Brian Vickery and the Classification Research Group: the legacy of faceted classification

Vanda Broughton

Department of Information Studies, University College London

Abstract

This paper considers the impact of faceted classification as it developed in the United Kingdom; it examines the origins of the Classification Research Group and Brian Vickery's unique contribution to it, and the way in which faceted classification today has fulfilled the objectives of the CRG's 1955 manifesto to make 'faceted classification the basis of all information retrieval'.

Introduction

> 'Despite the fact that our profession constantly urges others to "consult the literature", I do not think we are distinguished nowadays by knowledge of our heritage.' (Vickery, 1998, p.283)

The United Kingdom Classification Research Group had its origins in the scientific episteme of the post-war period, specifically the 1948 Royal Society Conference on scientific information, which was convened as a result of concerns about the great increase in scientific information, and problems of its management and dissemination. Following the Conference a working party on subject classification was set up, but its secretary, the physicist J. D. Bernal, concluded that the problem of classification was 'far more complex than was imagined at the outset'(CRG, 1955, p.262). Fortunately, there was an appreciation that librarians might be well positioned to address the problem, and A. J. Wells of the British National Bibliography and Vickery, who had attended the Conference while he was librarian at Imperial Chemical Industries, were invited to assemble a working party to look into the organization of scientific information. This working party, which first met in 1952, and which in its early years included such significant figures as Derek Austin, Eric Coates, Jason Farradane, Robert Fairthorne, Douglas Foskett, Barbara Kyle, Derek Langridge, Jack Mills, Bernard Palmer, and Jack Wells, as well as Vickery himself, was the Classification Research Group.

The publications of the CRG

There are various studies of the work and significance of the CRG which adopt conceptual, sociological, historical, and bibliometric viewpoints (Afolabia, 1985; Foskett, 1970, 1971; Frohmann, 1983; Hopkins, 1973; Justice, 2004; McIlwaine & Broughton, 2000; Miksa, 2002; Wilson, 1972), and some unpublished studies which have commented on the small group output of the CRG (Furner, 2000, 2001). Certainly, a number of the original CRG members published virtually nothing, and some significant members are not well represented in the literature. This has led to a debate on how far the CRG was truly collaborative, or whether their joint output is simply the collation of work by individuals. This is a reasonable question, given that numerous projects were conducted by

individuals outside of the meetings of the CRG, but the essential product of the CRG was the collective analysis of those projects and the evolution of a consensus on a general methodology and conceptual approach to classification.

The corporate publications of the CRG are few, and their deliberations are principally represented in their occasional *Bulletins* (published initially independently, but from the fourth issue as papers in the *Journal of Documentation*), the statements of intent published in the *Library Association Record* in 1953 and submitted to the Library Association Research Committee in 1955, and the proceedings of what is commonly known as the Dorking Conference (*Proceedings of the International Study Conference on Classification for Information Retrieval*, 1957) together with the 1963 conference on the proposed general classification scheme (*Some Problems of a General Classification Scheme*, 1963). In addition, results of CRG discussions can be seen in contributions of members to the *International Conference on Scientific Information* held in Washington in 1958, ten years after the Royal Society conference. Papers were presented by Vickery, Foskett, Fairthorne, Farradane, and Palmer, although the last two are concerned with professional training, and only Foskett addresses specifically the nature of faceted classifications in a paper on the methodology of their construction.

The last summaries of the CRG's collaborative activity date from 1968 (CRG, 1968; Foskett, 1971), and it is to be regretted that no formal record of the later proceedings of the CRG is easily accessible. A substantial archive kept until 1980 now seems to have disappeared, although a smaller collection of papers from the 1990s is retained in the Department of Information Studies at University College London. Evidence of work in that period is therefore accessible principally through the publications of individual members.

Three issues of the *CRG Bulletin* (1961, 1964, and 1968 respectively) include bibliographies of members' publications. In this period only Coates, Fairthorne, Farradane, Foskett, Kyle, Langridge, Mills and Vickery published more than 10 papers, although some significant scholars were later to be more productive. Vickery was the most prolific author, but it should be borne in mind that he is sometimes the voice of the Group, notably in *Faceted Classification* (Vickery, 1960), where he states that '[a] first draft of this guide was dissected in detail by the CRG and completely rewritten as a result…'(Vickery, 1960). Vickery's output remained substantial throughout his life; a bibliography of his work in a special edition of *Journal of Documentation* to mark his seventieth birthday numbers over 150 items (East & Adams, 1988), and he was to produce more in the following twenty years.1

The early history of the CRG

The remit of the CRG in its early days was classification for retrieval, rather than for physical organization, and the phrase 'classification for retrieval' appears regularly in the early literature, both in the titles and bodies of papers. Central to the whole enterprise is the role of faceted classification, and early in its lifetime the CRG published a manifesto with the stated objective 'to make faceted classification the basis of all information retrieval' (CRG, 1955), and which lays down the general principles of the theory and methodology which would achieve that end. These are based on the ideas of S. R. Ranganathan, which were broadly embraced by the membership; nevertheless, out of their discussions a distinctive UK version of facet analysis evolved.

