
The advent of remote, automated renewal services (phone based and web based) have had a significant impact on the way libraries and library materials are used. This paper studies these affects at one university library; Davis Library at the University of North Carolina at Chapel Hill, asking the question, what affect has automated renewal services had on the physical use of Davis Library?

Circulation and renewal statistics were looked at from 2000-2004, and exit count numbers were looked at from 2001-2004 in an attempt to answer this question. The statistics show that circulation of library materials has remained relatively stable during the period studied, but that there has been a dramatic increase in the use of automated renewal services, followed by a precipitous decrease in exit counts during the period under study, leading to the conclusion that automated renewal services have led to decreased physical usage of Davis Library.

Headings:

College and university libraries -- Circulation services
Circulation services - - Statistics
Circulation services - - Circulated Items
Circulation services - - Gate Counts
Circulation services - - Automated Renewal Services
The Effect of Automated Renewal Services on Physical Use of Davis Library at the University of North Carolina at Chapel Hill

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A Master’s paper submitted to the faculty of the School of Information and Library Science of the University of North Carolina at Chapel Hill in partial fulfillment of the requirements for the degree of Master of Science in Information Science.

Chapel Hill, North Carolina
February, 2005

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Introduction

With the introduction of widespread automation in library systems, new methods in the circulation of materials have become available, namely, for the purpose of this research project, the advent of automated renewal systems. Off site renewal systems in general have potentially created a major shift in the way materials circulate in libraries. No longer do patrons have to bring in their books every time their checkout period has expired to take them out again.

This study intends to try and answer an important question: Given automated renewal, would libraries see a noticeable drop in patrons checking out materials on-site, and consequently a drop, though possibly not as steep, in exit numbers?

This study proposes to focus on the question posed above, by studying the effects of automated renewal on Davis Library at the University of North Carolina. Namely, what effects have automated renewal had on the circulation of library materials and exit counts, and what this might mean for circulation desk practices and staffing at Davis library and libraries more generally?
For the purpose of this project I studied the circulation department at Davis Library at the University of North Carolina at Chapel Hill- -as a representative of large academic libraries in general- -to see whether they have seen a decrease in the number of patrons as measured by the number of materials checked out by circulation staff, and the number of patrons exiting the building. A formal presentation of my research question is - -has the advent of automated renewal caused a reduction in the physical usage of Davis library at the University of North Carolina at Chapel Hill?

**Literature Review**

Online renewal services are a relatively recent phenomenon. It wasn’t until the late 1990’s and the rise of the World Wide Web, coupled with widespread ownership of home computers that online renewal systems became a viable option, and to this point there has been little in the literature on the impact of online renewal systems. However, there has been a push for remote and automated renewal systems for some time. In fact Halcyon R. Enssle and Lou Anderson (1993) argue that we’ve entered a new information age and that older, manual library procedures need to be brought up to date (Enssle & Anderson, 1993). This is echoed by Lillian Jackson (1988), who emphasizes training users to use computer based resources for themselves, so that they won’t have to rely on library staff to help them so much.

This notion is similar to that espoused by Rose Kenyon and Dave Eckersley (2002) regarding the phone renewal service at the University of Salford. They already had a web based renewal system, but they felt their library also needed a phone renewal system to ease the burden on library staff manually renewing books for patrons over the
phone. Some of the goals of the new system included, making users more self-sufficient and moving the library towards 24-hour service. Using this system users are able to access their account via phone by punching in their card number, which then allows them to renew materials. One complaint that users had of the system was on the access of the computerized voice (Kenyon & Eckersley, 2002), a compliant echoed by users accessing the University of North Carolina Library’s phone renewal service.

Kenyon and Eckersley (2002) report that 24% of renewals are handled by phone and 9% of all phone renewals are handled by their automated system; almost 50% when school is not in session, seeming to imply that Salford continues manual phone renewals as well.

The authors go on to discuss the system at other, unnamed libraries, which report that 30% of all renewals are handled by the automated phone system (Kenyon & Eckersley, 2002).

