinct object of study, distinctive methods of enquiry, specialized training of practitioners, the existence of learned or professional societies, departments in colleges and universities, specialized information services, etc. Such an approach to the organization of knowledge through the way in which subjects are taught and studied provides a familiar set of landmarks from which to build the basic structure.

A classification is organized on the basis of classes. A **class** may be defined as a *set whose members have something in common*. It may be either simple or compound. A simple class is a straightforward subdivision, for example, within the class Botany, individual plants would be simple classes. A compound class is formed by the intersection of two or more different types of concept (or facet) within the same class, such as plant physiology, plant pathology, plant ecology etc. In a general classification such as UDC the broad classes into which knowledge is divided before any facet analysis takes place and which have no broader containing class, are often referred to as main classes. This is frequently related to the distribution of notation, for example, class 1 - Philosophy, 2 - Religion, 3 - Social sciences, etc. in UDC. This can be useful but is also misleading, since many main classes notated by a single digit contain more than one discipline meriting main class status. (*See* Outline of classes, pp. 53-57). Class 1 is Philosophy and Psychology, Class 6 is Technology, Medicine and Engineering, and so on. Where two classes intersect, for example, in a title such as *Mathematics for engineers*, this is sometimes referred to as a complex class. In UDC such combinations are frequently expressed through the use of the colon. (*See* pp. 66-70).

Underlying principles
The UDC is an *aspect* classification, like all other general schemes in use at the present time. Hence, phenomena are subordinated to the aspect from which they are considered. This means that a phenomenon may occur in more than one class, for example, eggs in ornithology, cooking, animal husbandry, etc. Wherever feasible, an

attempt is made to standardize the notation in these circumstances and the places where this has not been done in the past are gradually being revised.

The UDC is an *hierarchical* classification, which means that each subdivision may be further subdivided into its logical components. This is done by the application, successively, of principles of division. These may be either (i) generic or (ii) whole/part.

(i) A **generic** (or *kind of*) relationship is the one which identifies the link between a class and its members or species. In UDC its most obvious use is in the biological sciences, but it is used throughout the classification. One such use is in Education,

373	Kinds of school providing general education
373.3	Primary school. Elementary level
373.5	Secondary school
373.55	Combined, all-purpose school systems. All-age schools. Comprehensive schools

 (ii)A **whole/part** (or *part of*) relationship may apply, for example, to parts of the body, as in Ear - middle ear; to disciplines, e.g. Biology - Zoology; to geographical location, as in Europe - Italy - Central Italy - Lazio - Rome; and to hierarchical social structures, as in Methodist church organization - Methodist district - Methodist circuit. The resulting classes can, in relation to each other, be in a position of subordination or co-ordination. A number of successively subordinated classes is known as a chain (for example, Literature - English Literature - English Drama - Elizabethan drama - Shakespeare - Hamlet).

In the UDC this would be expressed by notations such as:

57	Biological sciences in general
59	Zoology
596/599	Chordata
597/599	Vertebrata
597.2/.5	Pisces: Fishes. Ichthyology
597.3	Chondrichthyes. Cartilaginous fishes
597.31	Elasmobranchii
597.311	Galeomorphi

597.311.1   Heterodontiformes. Hornsharks

or

(4)	Europe
(450)	Italy
(450.5/.6)	Central Italy
(450.62)	Lazio

A number of co-ordinate classes is called an **array**; that is, a set of mutually exclusive classes derived from the application of one specific characteristic of division (such as English poetry, English drama, English fiction, or the age of persons, or a listing of nation states, such as France, Germany, Spain, Portugal, Italy, Greece, etc.). This term is used interchangeably with 'facet', especially when describing a hierarchical arrangement. It would not, however, be used when describing a characteristic of division. One could therefore speak of the 'language facet' which consists of a series of arrays based on the listing of various groupings of languages, such as Romance languages, Celtic languages, Slavic languages.

In the UDC this would be expressed by notations such as:

821.111-1	English Poetry. Poems. Verse
821.111-2	English Drama. Plays
821.111-3	English Fiction. Prose narrative
821.111-4	English Essays
821.111-5	English Oratory. Speeches
821.111-6	English Letters. Correspondence
821.111-7	English Prose satire. Humour, epigram, parody etc.

or

(410)	United Kingdom
(430)	Germany
(450)	Italy
(460)	Spain
(470)	Russia
(480)	Finland

UDC is a *synthetic* classification, which means that the enumerated classes are the building blocks whereby compound and complex classes may be denoted by the various synthetic notational devices

outlined on pp. 63-70. This enables the specification of concepts in combination, without relying on the originators of the classification to predict the need for such a combination.

