

## BOOK REVIEWS

Chen, Ching-chih, *Application of Operations Research Models to Libraries: A Case Study of the Use of Monographs in the Francis A. Countway Library of Medicine, Harvard University*. Cambridge, Mass.: MIT Press, 1976, 212p.

In 1968, Philip McNorse published a book on *Library Effectiveness: A Systems Approach*. Essentially it presented a set of potential mathematical models for describing the operations of a library. Professor Chen has, in this book, expanded upon those models and tested them with data drawn from the operations of the Countway Library of Medicine.

To be specific, Morse presented two models with which Professor Chen is concerned. One of them uses the geometric distribution to describe circulation of books in a given year; the second uses a simple Markov process to relate the circulation of books in one year to that in the next year. The relevant equations are

$$(1) P_1(m) = (1 - \gamma) \gamma^m$$

$$(2) T_{mn} = \frac{(\alpha + \beta m)^n}{n!} e^{-(\alpha + \beta m)}$$

Where  $P_1(m)$  is the fraction of books that circulate  $m$  times in a year;  $T_{mn}$  is the probability that the circulation of a book will be  $n$ , given that it was  $m$  in the prior year.

These two models were tested using circulation data as recorded in all books that circulated during four one-month periods—about 12,000 circulation records. Specific classes of books were then analyzed in detail (those classified under the Boston Medical Library schedule constituted one class and those classified under Library of Congress classes QU, QZ, WA, WG,

WM, WO, and WS were seven others). The number of books that circulated  $j$  times in the year was estimated as follows: The books circulated during the sample period were grouped by frequency of circulation during the prior year; the total of those that circulated  $j$  times was divided by  $[1-(1-e)^j]$ , where  $e$  was the proportion of the year's total circulation represented by the sample period. The result was a very close confirmation of the geometric distribution for each of the eight specific classes of books.

The circulation records were then used to record  $N_{mn}$ —the number of books that circulated  $m$  times in one year and  $n$  times the following year. The simple Markov model was then tested against those data for each of the eight specific classes of books. The fit appears to be remarkably close. In fact, if we apply a Pearson chi-square test for goodness-of-fit to Table 6.1 from page 69, grouping in a somewhat arbitrary manner:

		Table 6-1		Theoretical	
m	n	0-2	3+	0-2	3+1
0-2		211	105	215	101
3+		103	141	100	144

we get a chi-square of .38, with two degrees of freedom. That is a remarkably close fit (greater than 75% probability that a larger value would have occurred, if chance were controlling. One must be impressed with the depth of detail, the carefulness of the methodology, and the degree of the confirmation of the hypotheses. The author then turns to interpretation and use of the results. There is discussion of Bradford's distribution, of book selection policies, of duplication policies, of weeding policies, of operational decisions. These are all interesting and potentially valuable applications of the models to decision making problems. However, the discussion is much more speculative.

There is one issue of specific concern in application of the models. It is the identification of "use" with "circulation." The distinction between "in-house use" and "circulation use" is an important one; decisions about the nature of users, book

selection policies or weeding policies, etc. that are based upon circulation data alone are therefore suspect. The problem is two-fold: (1) the models have not been tested for their validity in describing total use (although one might have a high degree of expectation that they will be valid) and (2) the circulation data does not describe the total use (and probably not even as much as 25% of the use) of a collection.

In summary, this book is a most valuable contribution to the growing body of literature that is demonstrating that library operations can be quantified. The author, Professor Chen, is to be congratulated.

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and Information Science, University  
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Kan, Lai-bing, comp. *Library Services in Hong Kong: A New Directory*. Hong Kong: Hong Kong Library Association, 1975. 228 p.

Nowadays, in a situation of soaring costs and shrinking budgets, most libraries find it difficult or even impossible to enjoy a comprehensive collection development. As resource sharing is imperative, library directories that provide information about the availability and accessibility of materials have become useful tools in the library community. Dr. Kan's directory is therefore a timely publication. As stated in the introduction, the book aims at serving local librarians, general readers, scholars and researchers. Also in the introduction, the compiler touches upon the historical development of Hong Kong libraries. The directory itself is an alphabetical listing of libraries with a classified list at the end. Each entry includes almost uniformly such information as name of library, location, telephone number, contact person, type and size of library, accessibility, financial support, size of collection, classification system used, loans per

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year, and publications. As all libraries are listed in one alphabetical sequence, unevenness is inevitable. For example, description for most school libraries consists of only a few lines, while for research libraries it occupies two to three pages. To enhance effective use of the directory, the compiler might well consider for the next edition listing the libraries according to types with a name index at the end.

Based on the data in the directory, school libraries in Hong Kong are supposed to support curriculum only. Loans are restricted and are not interchangeable among schools. There has been no standardization of collection development and bibliographic control, nor have there been any cooperative activities. The inadequacy of library service in some schools points to the fact that the role of school librarians is not yet recognized and that many teachers are text-book oriented. According to *Hong Kong 1975* published by the H. K. Government Press, there were 388 secondary schools in Hong Kong in 1974, but the school libraries, including both secondary and elementary levels, listed in the directory totalled only 119. This discrepancy raises a question about the comprehensiveness of the list on school libraries. Perhaps it is not Dr. Kan's intention to be exhaustive in this respect. The *White Paper on Education* published in 1974 stated that the expansion of secondary education was the government's chief objective for the next decade. This development will surely complicate the updating of the directory. Due to the complexities, it seems appropriate that this type of libraries be listed separately. The present arrangement, dominated by school libraries, not only frustrates comparison of important libraries but also causes difficulties in locating the names which are unfamiliar to the users, who are already confused by the interesting adoption of 'college' for a secondary school.

Academic and public libraries are presumably to play an important role in support of research. Users might be more interested in knowing the strengths of collections, accessibility and cooperative activities. Local bibliographies and descriptions of rare or special collections would be very helpful. All these,

however, are only skimpily dealt with in the directory. The statistics of holdings, based on questionnaires, seem to be reliable, but guidance is needed in places where the compiler uses 'audio-visual materials' to include microfilms, microfiches, microcards (p. 37), and 'microforms' to include phono-records and tapes (p. 75).

The value of the book, however, far outweighs its shortcomings. Besides being an indispensable tool for interlibrary loan librarians in Hong Kong and perhaps the Far East, it provides students of comparative librarianship a trove of information unavailable elsewhere. Among the welcome qualities is the inclusion of the pictures of leading libraries, which feature the strong influence of the West on architectural design. The number of libraries covered, though less in depth in some places, reflects Dr. Kan's years of effort. This directory is a commendable contribution and deserves consideration for inclusion in the reference collection.

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