Other phone renewal systems have also been proposed. Eileen Milner (1997), rather oddly, argues that libraries should have centralized phone banks dedicated to dealing exclusively with phone based queries, basing this model on the call centers used by corporations implying that libraries should have staff dedicated to specifically to this task. She feels such an arrangement would increase patron satisfaction (Milner, 1997). Such an arrangement makes sense for a company with hundreds of thousands of customers, but it seems unlikely that such a setup would ever be implemented in a library setting as it seems like very few libraries would have the volume of calls or the money to justify having staff dedicated to just manning the phones, even if it were just during certain hours.
North Carolina State University has its own customized web portal, and remains one of a handful of libraries to have one, as discussed by Joe Zhou (2003). North Carolina State University’s portal provides patrons online access to their checkout records, which would, likely, though not explicitly stated, include online renewal services. He agrees that the overriding concern of such sites should be patron customization.

Michael R. Ward (2001) in his article strikes more to the heart of the issue of how online renewal services might potentially affect patron usage of libraries. He doesn’t explicitly deal with library systems, instead focusing his research on the impact of online shopping versus traditional retail and catalog shopping. His discovery was a positive one as far as books go that as far as the average consumer’s spending habits, online shopping doesn’t seem to detract from traditional retail shopping. If I may take the liberty of extrapolating from his research, patrons still like to go the library and browse the shelves, something that is difficult to do given current online systems—though Amazon.com and similar book related sites are highly conducive to this—suggesting that online renewal systems should have little impact on library usage.

Barbara Baruth (2002) in her article takes it as given fact that patron usage of academic libraries has declined in large part due to the vast array of digital and online services that patrons can use remotely. Yet, she argues that, at least for reference librarians, this doesn’t mean there will be a decreased need for their services. In fact, she argues the opposite, that the traditional 9-5-reference librarian is a thing of the past, and that patrons are increasingly demanding reference services late into the night, as students
call in seeking guidance on how to navigate the often-vast array of reference services available to them online.

This trend continues to gather traction. Google, the online search engine, plans to digitalize the holdings in major collections, including those at Harvard, Stanford, the University of Michigan, Oxford University, and the New York City Public Library, creating a unified, searchable catalog, a paradigm that is likely to be followed by other search engine providers. Google will be restricted to providing full text for titles no longer under copyright and providing sample pages for other titles (Markoff & Wyatt, 2004). Still the project seems to herald a major shift for the future of the library. For example, the project hopes to integrate the search algorithms used by Internet search providers with previously unavailable collections (Battelle, 2004). Michael A. Keller, head of Stanford University Libraries, feels that the current digitization trend will result in most of the world’s knowledge being made available online within twenty years (Markoff & Wyatt, 2004). A rather grandiose notion as there is certainly bound to be a point of diminishing returns where it just is not economically feasible to digitize very specialized, low use titles, meaning that large swathes of information will still be unavailable.

Katie Hafner (2004), points this out giving numerous examples such as letters, diaries, and old issues of journals and newspapers.

Still, the push continues as libraries themselves, irrespective of Google’s project, are also pushing E-books, as New York City public libraries launched an E-book program in 2004 and more than 1,000 E-books were checked out in the first eight days of the program with another 400 put on hold, as there were more interested parties than
available E-copies (Gnatek, 2004). Still, what affect, if any do E-books have on the circulation of physical materials?

Justin Littman and Lynn S. Connaway (2004) found that at Duke University Libraries that of 7,880 titles available as online checkouts and in print that the print copies circulated 6,139 times in the year before the introduction of the E-book, but decreased to 4,738 times in the year after the introduction of the E-book, a decline of 22%, at a time when general circulation of print materials rose 5.2%.

The article “Universal Borrowing – a Library Model of ‘Bricks ‘n Clicks’” in the *Georgia Library Quarterly* agrees that there is has been a decline in the physical use of libraries by patrons, as web services have become available, but the author of this article seems to welcome the chance to bring patrons back to the library through the very medium that is keeping them away. He proposes following a business strategy by showing patrons just what is available in their local library (“Universal Borrowing,” 2002).