The progress of the CRG's work can be seen in resumés in the *Bulletins*, and in Foskett's article in the *Encyclopedia of library and Information science* (Foskett, 1971). Early meetings are devoted to first principles and the foundations of the theory, which is tested and modified in a series of special

1. An updated bibliogaphy appears elsewhere in this volume. [Ed.]

schemes on subjects as diverse as music and diamond technology. The Group addresses the categorization of concepts, the nature of relationships between concepts, and problems related to notation. Later they consider whether facet analysis can be applied to knowledge as a whole without a preliminary disciplinary breakdown, and conclude that, while general categories can be used to accommodate all concepts, there is no clear organizing principle for the sequences. Integrative level theory is discussed as a basis for ordering entities, and their associated disciplines, but energy facets are less easy to structure. The major occupation of the Group in this period is a proposed new general classification scheme, funded by a grant from NATO, of which Foskett states:

> 'Such a scheme will provide at least a matrix for traditional use … but it will be more. It will be a generalized information retrieval language, with vocabulary and grammar … and for manual and mechanical retrieval systems. It will be the starting point for specialised classification schemes, descriptor lists and thesauri, and will thus provide a genuine solution to the problem of compatibility between systems on the international plane.' (Foskett, 1971, p.145)

This is in marked contrast with other perceptions of the general scheme (Minute 562 of *CRG Bulletin 8*, quoted below), and it gives a vivid impression of the perceived power and potential of facet analysis as a general theory of knowledge organization and retrieval.

A feature of Vickery's paper at the 1958 Conference (which it shares with a number of others there) is its concern with the adequate representation of complexity. Vickery uses the term 'lattice', whereas 'matrix' is favoured by others, but there is an evident awareness of the multi-dimensionality of information spaces that suggests at least some reasons why current interpretations of facet theory offer solutions to web retrieval. It is noteworthy that the CRG addressed the problems of retrieval very broadly, considering the interdependence of the conceptual, verbal and notational aspects of retrieval languages, and the commonalities of manual and machine systems. Facet analysis was in many respects a 'theory of everything', something which later appeared to become obscured, but which today has re-emerged.

As the 1960s progressed, Vickery's interests concentrated more on information retrieval and less on classification, and during that period he stopped attending meetings of the CRG. An examination of items in the 1988 bibliography (East & Adams, 1988) reveals the term 'classification' in the titles of 26 of his 94 publications before 1970, slightly over 30%; from 1970 onwards 'classification' appears only twice in 26 items. *CRG Bulletin no. 8* (1964) has no mention of any contribution from Vickery, and it seems likely that around this time he ceased to be an active member. There is some speculation about the reasons for this, but from the mid-1960s onward there is an apparent difference and divergence between classification and information retrieval, with a separation of the literature and of the significant players in each field (Miksa 2002). In respect of the proposed new general classification, Minute 562 from *Bulletin no. 8* states categorically that 'it was agreed that the classification envisaged here was intended for the arrangement of books on shelves, pamphlets in files, and for the arrangement of cards representing books, pamphlets and articles, in classified card indexes'. This concentration on the physical collection is in marked contrast to Foskett's view in the *Encyclopedia*, and must have been a long way from Vickery's vision of the relevance of classification to all types of information retrieval tools.

Later years of the CRG

Plans for the new general classification scheme were to an extent undermined by Austin's appointment to a post at the British Library where his research was re-engineered as the PRECIS

indexing system. From the early 1970s onward there was a shift back towards discussion of individual research, rather than collaborative effort, until the prospect of a new general classification was once again delivered up in the shape of the Bliss Bibliographic Classification revision project (BC2).

Discussion of BC2 dominated the CRG until its demise in the first decade of the twenty-first century, when one of the two remaining original members, Eric Coates became too unwell to attend meetings; Jack Mills remained as Chair, a role he had performed since the 1960s. If the concentration on BC2 has impeded progress in other directions, it has at least realised the practical implementation of the CRG theory. The 98 page introduction to the scheme (Mills & Broughton, 1977) is the only comprehensive statement of facet theory as it was developed by the CRG, although it must be conceded that it deals only with building the conceptual structure, and says very little about terminology, vocabulary control, or machine retrieval. Although BC2 has the potential to be Foskett's 'generalized information retrieval language', it falls some way short of that, a situation which in 2011 we are beginning to address.

