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Judith M. Nixon

Purdue University, jnixon@purdue.edu

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Using a Database Management Program As a Decision Support System for Cancellation Decisions of Business Periodicals and Serials

Abstract:

Periodicals and serials have been inflating at double-digit rates for years. As no library can shoulder inflation rates over many years, these escalating serial prices lead inevitably to the question, which periodicals to cancel and which to keep. This is not an easy question to answer; evaluating the collection is a complicated and often subjective process. At Purdue we have had to face serial cancellations less frequently than some other research libraries, but in 1996/97 we faced the second one in less than five years. This prompted a search for a more objective method of deselection. This article is about the Decision Support System that was developed for a serial cancellation project in 1997 by the Management and Economics Library at Purdue University.

The Impetus to Develop the Decision Support System:

The journal is one of the most important publications in a business research library, which is evidenced by the large percentage of our collection budget that is spent on journal subscriptions; our serial budget is eight times as large as the monograph budget. This is not surprising given the currency of the research in a business library. So the periodical and serial collection merits careful review and study.

If the percentage of the budget spent on serials is not reason enough to turn energy and time to evaluating the serial collection, then the inflation rate of serials is.

Periodical prices are inflating at a double-digit rate, which far outstrips the consumer price index. Since most library budgets are linked at least partially to the standard inflation rate, every year it is more difficult to pay the serial bill. Librarians are aware of this; periodical price surveys are published every year in *American Libraries*. It is so much a part of our profession that at times we are somewhat numb to the facts and figures. But the truth is that between 1984 and 1998 while the Consumer Price Index (CPI) went from 100 to 156.9 and the Higher Education Price Index (HEPI) went from 104.8 to 184.9, the U.S. Periodical Price Index went from 100 to 365.2.(Albee & Dingley, 1999) Business and economics journals inflated close to the average, a lower rate than chemistry and physics journals, but they still outstripped the CPI or the HEPI. In 1984 the average cost of a business and economics journal was \$38.87. Fifteen years later, in 1999, the price had jumped to \$131.82, with a price index of 339.1. Price increases averaged around 8% per year. Unfortunately this trend is not stopping.

Table 1:

Literature Review:

The impact of this over the past twenty years is indicated by the many articles that have been written on serial prices and cancellation projects. Of late the articles are concentrating on the future of the journal and how Web access will affect the method scholars use to communicate.(Black, 1999; Mobley, 1998; Rosenzweig, 1999) Certainly electronic access to journal articles will help provide desktop access for scholars and may eliminate the need to retain archives of printed volumes, but electronic access has not had

any impact on the number of subscriptions in business libraries yet. Our contract with Elsevier for electronic access requires that we maintain subscriptions. In the past the articles concentrated on serial prices and methods used by libraries involved in periodical cancellation projects. Science libraries, especially chemistry and medical libraries, are the most represented in these studies. However, it is surprising that very few of these articles center on business, management, or economics libraries. I have only found four articles specifically on business periodical collection development, and only one of these is on journal cancellation. Goehlert did a study at Indiana University in the late 1970's on the use of journals based on an analysis of a document delivery service for faculty in economics and political science. He compared citation studies with journal usage.(Goehlert, 1978) In 1983 Robert Rose developed a list of 283 core periodical titles by correlating business index/database lists with citation analysis data from the *SSCI Journal Citation Reports*.(Rose, 1983) His list is still useful for building a business library, but not helpful in the deselecting of titles. Then in 1991 Belanger, Whitlatch, and McDermand wrote an article about general evaluation methods.(Belanger, Whitlatch, & McDermand, 1991) They reviewed the value of citation analysis, use surveys, user surveys, studies of uses, interlibrary loan, and indexes. Lee Pike at the University of Alabama wrote a short article on journal cancellations.(Pike, 1991) Several other articles have been written by management or economics faculty members on identifying the most important and influential titles in the business fields.(Brink & Shilliff, 1989; Johnson & Podsakoff, 1994; Sharplin & Mabry, 1985; Tahai & Meyer, 1999; Urbancic, 1983; Urbancic & Sailors, 1996; Wilson & Brooks, 1998) These are valuable to librarians in the selection process, but only help in a round-about way for deselecting serials. One

could compare current subscriptions with these core lists, identifying titles not on any of them, and then target those titles for deselection.