Perhaps the drive towards ever increasing automation and remote access has been too successful. Martha Kyrillidou (2000) shows that median usage of circulation and reference services at member libraries of the Association of Research Libraries have at best stagnated. From 1991 to 1999 member libraries experienced a 0.3% decline in reference services provided and only a 0.1% increase in circulation numbers. Though these numbers are somewhat deceptive, as circulation and reference numbers continued to increase until 1996 at which time they began decreasing back down to 1991 usage levels, while the student population remained basically flat throughout the period.
(Kryillidou, 2000). It is this author’s conjecture that 1996-97 began the real rise of the Internet on university campuses, thus leading to the decline in usage of other services.

The Epic Project at Columbia University did a study of library usage patterns that show that many users, particularly students, never venture very far beyond resources they can find online. The study goes on to say that though students still visit the physical library, to study, and somewhat ironically to use library-computing resources, the library as such, is becoming virtual, as users search library resources remotely. 20% of students reported that they often rely only on information they can access remotely instead of going to the library to retrieve materials (“EPIC Initiative”, 2004).

Scott Carlson (2001) feels that the trend towards pervasive electronic resources will lead to the obsolescence or at least the decline of the traditional library. He gives several examples. For example the University of Idaho at Moscow reported a 20% decline in circulation and exit count numbers between 1997-2001, while online database searches went up 850% between 1999-2001. He also discusses the Augusta State libraries, which saw gate counts drop from over 400,000 in 1992-3 to 271,977 in 2000-1.

One suggested solution to this problem, mentioned in Carlson (2001), is to make the building itself user-friendlier, such as adding cafes, so that libraries can compete with local bookstores, which have also accelerated the downward trend in library usage. Texas Christian University Libraries followed this model, doubling its weekly gate counts from 8,500 in 1997 to 15,000 in 2001, though circulation numbers continued to decline from 180,000 in 1997 to 148,000 in 2000(?). Carlson points out that like most other libraries TCU has made a big push towards digitizing many of its resources,
seeming to suggest that merely upgrading the building will be little help in increasing usage of physical library materials given other pressures.

Still, as discussed by Harold B. Shill and Shawn Tonner (2004), upgrading library facilities does seem to on average bring about a quantitative increase in building usage. Their study supported the evidence above that while library improvements can bring major increases in library traffic they have a smaller impact on actual usage of building materials, as the gate count increase for new or renovated libraries was 80.0% with a median increase 37.4%, while the circulation numbers improved by 44.8% with a median of −4.1%.

The article continues with reasons as to what building features enhanced building usage and which did not, giving no more attention to materials usage. For example, their findings showed the building size and location appeared to have little bearing on library usage. They also concluded that having widespread access to Internet access ports was a strong contributor to increased library usage, but that paradoxically increasing wireless access seemed to have little affect on usage improvements, and in fact libraries without wireless access seemed to grow more quickly than those with wireless access (Shill & Tonner, 2004). I believe this can be explained by the period of the study, 1995-2002, during which time wireless networking was a relatively nascent technology as far as the average user was concerned. It seems unlikely that a study undertaken today would display similar results, especially among at university libraries at schools that require students to own laptops, such as the University of North Carolina. Tim Gnatek (2004) seems to agree with this assessment as he points out stating that setting up wireless hotspots is one of the best ways to attract people into the library.
According to Shill and Tonner (2004), increased access to Internet ready workstations did appear to make a positive contribution to library usage, as 1/3 of libraries offering 100 or more public workstations enjoyed building usage increases in excess of 100%, while 40% of libraries offering fewer than 20 public workstations suffered usage declines. Finally, comfortable, well-lit working spaces and high quality instruction labs were seen as contributing to increased library usage. In fact, high quality instruction labs, i.e. higher quality technology, were found to be the most significant factor in increasing usage numbers.

Others, such as Doug Johnson (2003) agree that improving facilities increase library usage. He suggests that if libraries do not provide a safe, comfortable environment then users will stay away. He also feels that libraries act as a socializing force, a place where people can come together. He also argues that libraries provide services that most users just cannot perform for themselves, such as sifting through the mounds of available information, determining what is useful and what is not, a task that librarians are well trained to perform. In fact he sees the Internet as a complement to what libraries provide users, much as ATMs enhance bank services (Johnson, 2003). George R. Plosker (2003) expands on this notion, arguing that the Internet allows reference librarians to enhance their responses to patron queries.

