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A Systems Approach to Book Search in a Library

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Introduction

Searching for misplaced books in a library can be a daunting task. A book is handled by many people including staff, children, patrons, and volunteers who shelve material. Searching for physical books is a human process prone to human error. This article is the joint work of an experienced librarian and a systems engineer. By taking a systems approach to the book search problem one can improve library service. In this article we will review some heuristics or rules of thumb that have been found to be effective in finding books a library might otherwise take a long time to find.

Traditional System of Book Search

Before jumping into the new approach or algorithm to speed up book discovery, it is useful to review the traditional model for book search that librarians use. The traditional system works for most situations. This system begins when a librarian looks up a book using the library catalog. If the material is listed as not checked out, the librarian goes to the shelf. If the book is found in the appropriate place, the search ends. If, however, the book is not where it should be, the librarian looks on the shelf surrounding the area where the book should be. The reasoning behind this is that if someone misshelves the book, usually a patron, the book is probably on a nearby shelf. Thus one scans the books on the shelf, performing an exhaustive search for the name, call number, author, through nearby shelves, usually above and below the shelf where the book should be. If this fails, the librarian may scan the entire column of shelves and the column to the right or left of the shelf. Then the librarian usually checks the area in the circulation department where there are recently-returned books and carts of books waiting to be shelved. If this does not work, a "trace" is placed on the book so that if it appears or is checked in, it will be flagged to be reserved for the patron.

Enhancements to Book Search Process

To improve the current system of search, we offer a few more places to search, which usually work when the traditional methods fail. These techniques are based on experience with impatient patrons as well as the fact that wandering in the library at leisure allows one to develop a detailed working knowledge of patron and library volunteer/staff behavior as one notes interesting anomalies or patterns.

Heuristic 1

Sometimes the book in question is dumped later in the same aisle or adjoining aisle to where the book should be. This requires scanning the whole row of shelves. What can help speed this up is to remember that often the book is placed in a rush and looks awry and out-of-place. As such it will stand point, especially if you are the eager patron looking for the title or author. Looking for out-of-place call numbers is another way to detect anomaly.

Heuristic 2

The next place to check is the transposed version of the call number. For example, if a book is supposed to be in call number 658, check 568, 865, 856, etc.

Heuristic 3

The third technique is looking for books with similar titles. For example, *American Nature Writing 2003* (call number: S AMERI) could be placed near *American Nature Writing* (call number: 810.8). This may be a mis-shelving, and sometimes the book may even be more correctly classified in the incorrect place.

There are things patrons learn by wandering. For example, computer or complexity science books may be found in math (510), finance, or psychology. Classification is a fuzzy area for interdisciplinary topics and often the same type of book or author gets classified differently. It is a pleasant surprise to find a book on the topic you are interested in, in a section where you never would have looked, or which on the surface seems unrelated. A simple example is *The Deliberative Practitioner*, a book about organization theory, which is often classified under architecture or city planning, because the context of the book is in that domain context. The book can really be looked on as more of an organizational behavior treatment, like *The Reflective Practitioner*, which is classified in psychology, and also not in organizational development. Other examples are complexity or statistics/operations research books classified near the computer section while similar books are in the business or investment section. (Winston's *Operation's Research* is classified in business, while the classic Hillier and Lieberman *Operations Research* text is near the computer section. Other operations research books may be found classified under economics. Taleb's *The Black Swan* is near this section as well, while the same author's other similar book *Foiled by Randomness* is in the finance section. Strogatz's *Sync* is near the computer section but his book on nonlinear math is in the physical science section.

Lakoff's *Women, Fire, and Dangerous Things* attests to the difficulties inherent in classification. We can hope that sophisticated online searching tools will make this less of a problem, and that if errors are randomly distributed, patrons will have a chance of finding a book that will lead them to other areas and enrich their scholarship. Classifying similar topics in different areas has a nice side effect: different patrons can learn about areas they might never have found had the classification system been "perfect," given their limited knowledge or a too-specific search based on a particular term.

Heuristic 4

One last place to check is tables scattered in the library where patrons may gather their books while perusing and then leave those books behind. One need usually only search tables near where the book should be.

Conclusion

Most misplaced books follow some pattern based on human behavior. Understanding Patron behavior leads to novel search techniques that can help a book to be found earlier. This is in contrast to

looking for missing books on the floor or in areas where they may have fallen or been stolen. By systematically understanding patron and library staff/volunteer human behavior one can improve library service.

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