SIMULTANEOUS USAGE OF ONLINE DATABASES IN ACADEMIC AND PUBLIC LIBRARIES

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Abstract: Pricing based on the number of simultaneous (concurrent) users is an attractive pricing option for many academic and public libraries. Anticipating the needed number of simultaneous usage ports, however, often requires guesswork. If too few simultaneous users are allowed, patrons may be frustrated; too many and the library is paying for unused access. Usage patterns for academic and public libraries help take the guesswork out of the simultaneous user calculation. Six months of usage data (July-December) from a random sample of approximately 200 academic and public libraries that access online databases from a major database aggregator show similarities and differences in simultaneous use depending on time of day, day of the week, and month. Averaged usage patterns reveal that consistent peak usage in all types of libraries occurs, on Mondays and Tuesdays, mid-day, and in the month of November. Simultaneous users vary from zero (the mode) to dozens, but over 99% of use in almost all cases can be met by providing access to five simultaneous users.

1. INTRODUCTION

The simple days of a single pricing option such as connect-time for commercial online databases is over. Online database distributors today offer a variety of pricing options and algorithms, often including multiple pricing options for the same product. The best pricing option for a given database varies from library to library and, even within one library, different pricing options for different databases may be desirable. Some databases may be used more frequently than others or used by a larger number of library constituents, so an unlimited site license is needed; others may see cyclical use depending on when schools are in session or when research projects are due, necessitating a pay-as-you-go plan or simultaneous use licenses.

Site licenses may be sold on a per seat (available to all users at all times) or simultaneous (concurrent) usage basis. For some high priority databases that have widespread appeal to almost all library users and must always be available, the per seat license may be justified. In an academic or public library, however, many databases are used by many, but not all users, or are not in constant demand. These databases may be candidates for simultaneous usage pricing.

Simultaneous usage licenses require the library to estimate how many simultaneous usage ports will satisfy most of the demand. Since prices typically are set by ranges of users--one user costs less than 2-5 users or 6-10 users, for example--accurate estimates save money for the library and frustration for the users. Purchasing access for too many simultaneous users wastes money; purchasing too little causes busy signals and frustration for users. Short of arranging trial database subscriptions for every database, deciding how many simultaneous users to support may be more guesswork than hard data. Librarians are more able to make the difficult decisions about pricing if they can anticipate usage patterns in their library. Information about usage patterns in similar types of libraries will help librarians to make more educated guesses.

This project presents usage data from a variety of academic and public libraries that access online databases from a major general-interest database creator and aggregator. Numbers of simultaneous users and usage patterns over time for a variety of academic and public libraries will help similar libraries anticipate usage.

2. REVIEW OF THE LITERATURE

Discussions about pricing to help librarians make good decisions have appeared in the professional literature over the last decade (Ref. 1-7). The number of pricing options has increased as databases are made available on a variety of platforms, including traditional online, the web, and CD-ROM (Ref. 8). Librarians, finding themselves in a more complex electronic environment, are demanding choices in pricing options depending on their individual situations (Ref. 9).

At last year's National Online Meeting, Tenopir, Banks, and Preston presented tips for selecting from among pricing options (Ref. 10). Site licenses with pricing based on number of users is becoming the most common pricing scheme for the institutional market. Simultaneous usage pricing is attractive for some resources in academic or public libraries because the interests of the constituents vary so widely. Simultaneous usage may be from workstations within the library, from remote logins, or a combination.

3. METHODOLOGY

A major database producer and aggregator provided us with access to the usage information for all of its online databases. This database aggregator provides online access to approximately 100 bibliographic, full text, and directory databases, forty-seven of which were used by libraries in our study. Online access is by end users through a library's workstations or by remote login by verified patrons.

Not all of the databases offered by this aggregator are unique. The same content, for example, may be sliced and diced in many ways. It may be available in a bibliographic-only version or a bibliographic plus full text version; in a complete version or an abridged version; a current version or a backfile version. Each library typically subscribes to only one version of a database, although it may subscribe to current and backfile versions of the same database. For the purposes of analysis, we have grouped all of the versions of the same title and refer to them as "database groups". Table 1 provides pseudonyms and descriptions for each database group we analyzed.

Over 1200 libraries offer online access to one or more of this company's products on its online system. Although it has all types of libraries as customers in many countries, this company's main customers are academic and public libraries in the United States and Canada.