Herbert S. White (2003) echoes the view that librarians are highly skilled in the role of information mediators, sifting out useless information, and though he seems to suggest this is the role librarians of the future should embrace he does not go so far as to endorse it, leaving it to librarians themselves to decide the direction that their libraries
take, though he cautions them to look beyond the book, to include the wide range
information formats that are out there.

Evan St. Lifer and Michael Rogers (1995) also agree with this notion, and suggest
that the Internet provides a great opportunity not only to educate users, but in essence, to
build a global library (St. Lifer & Rogers, 1995). This model is somewhat similar to that
followed by the University of Texas system in dealing with distance learners, students
who use library resources but rarely venture into a university library. The University of
Texas system has set up a web based bibliographic tutorial, further enabling users to
work remotely (Braun, 2002).

The role of the librarian then is becoming in many ways one more of computer
instructor, including such basic skills as how a computer works to how work with basic
applications (Braun, 2002).

However, not all is doom and gloom. Library usage seems to be improving
according to Andrew R. Albanese (2003). He points to the example of Rhode Island
College, among others, whose gate count numbers declined from 331, 530 in 1993-1994
to 240,948 in 1998-99, but have begun to rebound, with 282,501 visitors in 2001-02, the
best total since 1995-96, with better numbers projected for 2002-03. Albanese feels that
libraries loosening their restrictions on food and drinks, and providing comfortable
seating have driven this, becoming more like major chain bookstores. Libraries in
Albanese’s opinion have become major technological hotspots, making it easier to lure
people in. He also concludes that people have come to realize that maybe everything
they need is not on the Internet, and that a lot of useful material can still be found only in
libraries, as circulation numbers at Rhode Island college are on the rise, no doubt helped,
by the relative unpopularity of E-books at the school, though Albanese notes that libraries have not seen a similar rebound in reference questions and periodical usage.

The use of technology to spur library usage, whether intentionally or not is shown by Margaret Gordon, Andrew Gordon, and Elizabeth Moore (2001) who highlight the work of the Gates’ Project, an endeavor by Bill Gates to bring computers to poor, rural libraries. The results so far show that as patrons come in for free computer access they also take advantage of other library resources. Gate counts have also increased, for example in Arkansas and Louisiana libraries that have taken part in the Gates’ program have seen gate counts increase by an average of 36%, and 1/3 of surveyed Gates’ computer users in Alabama and Louisiana reported they had never visited or rarely visited the library (Gordon et al, 2001). It seems that computers can in fact bring in new library users, who then discover the diversity of resources available therein.

The trend towards increasing usage of library materials was demonstrated in a survey of American Public Libraries using an index system. “The index scores (1994-2003) are computed by dividing each library’s reported circulation and expenditures by its corresponding 1990 figures and multiplied by a 100. The resulting scores are ranked from highest to lowest for each year, and the median score is selected as the index value. The indexes are then recalculated back to 1994, with a value of 100, representing the year 2000” (Clevinger, 2004, pp. 47-48). Using this formula library circulation rose 6%, the index score rising from 108 to 115 between 2002 and 2003 (Clevinger, 2004).

In conclusion there seems to be a lively discussion in the literature in how to respond to current and future trends in library usage, but no one disagrees about the increasing orientation towards online services and remote users.
**Experimental Methodology**

This project proposes to study the effects of automated, specifically online or web based renewal systems as well as phone based renewal systems on library usage patterns, and their potential effects on library operations, such as a need for reduced staffing if fewer patrons are using the circulation desk. The question under study is--has the advent of automated renewal caused a reduction in the physical usage of Davis library at the University of North Carolina at Chapel Hill? This question can be broken down into several sub-questions. 1) Have the automated renewal services at Davis Library at the University of North Carolina led to a decrease in the number of materials checked out from the library? 2) Have the automated renewal services at Davis Library at the University of North Carolina led to a decrease in the number of patrons coming into the library? 3) What do the answers to the above the previous questions mean for Davis Library?