Many other articles have been written on methods used in libraries during cancellation projects. One of the earlier and more important articles is Flynn's report on the University of Pittsburgh's journal usage study. One of his very significant findings was that a small percentage of titles accounts for a great proportion of the usage.(Flynn, 1978) This confirmed the findings of Trueswell at the University of Massachusetts who was the first librarian to describe usage using the "80/20 rule", i.e. that 80% of the usage comes from 20% of the collection.(Trueswell, 1969) A frequently cited and very useful article is Broadus' 1985 publication which gives a good review of usage studies and how to do them.(Broadus, 1985) A more recent article is Butkovitch's review article on use studies.(Butkovich, 1996) Chrzastowski, who has been studying journal use in a chemistry library for many years, did a comparison of use studies done in 1988, 1993 and 1996.(Chrzastowski & Olesko, 1997) And similarly Naylor compared two use studies that used two different methods, one was a reshelving count and the other a self reporting by users.(Naylor, 1994)

Background on the Serial Cancellation Project:

Purdue is a major research institution with strong schools in engineering, technology, and agriculture, all areas with high periodical inflation rates. Enrollment is 37,000 students. The library system has over two million volumes and subscribes to over 20,600 periodicals and serials. It is a decentralized system with fourteen research libraries and an undergraduate library. At Purdue University we have had to face serial

cancellations less frequently than other research libraries, but in 1996/97 we faced the second one in less than five years. This prompted a need for a more objective method of deselection. In prior years the Library had received "bail-out" funds from the University administration. This time the goal was to cancel \$600,000.00. We approached this by involving the faculty from the onset. Emily Mobley, Dean of the Libraries at Purdue, asked each academic dean to appoint two faculty members to an Ad Hoc Committee on Serials whose charge was to *recommend a methodology and target amount for a serials cost containment* project. The committee developed a formula that considered **duplication rate** and **inflation rate**. More specifically the formula based the target amount for serial reductions in each library on the rate of inflation of their journals that was above 12.49% (or above 4% annually for the last three years) and their proportionate cost of duplicate titles. Besides determining the formula and amounts for each library to cancel, the Ad Hoc Committee highly recommended that the libraries use objective usage data and **base decisions in part on usage**. In disciplines where it was relevant, librarians were encouraged to use citation and publication data. In addition Librarians were also asked to preserve the periodicals needed by undergraduate students.

Creation of the Decision Support Database:

To assist librarians in the goal of deselecting titles based on objective data our Information Technology Department extracted all serial titles, subscription costs over the last three years, and publisher information from our online system, and imported this data to a Microsoft Access database. They also identified duplicate titles in this database. In addition information from the Institute for Scientific Information on the frequency that

faculty members at Purdue published in or cited specific journals was loaded into the database.¹ From this major database, smaller databases for each library were created. This was the beginning of a Decision Support System for each library. Head librarians in each of our research libraries could include additional data. Calculations could be done, and the database could be searched and sorted in a way that would streamline the identification of titles to cancel.

In the Management & Economics Library, the librarian and the school's standing Library Committee met and decided to follow the lead of the Ad Hoc Committee on Serials and use the following criteria to develop a list of potential cancellations:

1. All **duplicates** that are not primary to the fields of business/economics/management.
2. Titles that had **inflated significantly** during the past three years.
3. Titles that showed **low usage**.
4. To protect undergraduate oriented periodicals, all titles indexed *in Wilson's Business Periodicals Index* and *Social Sciences Index* were **excluded from the list**. (Several years ago the library selected the Wilson indexes as the major undergraduate sources and developed the collection to match the titles included in these indexes.)