GROUP NO.	PSEUDONYM
1	All databases (47)
2	Magazines and Journals for Academic Libraries (8 titles)
3	Magazines and Journals of General Interest for Public Libraries (11 titles)

Table 1. Database Groups Analyzed

A random sample of 200 public and academic libraries in the U.S. and Canada was taken from the total population of 1200 libraries. From these 200, a total of 99 public and 96 academic libraries had usable data. After selection, each library was categorized according to its size and type. Public libraries were categorized by user population (Table 2) and academic libraries were categorized according to Carnegie class of the parent institution (Table 3).

Category	User Population Served	Number in Sample
0	Unknown	6
1	under 25,000	11
2	25,001-50,000	10
3	50,001-100,000	17
4	100,001-250,000	20
5	250,001-500,000	18
6	500,001-1,000,000	13
7	over 1,000,000	7
Total		**99**

Table 2. Categories of Public Libraries

Category	Carnegie Class	Number in Sample
B1	Baccalaureate (Liberal Arts) Colleges I	7
B2	Baccalaureate Colleges II	9
M1	Master's (Comprehensive) Universities and Colleges I	32
M2	Master's (Comprehensive) Universities and Colleges II	3
D1	Doctoral Universities I	3
D2	Doctoral Universities II	7
R1	Research Universities I	14
R2	Research Universities II	6
AA	Associate of Arts Colleges	12
Bus	Schools of Business and Management	3
Total		**96**

Table 3. Carnegie Categories For Academic Institutions (Source: www.carnegiefoundation.org)

Data from each library were captured for a six-month period (July-December 1997). All users of each database were recorded once each hour (on the half-hour) from the hours of 8 a.m. to midnight.[1] These data allow us to draw usage patterns based on how many simultaneous users are accessing any database at any time. By separating the usage data by type and size of library and averaging usage patterns across similar libraries, we are able to draw typical usage patterns.

4. USAGE PATTERNS FOR PUBLIC LIBRARIES

Usage data from all of the 36 databases used by 99 public libraries in our sample were first examined in an aggregate. The number of simultaneous users for all of these databases and all public libraries range from zero users (the mode) to 39 users. (The mean is .30.) Modes or means for database usage are of limited value, however, as libraries want to provide a level of simultaneous use capability that will inconvenience the fewest people, without costing too much. More useful is a cumulative usage table that will show what percent of the usage will be satisfied by a certain number of simultaneous usage ports. Table 4 shows if a public library allows five simultaneous users, 99% of the time that will be sufficient. To provide satisfaction 100% of the time would be costly and inefficient.

Number of Users	Cumulative Percent
1	93.6
2	96.5
5	99.1
15	99.9
25	100.0
39	100.0

Table 4. Simultaneous Users, All Databases, All Public Libraries

The size of the user communities served by public libraries varies widely, so clearly the exact numbers of simultaneous users required will vary from library to library. Table 5 shows simultaneous users for all databases, but separated by size of public library. The trend remains the same across sizes of libraries--a cost-effective cutoff in the 90th percentile is evident for each category of library.

No. of Users	Cumulative Percent							
	Public Library Size							
	0	1	2	3	4	5	6	7
1	93.7	96.9	97.5	95.7	94.8	93.6	89.3	85.5
2	97.3	98.4	99.0	98.2	97.6	96.7	93.0	91.1
5	99.8	99.7	99.9	99.9	99.6	99.4	97.1	97.2
10	100.0	100.0	100.0	100.0	100.0	100.0	99.2	99.1
15	100.0	100.0	100.0	----	100.0	100.0	99.8	99.7
39	----	----	----	----	----	----	----	100.0

Table 5. Simultaneous Users, All Databases, Public Libraries By Size

Tables 4 and 5 depict usage patterns in the aggregate for all of the databases we analyzed. Table 6 shows usage patterns separated by library size for the database grouping "Magazines and Journals of General Interest." The same types of usage patterns are evident. Usage figures by size of population served confirm that larger public libraries require a greater number of usage ports.