Faceted classification today

In attempting to evaluate the impact of the CRG in practical terms, and the degree to which the aim of their original manifesto 'to make faceted classification the basis of all information retrieval' has been achieved, it is clear that in the twenty-first century there is a new appreciation of the value of facet analysis for constructing a whole spectrum of information retrieval tools (Broughton, 2006). (Examples here are very numerous, so references in the text are necessarily selective.)

The influence of facet analysis on the general schemes of classification is evident. One can see in all of them a more rigorous approach to the structure and organization of classes than in the past. Elements of the faceted scheme, such as schedule inversion and organization of concepts into facets and arrays are now much more common, as is the consistent application of citation order, and an increasing level of synthesis. That this is an editorial policy for the Dewey Decimal Classification is made explicit in the Introduction to the twenty-first edition of DDC (Mitchell, 1996). Since the early 1990s it has been the objective of the Universal Decimal Classification, already highly analytico-synthetic, to reinforce its flexibility and logic through the use of facet analytical techniques, and to convert it over time into a full- faceted classification (McIlwaine & Williamson, 1994). A key element has been the use of BC2 terminologies as a basis for revised schedules (McIlwaine & Williamson, 1995). At the Library of Congress too, although the Classification remains relatively untouched by facet theory, the Subject Headings clearly show its influence, mainly through the FAST (Faceted Application of Subject Terminology) project, a programme of simplification and rationalisation of the headings to make them suitable for post-coordinate use (FAST, n.d).

From the beginning the relevance of a faceted structure for thesauri was recognised, and *Thesaurofacet* was one of the first faceted retrieval languages (Aitchison, Gomershall & Ireland, 1969). Jean Aitchison later developed several faceted thesauri, and wrote a seminal paper on the extraction of a thesaurus from a faceted classification (Aitchison, 1986). The methodology of creating a thesaurus from a faceted structure is now well established (Shearer, 2004, Spiteri, 1997), and has made its way into the current standards for structured vocabularies, explicitly stated in the British Standard (BS8723, 2005, p.31), if less enthusiastically recommended by the American equivalent (ANSI/NISO Z39.19-2005) .

At the turn of the millennium several papers drew attention to the usefulness of facet theory as a basis for digital information management, and its potential for improving retrieval from the world

wide web (Broughton, 2001; Ellis & Vasconcelos, 1999, 2000; Vickery, 2008). The clarity and logic of structure in faceted systems make them particularly appropriate to graphical interfaces so it is hardly surprising that a faceted approach has been adopted in organizing digital collections and in search interfaces for the same: 'faceted search' and 'faceted browsing' are regularly encountered in the academic environment. More unexpected is the take-up by the commercial world, generating a parallel strand of comment and research, as well as serious academic studies of the phenomenon (Adkisson, 2005; Denton, 2009; La Barre, 2006). Facet analysis in e-commerce is rather narrower in its scope than the 'classical' variety, but is nonetheless of interest for its demonstration of fundamental principles.

A complex digital application of facet techniques is in the modelling of newer types of tools such as taxonomies and ontologies, with an increasing number of projects (Damiani, Fugini & Belletini, 1999; Prieto-Diaz, 2002), including the development of a faceted mark-up language (Van Dijk, 2002). Most exciting is the occurrence of facet theory in semantic web applications (Miles & Bechhofer, 2009), including attempts to represent the model of a faceted classification through the use of mathematical logic (Rodriguez-Castro, Glaser & Carr, 2010), or to demonstrate the way in which faceted classification syntax can be used to enable automatic classification and terminology building (Stoica, Hearst & Richardson, 2007).

An obvious measure of the current interest in facet analysis is the representation of it in the literature. The results of searches for the terms 'facet', 'faceted', 'faceted classification', and 'facet analysis' over the *Library and information science abstracts* are shown in Figure 1.