I studied these questions using a three-pronged method, looking at the book circulation statistics from the Davis library at the University of North Carolina at Chapel Hill, which includes statistics on items renewed through the automated renewal services available at Davis library, i.e. web and phone based renewal options, and the exit totals from the same library.

The first sets of statistics I looked at were the book circulation statistics from July 2000 to June 2004, the library keeping statistics based on the fiscal year (July to June). They have the most relevance in determining whether there has been a drop in patron use of the circulation desk by clearly showing whether there has been a drop in the
circulation of library materials as materials renewed at the circulation desk are counted as
being new checkouts, though a number of extenuating circumstances need to be
accounted for. First, for a period of several years Davis library also served as the home
for the university’s undergraduate library. Leading one to anticipate a dramatic spike in
circulation numbers, as the entire Undergraduate library’s materials were placed in
storage, and though accessible, their use was inconvenient enough to lead to wider use of
Davis library materials where there was overlap. Secondly, the University’s enrollment
has increased during the past few years, for which a proportional rise in circulating
materials would also be expected.

The second sets of statistics I reviewed were the renewal statistics for Davis
library from July 2000 to June 2004. Renewals are tracked as a separate item in the
Davis library circulation statistics. This is because library items that are renewed are
with rare exceptions items that have been renewed remotely, i.e. through automated
methods. This is due to the fact, noted earlier, that Davis library follows different
procedures when renewing an item that is physically brought to the library. The statistics
should show that as the use of automated renewal systems increased the number of
materials checked out at the Davis library circulation desk decreased, or concurrently that
if there has been a decline in renewals, that there has been a rise in the number of
materials circulated from the circulation desk. The rise in enrollment that likely effects
circulation desk numbers would also be expected to influence automated renewal use, as
well as several factors, that might be difficult to control could also come into play in
evaluating the available data. First, numbers would likely be low when the service was
first implemented as people wouldn’t know about the service, thus a natural rise in
automated renewal use would be expected as people come to find out about the service. Secondly, a further natural rise would be expected as more people every year purchase computers and establish Internet access, factored in with the overall rise in the university population.

Thirdly, I studied Davis library exit statistics for the past three and one half years, searching for a rise or fall in exit number, which should give a very clear indication of increased or decreased library usage. Factors that need to be controlled for are similar to those for circulation numbers, namely the presence of the Undergraduate library nested into Davis library, and the increase in university enrollment in the past several years.

To obtain these records I had to obtain the permission of the circulation librarian at Davis library, Mitchell Whichard. He let me view, copy, and make use of the necessary materials without any qualifications on their use.

**Significance of Work**

The progress towards automation in library operations has expanded at an exponential rate, and shows no signs of abating, and automated renewal systems and automated systems in general should grow apace to the point that virtually every library in the United States, regardless of its size, will have or already has some form of automated renewal. This is where my research is so important in determining what this means for the personnel side of library operations. Given the omnipresent budget crunch most libraries across the country face, regardless of general economic conditions, most libraries would welcome information that pointed to a decreased need for library staffing that my research hopes to demonstrate.
Given our technology driven climate, if a technical service is offered it is very difficult to withdraw it without arising the ire of patrons. While cutting staff to save money would be perfectly fine with most patrons as long as there isn’t any deterioration in general service, which should be possible if there is a reduction in patron use of libraries and library circulation desks. My research should help point the way to what is likely the future of libraries, less, more highly skilled staff working in highly automated environments, making them in many ways more akin to IT professionals than traditional library staff.

This will also have important ramifications for library training and library schools in general. Will library schools move away from their traditionally taught skill set and move more and more towards information science to the point that they are virtually indistinguishable, and will there be a reduced need for library schools in general as fewer personnel are needed to staff the average library? These questions are obviously far outside the scope of the work proposed here, but I hope that my work can be a first foray into the future of libraries and library systems, and that other scholars can build upon the work proposed here.