Patterns of use by time of day, day of the week, and month (July-December) are depicted in Figures 1, 2, and 3, with a separate line for each public library size. (Figures appear after References.) Peak use times are similar, whether the library serves 25,000 constituents or a million; the busiest online use occurs mid-afternoon, early in the week, and in November.[2]

No. of Users	Cumulative Percent							
	Public Library Size							
	0	1	2	3	4	5	6	7
1	88.0	94.3	95.9	93.2	90.9	89.0	86.6	75.2
2	94.0	96.7	98.2	97.0	95.0	93.0	89.4	80.4
5	99.4	99.3	99.8	99.8	99.1	98.4	94.0	89.0
10	99.9	100.0	100.0	100.0	99.9	99.9	97.6	96.1
15	100.0	100.0	----	----	100.0	100.0	99.5	98.7
39	----	----	----	----	----	----	----	100.0

Table 6. Simultaneous Users, Magazines And Journals Of General Interest, Public Libraries By Size

5. USAGE PATTERNS FOR ACADEMIC LIBRARIES

Usage in academic libraries shows more variation by category, but patterns are surprisingly similar to the patterns of use in public libraries. We examined in an aggregate the usage data from 38 databases used by the 96 academic libraries in our sample. The number of simultaneous users for all of these databases and all academic libraries together ranges from zero users (as with public libraries, the mode) to 66 users. (The mean is .28.) As can be seen in Table 7, in general, if an academic library allows 15 simultaneous users, 99.9% of the time that will be sufficient.

When academic libraries are considered separately by the Carnegie Class of their parent institution, the usage figures vary less than public libraries usage by size. Table 8 shows simultaneous usage for all databases in academic libraries separated by Carnegie class.

Number of Users	Cumulative Percent
1	94.2
2	96.8
5	99.2
10	99.8
15	99.9
25	99.9
66	100.0

Table 7. Simultaneous Users, All Databases, All Academic Libraries

No of Users	Cumulative Percent									
	Carnegie Class									
	B1	B2	M1	M2	D1	D2	R1	R2	AA	Bus.
1	97.8	96.8	94.5	91.5	96.4	91.7	93.4	89.9	96.1	90.5
2	99.2	98.7	96.9	96.1	99.0	95.2	96.2	93.3	98.2	94.9
5	99.9	99.9	99.1	99.7	99.8	98.4	98.9	97.8	99.8	99.3
10	100.0	100.0	99.7	100.0	100.0	99.1	99.8	99.7	100.0	100.0
15	100.0	100.0	99.8	----	100.0	99.4	99.9	99.9	100.0	100.0
25	----	----	99.9	----	----	99.7	100.0	100.0	----	----
66	----	----	----	----	----	100.0	----	----	----	----

Table 8. Simultaneous Users, All Databases, Academic Libraries By Carnegie Class

Tables 7 and 8 aggregate usage from all of the databases used by the academic libraries. Table 9 shows simultaneous usage by Carnegie class for the database grouping "Magazines and Journals for Academic Libraries." This grouping includes the most heavily used databases in these libraries and provides more realistic usage numbers for popular databases.

No. of Users	Cumulative Percent									
	Carnegie Class									
	B1	B2	M1	M2	D1	D2	R1	R2	AA	Bus.
1	95.6	94.8	89.3	85.7	95.1	87.0	85.2	80.8	91.7	85.6
2	98.2	97.7	93.0	92.8	98.9	91.0	90.1	86.0	95.6	92.0
5	99.8	99.8	97.8	99.4	100.0	95.7	96.7	94.8	99.4	99.1
15	100.0	100.0	99.6	----	----	98.2	99.8	99.9	100.0	100.0
25	----	----	99.9	----	----	99.1	100.0	----	100.0	----
66	----	----	----	----	----	100.0	----	----	----	----

Table 9. Simultaneous Users, Magazines And Journals For Academic Libraries Database Group, By Carnegie Class

Patterns of use by time of day, day of the week, and month are similar regardless of database grouping or type of library. Figure 4 depicts average simultaneous usage patterns by time of day by Carnegie Class of academic institution for all databases together. Figure 5 shows the usage pattern for all databases by day of the week by Carnegie Class, and Figure 6 shows the monthly use patterns. Like public libraries, academic libraries have evident online usage patterns, although there is more variation by size of institution. The busiest time online is between 10 am and 5pm, Mondays and Tuesdays, in November. (It is likely that April would also produce such a peak.) It will probably not surprise many librarians that no one seems to want to be working on Fridays in the summer!