Producing a Preliminary List of Titles to Cancel:

Duplicates: All duplicates were indicated in the database by a separate field, so searching and creating a list of all duplicate titles was easy. We started with a list of all duplicates; the Management & Economics librarians then reviewed the list and removed ones that were essential to the library because they were business titles. Examples of

titles that were removed from the potential cancellation lists were *Administrative Science Quarterly*, *Advertising Age*, *Business Week*, *Forbes*, *Fortune*, *Harvard Business Review*, *JMR--Journal Of Marketing Research*, *Journal Of Marketing*, *Sales & Marketing Management*, and *Survey Of Buying Power*.

The list of duplicates to cancel served as the start of the list of potential cancellations. These titles were tagged in the database in a separate field as "potential cancellations."

Inflation: The next step was to have the database calculate the rate of inflation between each year from 1992/93 and 1995/96, the first and last year that we had pricing data. The database was searched for titles inflating at over 4% each year between 1992 and 1996. Fifty-six titles qualified as high inflation titles. At this point we wanted to compare usage with inflation, so we went to the next step of gathering usage data.

Usage: Usage information was data that was missing from our Decision Support System Database. Although we could extract usage data from our online system, we had never consistently gathered this information on periodicals and serials. However, since our bound serial volumes were bar-coded,² we knew we could compile the data by scanning the barcodes before reshelving. Since we had several months lead time for the project, we had enough time to do a one semester sampling of usage data. Scanning the barcodes before shelving did add a step to the reshelving process, but the usefulness of the data warranted the extra work. Student assistants were trained to gather together all the bound journal volumes from the tables, reshelving carts, and copy machines. The barcodes were then scanned into the online circulation system in the same manner that a book is discharged. This generated a "browse" in the system. At the end of the period our

Information Technology Department extracted from our online system the "circulation" and "browse" statistics, and we merged this data into our Decision Support System Database. We then calculated a sum of the "circulation" and "browse" figures and searched the database for all serials that were used less than five times during the usage study. These titles were tagged in the database as potential cancellations.

We also wanted to correlate usage with inflation data. Eighty-eight titles in the database had an inflation rate of 4% or higher for each year in our study. However, we did not want to include in the list of potential cancellations high use titles, so we qualified the search of high inflating titles to those with less than ten uses. This produced a list of sixty-six titles. These were added to the potential cancellation list.

Excluding undergraduate titles: Since the Purdue Library System had selected the Wilson databases as the primary electronic sources for undergraduate research and developed the periodical collection to match them, we decided to exclude from the cancellation list any title indexed by the any of the Wilson databases. For the Management and Economics Library this meant excluding titles indexed in *Wilson Business Periodicals Index* and *Social Sciences Index*. We had this information in electronic format from another database, so we extracted it and loaded it into the Decision Support System Database. We then did a search of the database for titles that had been used less than five times and that were not indexed in any Wilson database. The field for potential cancellation was adjusted so the Wilson titles were not on the potential cancellation list.

Summary of steps taken to create the decision support system:

1. Extract serial titles, subscription costs over past three years, publisher information and import data into database management program.
2. Identify titles in database that are duplicated in other on-campus libraries.
3. Have database management system calculate inflation rates.
4. Identify titles in database that are indexed in high use periodical indexes.
5. Gather usage data from online circulation system and import it into database.
6. Query database for duplicates, review list, flag all non essential titles for cancellation in database.
7. Query database for low use titles; flag these titles for cancellation in database..
8. Query database for high inflation/low usage titles; flag these titles for cancellation in database.
9. Query database for titles flagged for cancellation; remove from this list any title indexed in primary periodical indexes.
10. . Create final list of recommended titles for faculty review.

Faculty Review of List: The final step was to create a report that listed the potential cancellation titles. In this report we listed the title, usage, inflation rate, current price, and an indication if the title was duplicated on campus. This report was then sent to all faculty members in the school for review along with a cover letter that summarized the Ad Hoc Serials Committee's conclusions. The list totaled over \$33,000.00, intentionally high, so faculty could ask to have specific titles "preserved" from cancellation. Many faculty members did send in suggestions of titles to continue. In almost all cases these suggestions were honored.