**Experimental Results and Discussion**

There is a fairly significant distinction, as mentioned earlier, in the circulation numbers for Davis Library at the University of North Carolina which makes it very easy to differentiate between items checked out onsite and those renewed remotely, i.e. electronically via the phone renewal system or the web renewal system. The circulation desk at Davis Library has a stated policy of checking in and then checking back out each
item brought in for renewal, thus any such item will count as a new check out and not a
renewal for statistical purposes. Thus items marked as charged are items checked out
onsite, and items marked as renewed were done so via either the phone renewal or the
web renewal system. The circulation numbers for Davis Library show several fairly clear
trends, as shown in Tables 1.0 to 1.3 and Figures 1.0 to 1.3. First, the number of items
checked out at the circulation desk has remained relatively stable. Each year under study
showed a clear pattern with circulation and renewal number at a low point at the
beginning and end of each fiscal year with numbers tending to peak in October or
November with a significant drop during December during the Christmas holidays.
Numbers began improving each January as school resumed, peaking in April, and then
falling off through the summer.

Table 1.4 and Figure 1.4 show that 301,217 items were checked out in 2000-
2001, reaching a peak of 319,915 items in 2001-2002. The circulation numbers begin to
decline the next year with 198,594 items checked out in 2002-2003 and 202,308 items
checked out in 2003-2004. The seemingly precipitous decline in circulation numbers can
be explained by the fact that there were no numbers for March through June of the 2002-
2003 fiscal year, as shown in Table 1.2 and graphically in Figure 1.2, nor were there
numbers for September, October, and June of the 2003-2004 fiscal year, as shown in
Table 1.3 and graphically in Figure 1.3. Looking at the attached tables of circulation
numbers it clearly shows that for every given year March, April, September, and October
are months with a significant numbers of items checked out, therefore leading to the
seemingly steep decline in circulation totals. It is unclear why these months went
unrecorded, though several different sources were consulted, each bearing the same omissions.

The second noticeable trend has been the skyrocketing usage of the offsite, automated phone renewal and web based renewal systems. Table 1.4 and Figure 1.9 show that 67,743 items were renewed in 2000-2001, 86,207 items were renewed in 2001-2002, 68,942 items were renewed in 2002-2003, and a whopping 126,501 items were renewed in 2003-2004. There was one noticeable difference in the renewal patterns from month to month as compared to circulation patterns, as shown in Tables 1.0 to 1.3 and Figures 1.5 to 1.8. First, the beginning of the fiscal year, July, marked a relatively heavy time for renewals when compared with checkouts, with renewals plummeting the next month and then slowly building back up with renewals topping out in the November to December timeframe.

The item of note however in the renewal statistics is the relentless rise in the use of remote renewal from year to year. Table 1.4 shows that there was almost as a 20,000-volume increase in usage from 2000-2001 to 2001-2002. Looking at Table 1.2, Table 1.4, Figure 1.7 and Figure 1.9 there was a drop in 2002-2003, which can be explained by four months of unavailable statistics, but extrapolating data for the missing year from the numbers of the previous year would add 32,700 renewals to the years total, bring the yearly tally up to 101,642 a clear increase from the year before, even if the extrapolated month remained steady from the year before. Certainly the largest increase by far is noted in the 2003-2004 school year (as shown in Table 1.3, Table 1.4, Figure 1.8 and Figure 1.9), topping the total for any other year by more than 40,000 items, despite no numbers for three months. Extrapolating those months (September and October from
2002-2003, Table 1.2, and June from 2001-2002, Table 1.1) from earlier years gives the 2003-2004 school year a renewal total of 149,957 items, a tremendous increase from the year before.

There seems to be several reasons why this should be. One is that Davis library has gone to some trouble to make users aware of offsite renewal services. The Davis Library circulation desks have offsite renewal instruction sheets posted at every circulation station. The library has also given the online renewal option a prominent place on their website, with a link allowing users to access their account listed on the upper right side of the page, which has probably resulted in increased awareness of the program. Secondly, computers are ever more prevalent in our society, making it more likely that people will access resources remotely. In fact, the University of North Carolina requires incoming freshman to have a laptop computer, resulting in a very large potential base of remote renewal users. Finally, and really an addendum to the above notion, users are more than likely just more comfortable with the Internet and computers in general.

Thus have automated renewal services led to a decline in the circulation of materials at Davis Library? The answer appears to be yes, though not as much as might be expected from the large increase in the usage of automated renewal services.