6. CONCLUSIONS AND FUTURE STUDY

Usage patterns seem to have more similarities than differences between public and academic libraries, size and type of libraries, and database groupings. This predictable behavior should help librarians in all sizes of academic and public libraries to estimate the number of simultaneous usage capability to purchase and to better manage workstation allotment and staffing patterns. Simultaneous usage needs are somewhat related to the size of the population

served by a library, but perhaps not exactly proportionately. The exact relationship between population and number of simultaneous users will be examined further. Certain databases require more usage capability, which may be lost in an aggregate analysis. Additional analysis will look at individual databases.

7. Notes

1. We have converted the hourly data into the local time zone for each library, but, since the database company's computer was set to Eastern time, data from libraries in western time zones begin and end earlier (7am-11pm (Central time), 6am-10pm (Mountain time), 5am-9pm (Pacific time), 4am-8pm (Alaska time) and 3am-7pm (Hawaii time)).

2. We do not know what percentage of these libraries allow dial-in access to these databases and what percent require users to come to the library, but we assume the majority of use comes from within the library.

8. References

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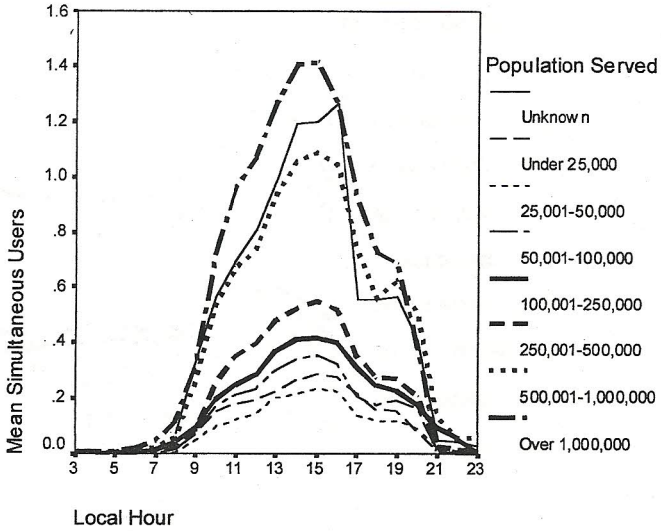


Figure 1. Average Simultaneous Use Patterns By Time of Day, Public Libraries By Size

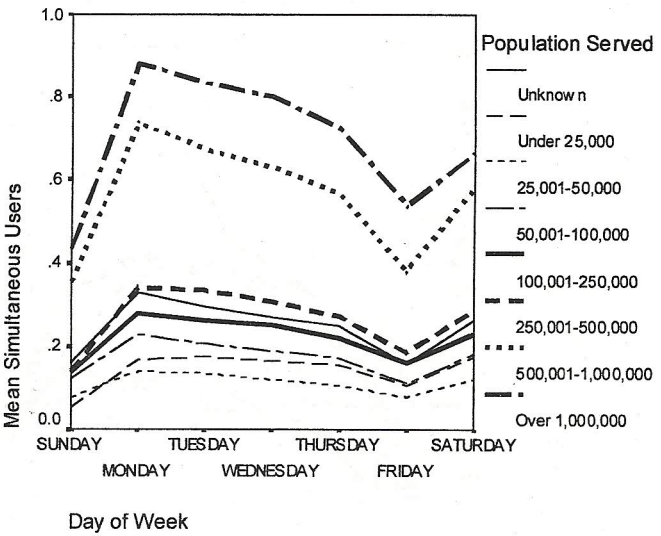


Figure 2. Average Simultaneous Use Patterns By Day of the Week, Public Libraries By Size of Library Community

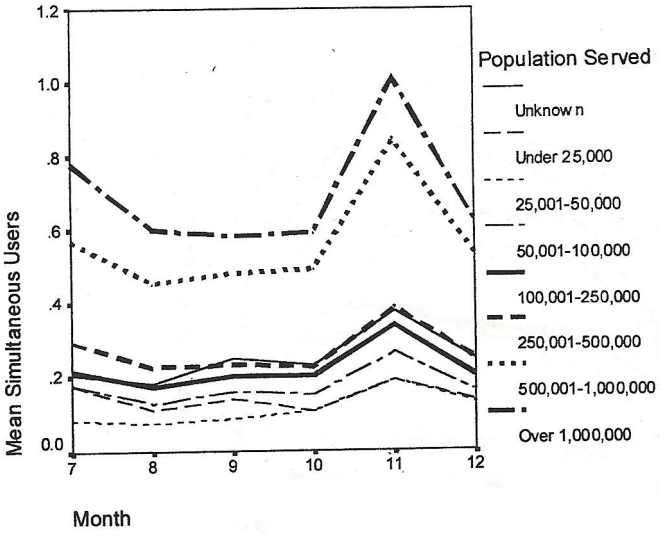


Figure 3. Average Simultaneous Use Patterns By Month (July-December) Public Libraries By Size of Library Community