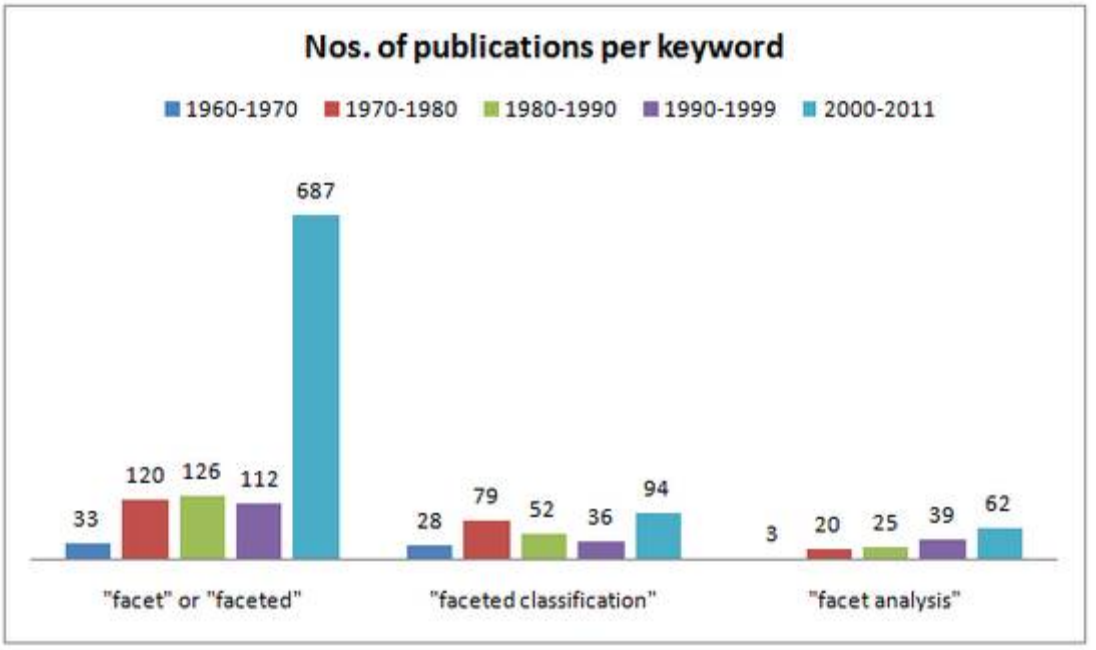

Figure 1: Representation of facets in the LIS literature

These results are not exact: most of LISA is searchable only in decade blocks, so there is some overlap between, for example, 1970-1980, and 1980-1990. The choice of LISA as a database excludes some material that might be revealed in a computer science database, but it does limit the number of false drops where facet is used in some alternative discipline (such as mineralogy), or in a more general sense. ('Facet Publishing' was specifically eliminated from the search.) Nevertheless the outcome is sufficiently striking, and confirms the general trends observed here. After the

formation of the CRG there is an increase in the literature on facets through the 1970s and 1980s, perhaps reflecting a golden age of systems for managed environments, and the production of such tools as Thesaurofacet, PRECIS, and BC2. In the 1990s this falls away, again possibly mirroring the rise of automated search and a decline of interest in intellectually-built systems. But in the age of the world wide web, interest in facets rises, in a modest way for the formal approach of faceted classification and facet analysis, and quite spectacularly when a more general understanding of facets is sought.

At a conceptual level, recent work on BC2 has shown that a faceted structure can and does constitute a platform on which different varieties of information retrieval tools can be constructed (Broughton, 2011). Recent modification of its management software has shown that structured data used for automatic production of the systematic display and associated alphabetical index can also generate a workable thesaurus, and is readily converted to other exchange formats such as XML to provide a web enabled version.

Conclusion

The real genius of the CRG lies in its shaping of facet analysis as a generalised methodology for information retrieval, and the foundations for this were laid very early on in its history. Key features of the approach can be identified as follows:

- the notion of categorization of concepts as the basis for intellectual organization of knowledge;
- the clear, unambiguous exposure of relationships between concepts, both hierarchical, or within facets, and syntactic, through the interaction of facets;
- a formal system syntax, with synthesis of concepts to represent compound and complex subjects;
- as a consequence, the generation of a logical, predictable, and theoretically machine-comprehensible, knowledge structure.

These essentially classificatory elements feed into and enhance the broader applications of information retrieval in the physical environment, in managed automated systems, and today in the unmanaged world of the internet.

In a personal evaluation of Vickery's contribution to the CRG, Coates identifies three major factors: Vickery's role as a leader - 'a driving force in uniting and stimulating the study and understanding of classification' (Coates, 1988, p. 217) - and two key intellectual advances: the development of Ranganathan's ideas into a practical tool for scientific libraries, and the clarification of the role of classification within the wider activity of information retrieval (Coates, 1988). Vickery did at one point doubt the validity of that wider purpose, and the original objective of the CRG, to make faceted classification the basis of *all* information retrieval. In the preface to the third edition of *Classification and indexing in science* he says that 'I must now judge that claim to have been too bold' (Vickery, 1975, p. 1). History has proved his doubt unfounded.

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Corresponding author:

Vanda D Broughton can be contacted at v.broughton@ucl.ac.uk