The exit count numbers have shown a far more precipitous decline. Gate counts are in no way a precise number. They are really more estimates, as the often the same patron will pass through the exit gates multiple times during the day, oftentimes during the same visit, particularly if they are studying and need to take periodic breaks. The following tables and figures (Table 2.0, Table 2.4, and Figure 2.0 and Figure 2.4) show
that 1,583,210 patrons passed through the exit gates in 2001-2002. The numbers fell off significantly in the 2002-2003 fiscal year, as shown in Table 2.1, Table 2.4, Figure 2.1 and Figure 2.4, with 1,050,286 patrons passing through, with number continuing to fall off the next year to 989,475, as shown in Table 2.2, Table 2.4, Figure 2.2 and Figure 2.4. The numbers for fiscal year 2004-2005 are incomplete but show a continued decline. 489,410 patrons passed through the exit gates from July to December 2004, as shown in Table 2.3, Table 2.4, Figure 2.3 and Figure 2.4. 817,648 passed through the exit gates in the same period in 2001, 567,537 in 2002, and 508,202 in 2003.

Through any given fiscal year exit counts tend to follow the pattern exhibited earlier in the circulation numbers, as shown in Tables 2.0 to 2.3 and Figures 2.0 to 2.3. The summer months tend to be a fallow period for exit numbers with numbers rising each August from the July numbers with a big jump taking place each September with the numbers continuing to rise, peaking in October or November. The numbers then tail off in December, beginning to rise again in January as classes resume, with the numbers peaking in April before dropping off significantly in May and June.

Has automated renewal led to a decrease in physical use of Davis Library at the University of North Carolina? The answer is yes. So what can be deduced from the decline in exit numbers? One significant impact was the Robert House Undergraduate library moving out of Davis library and back into its own building, as the Undergraduate library for several years was located on the second floor of Davis library while its own building was being refurbished. The Undergraduate library more than likely added significantly to the traffic at Davis library as the Undergraduate library housed all of the reserve readings for undergraduate classes, and with the closing of their physical building
students were denied a significant study area. The impact of the move back to its own building is clearly shown by the precipitous drop in exit count numbers between 2001-2002 and 2002-2003, as shown in Table 2.4 and Figure 2.4 when the yearly exit count declined by 33.7%. Still the move of the Undergraduate library does not seem to account for everything. As the exit count numbers have continued to decline in the years and months since it left. It therefore seems almost certain that the impact of electronic offsite renewal services have contributed to this decline, as offsite renewal number have, when extrapolated from previous numbers, gone up every year, as shown in Table 1.4 and Figure 1.9, skyrocketing in 2003-2004, while circulation numbers continue to decline, though in a far less dramatic fashion. Still, such a decline, if it continues is bound to affect the library in upcoming years in such areas as budget and staffing levels.

**Conclusion**

Has the advent automated renewal caused a reduction in the physical usage of Davis library at the University of North Carolina at Chapel Hill?

1) Have the automated renewal services at Davis Library at the University of North Carolina led to a decrease in the number of materials checked out from the library? There has been a decline in the circulation of materials, but a large part of this can be explained by extenuating circumstances, namely the removal of the Robert House Undergraduate Library back into its own facility and gaps in the circulation numbers for the last two years under study (2002-2004), making it unclear just how much of an effect automated renewal has had on circulation totals.
2) Have the automated renewal services at Davis Library at the University of North Carolina led to a decrease in the number of patrons coming into the library? It clearly seems that this is the case as shown in the experimental results above. Library usage as plummeted during the years under study, though a significant part of this can be attributed to the moving of the Robert House Undergraduate Library back into its own building, though the decline continues, though not as precipitously as might be expected given the dramatic rise automated renewals.

3) What do the answers to the above the previous questions mean for Davis Library? It appears that automated renewal services, while having some effect on library usage are not at this time likely to lead to significant revisions in the ways that libraries do business. However if the downward trend in exit totals continues it is likely that Davis Library might well see a redistribution or outright cuts in its funding, leading either to even more remote automated services and/or a decrease in staff.