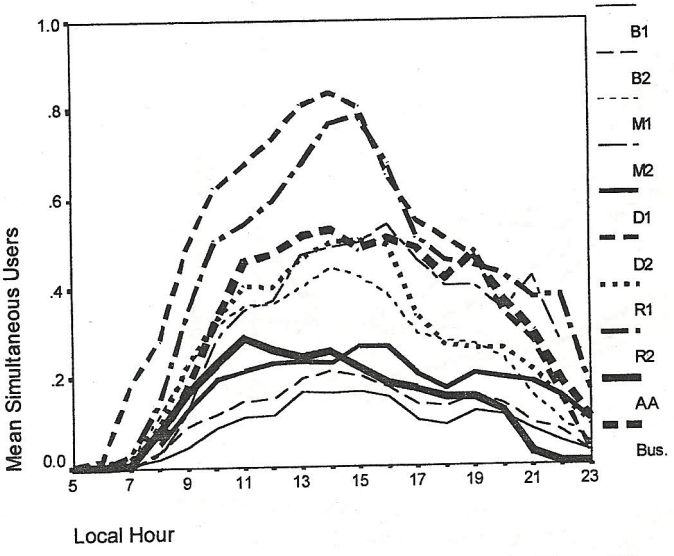


Figure 4: Average Simultaneous Use Patterns by Time of Day (Academic Libraries By Carnegie Class)

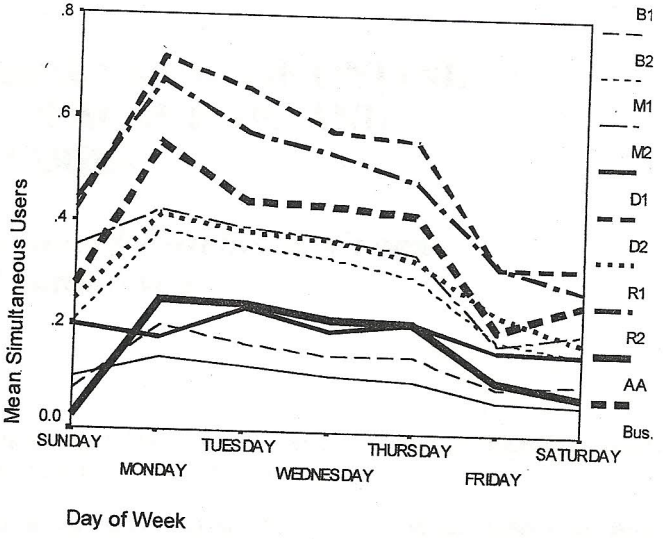


Figure 5: Average Simultaneous Use Patterns By Day Of The Week (Academic Libraries By Carnegie Class)

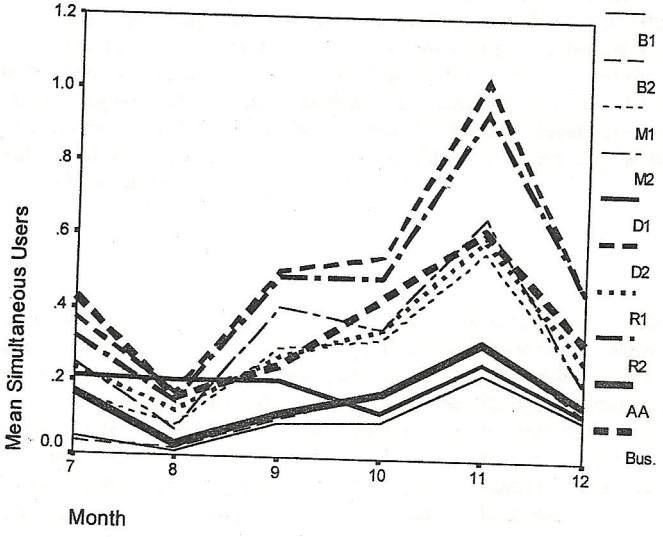


Figure 6: Average Simultaneous Use Patterns By Month (July-December) (Academic Libraries By Carnegie Class)