Practical implementation of the theory
The UDC table (schedule) comprises class entries systematically arranged. A UDC class entry may have several components but there are two which must always be present, the class description and the class number, that is a term and its notational symbol.

Class description
The class description or term is the essence of the class entry. It defines the concept within its hierarchical context by exactly describing it in natural language. The first, and often the only, part of the description is the primary term which may be a word or a phrase. This may be followed by additional terms (synonyms) expressing the concept, and frequently also by antonyms where opposites are treated together. These additional terms are particularly important when a verbal index to the classified sequence is being constructed since they suggest synonyms and alternative terms that may be sought by users. Full use should be made of them in information retrieval. They are also of value for individuals concerned with devising their own specialist classifications or thesauri, since they often provide an excellent source for terminology. (*See also* the sections on Indexing, esp. pp. 17-19, 202-227)

Terms from technical and other specialist vocabularies have been included in the UDC, but every effort has been exerted to make their meaning clear. Particular problems occur when the same term is used with different meanings. This can happen either through variant usage by different schools of thought within one discipline or in different countries using the same language and through the use of the same term with entirely different meanings in different contexts, for instance "analysis" in mathematics or chemistry or "public school" on either side of the Atlantic. This problem is in some measure alleviated by the use of a classification rather than verbal indexing, as the systematic display clarifies the context in which the term occurs in a way that cannot be so clearly demonstrated by words alone.

Within the classification, each concept is defined in its own terms, rather than through the listing of subordinate classes. Any concept

should occur at one place only within a particular hierarchy. In most editions of the UDC there are some places where concepts are grouped together, to indicate a comprehensive collection of terms, some of which are then individually specified at lower levels. This suggests that the placing for a specific term is earlier than it actually occurs, so class 6 may be headed Applied sciences. Medicine. Technology (only 61/619 covers Medicine); similarly:

54.05	Production. Preparation. Isolation. Purification etc.
54.051	General principles of procedure for production, sampling etc.
54.052	Mode of procedure, choice of method etc.
54.053	Design of method or procedure. Technique used
54.055	Preparation by dry means. Including: Grinding. Fusing
54.056	Preparation by wet means. Including: Dissolving. Extracting
54.057	Synthesis
54.058	Purification

where 54.051/.053 denotes procedures and techniques in general, 54.055/.056 preparation and 54.057/.058 other operations. This practice should be noted to ensure specific classification.

Specification in the UDC may be by:

- direct subdivision of the class
- addition of auxiliary numbers
- linking of the notation of a given subject to that of another by means of connecting symbols.

The application of these various means of specification is explained in Chapters 3 and 6.

Class number
The class number (UDC number) is the notational part of the class/concept entry. The notation is the code used to represent the class and it determines the place of that class within the classification scheme. It can take the form of either a single arabic numeral (at the highest level), or a sequence of arabic numerals, or a sequence combining arabic numerals and other authorized UDC symbols. UDC notation is based on a series of symbols and arabic numerals

arranged according to the decimal system. The numerical notation is extended like decimal fractions and the length generally reflects the hierarchical level. Every number is treated as if it were a decimal fraction and this is reflected in the filing order. The following numbers would be in this order if they were integers (or integers plus decimals):1, 02, 3, 6, 22, 37, 66, 82, 94, 210, 543, 655, 681.81, 728.1, 811, 929. But in the UDC they file as if they were all decimal fractions:

Class number	as if
02	0.02
1	0.1
210	0.210
22	0.22
3	0.3
37	0.37
543	0.543
6	0.6
655	0.655
66	0.66
681.81	0.68181
728.1	0.7281
811	0.811
82	0.82
929	0.929
94	0.94

Concepts of an equivalent rank within a particular class or section normally have numbers of equal length. There are, however, many places where lower levels have been compressed into one notational array, preserving the decimal sequence but keeping the numbers shorter, for example, at 796.3 - Ball games, or in the enumeration of different kinds of Civil engineering at the notations following 624:

624	Civil engineering
625.1/.5	Railway engineering
625.7/.8	Highway engineering