Involving the full faculty at the end of the process instead of asking them to recommend titles for the cancellation list was based on past experience. During the 1992/93 cancellation project, we had relied completely on faculty evaluation, as we had no usage data. Faculty members could identify the most important and prestigious titles, but they were unable to help select the unimportant, unneeded titles, those we needed to target for cancellation. Other librarians have noted the same. Fry conducted a study of 1,600 people in a survey from the membership of the American Marketing Association and the Academy of Management. The conclusions indicate that many of the respondents had no perception of the journal quality.(Fry, Walters, & Scheuermann, 1985) Other studies show similar results. Faculty ranking of journals does not correspond to usage.(Dole & Chang, 1996) Faculty members, when asked to identify journals to cancel, tend to respond as researchers and want to keep the research level titles at the expense of the more fundamental or introductory titles.(Joswick & Stierman, 1995) They are more influenced by price and publications prestige.(Broude, 1978) Asking faculty for suggestions is similar to looking at the core lists; useful for building a collection but not for reducing one. Soliciting their help at the end of the project to review the list of titles to be cancelled was productive; their recommendations were well-considered and saved us from canceling titles that were needed by researchers involved in special projects, but which showed low use. After review by faculty in the school, the list of all recommended cancellations campus-wide was made available to the entire university community for final review. At this point any faculty member could recommend saving a journal in any library. This was to be certain that important cross-

disciplinary titles were not cancelled. About \$10,000.00 worth of journals in the Management & Economics Library were saved due to faculty requests.

Final Cancellation List:

The final cancellation list included the following duplicate titles, which generated \$1,208.47.

Britain.

Computerworld.

Computerworld Client/server Journal.

Feedstuffs.

Indianapolis Star.

Journal of Conflict Resolution.

*Journal of Consumer Affairs. (part of membership in American Council on
Consumer Interests.)*

Journal of Transport History.

Membership in American Council on Consumer Interests.

Monthly Digest of Statistics. Great Britain.

Official Congressional Directory.

Psychometrika.

Statesman's Year-Book.

U.S. News & World Report.

Table 2 lists all the titles cancelled with information on usage, price inflation, cost in 1995/96 and a note field that explains the cancellation of unusual items. For example, several government documents were cancelled because we were transferring the depository copy from the Humanities-Social Sciences-Education Library to the Management & Economics Library. Some titles show no price for 1995/96. This occurs in cases where they are paid on a membership or a few unusual cases where they had not been paid at the time the data was extracted from online system. In those cases the final cancellation credit was based on earlier prices.. Final cancellations total \$23, 785.57.

Table 2

Follow-Up Study

The following year we did another journal usage study to evaluate whether the titles we had cancelled continued to be low use items. Of the 162 titles cancelled, five titles showed enough use that we reinstated them. Another seven titles are under consideration pending further usage reports. So 7.4 % of the titles we cancelled could be considered cancellation errors. If we had had a longer usage study we think this error rate would be reduced, although never eliminated entirely. Overall we think that using usage and inflation data and asking for faculty evaluation at the end of the process was a very effective method for identifying titles to cancel. The faculty accepted this

methodology, they saw it is objective, fair and effective. This was indicated by their cooperation in the cancellation process and lack of complaints both during and after the project.

Conclusion:

Using a database management system such as Microsoft Access to build a Decision Support System Database with data gathered from a library online system is now very easy to do. In this project we extracted usage data and then used it in conjunction with periodical prices and inflation rates to develop a potential list of periodical cancellations. This provided objective data that we could share with faculty members who then were actively involved in the final selection of titles to cancel.

¹ For the science libraries the ISI data was valuable information. For Management & Economics, the data was too sparse to be useful. Only 140 of our 1,033 had frequency published data and only 186 of the 1,033 titles had frequency cited data.

² Our unbound issues are not barcoded, so during this use study we did not capture the use of the current issues. Tracking bound volume use was considered more important as most students use periodical indexes such as *Wilson Business Periodicals Index* or *ABI/Inform* to identify articles for research. In order to track unbound issue we would have had to do a manual count. This could be accomplished by printing a list of journal titles. The unbound issues would be gathered with the bound volumes and taken to the circulation desk where the list of journal titles is kept. All unbound issues would then be counted and tallied by title in the list. This data would then need to be input into the database later.