Automation and online library services are now a fact of life in libraries around the world, where even the least sophisticated rural libraries are now being asked to perform services (online renewal, virtual reference desks for example) that would have been difficult if not impossible only ten or twenty years ago, a trend that is only going to increase as people become more and more comfortable with the Internet. It is thus important for information professionals to see what the library of the future will look like, and what impacts this will have not only on patrons, but for library personnel as well, particularly as regards library staffing issues, the future orientation of the librarian’s skill set and what this means for library training in general.
My research has hopefully taken a small step in that direction by ferreting out the impact online renewal systems have had on library usage, specifically on circulation services, via the test case of the circulation desk at the Davis Library at the University of North Carolina at Chapel Hill, though obviously there is still a great deal of research that needs to be done.
### Tables and Graphs

#### Table 1.0

**July 2000-June 2001, Items Checked out and Renewed**

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<tbody>
<tr>
<td>Charged</td>
<td>17063</td>
<td>19082</td>
<td>27036</td>
<td>28874</td>
<td>34323</td>
<td>21780</td>
<td>24605</td>
<td>26024</td>
<td>29114</td>
<td>34398</td>
<td>22008</td>
<td>16910</td>
</tr>
<tr>
<td>Renewed</td>
<td>10885</td>
<td>3971</td>
<td>3824</td>
<td>5506</td>
<td>6760</td>
<td>5682</td>
<td>4844</td>
<td>5099</td>
<td>6393</td>
<td>6380</td>
<td>4576</td>
<td>3823</td>
</tr>
</tbody>
</table>

#### Table 1.1

**July 2001-June 2002, Items Checked out and Renewed**

<table>
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<tbody>
<tr>
<td>Charged</td>
<td>17028</td>
<td>16537</td>
<td>27917</td>
<td>33681</td>
<td>39534</td>
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<td>30176</td>
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<tr>
<td>Renewed</td>
<td>6617</td>
<td>2688</td>
<td>3951</td>
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<td>9251</td>
<td>10620</td>
<td>7088</td>
<td>5741</td>
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</tbody>
</table>

#### Table 1.2

**July 2002-June 2003, Items Checked out and Renewed**

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<tbody>
<tr>
<td>Charged</td>
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<td>19126</td>
<td>27306</td>
<td>30668</td>
<td>35652</td>
<td>17787</td>
<td>25043</td>
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<td>N/A</td>
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<tr>
<td>Renewed</td>
<td>6992</td>
<td>5859</td>
<td>8350</td>
<td>9365</td>
<td>11332</td>
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<td>9540</td>
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<td>N/A</td>
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#### Table 1.3

**July 2003-June 2004, Items Checked out and Renewed**

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<tbody>
<tr>
<td>Charged</td>
<td>15933</td>
<td>16011</td>
<td>N/A</td>
<td>N/A</td>
<td>31623</td>
<td>18808</td>
<td>21891</td>
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<td>29535</td>
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<tr>
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<td>8707</td>
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<td>N/A</td>
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<td>14038</td>
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<td>14585</td>
<td>17161</td>
<td>20207</td>
<td>11389</td>
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#### Table 1.4

**Yearly Items Checked out and Renewed, June 2000 - July 2004**

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<td>Charged</td>
<td>301217</td>
<td>319915</td>
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<td>Renewed</td>
<td>67743</td>
<td>86207</td>
<td>68942</td>
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Figure 1.0

July 2000 – June 2001, Davis Library Circulation Totals
Figure 1.1
July 2001 – June 2002, Davis Library Circulation Totals
Figure 1.2

July 2002 – June 2003, Davis Library Circulation Totals
Figure 1.3

July 2003 – June 2004, Davis Library Circulation Totals

Figure 1.4

July 2000 – June 2004, Davis Library Yearly Totals
Figure 1.5

Figure 1.6

Figure 1.7


Figure 1.8

Figure 1.9


Table 2.0

July 2001-June 2002, Davis Library Exit Counts

<table>
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<td></td>
<td>72067</td>
<td>103780</td>
<td>167411</td>
<td>178738</td>
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<td>183113</td>
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<td>69385</td>
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Table 2.1

July 2002-June 2003, Davis Library Exit Counts

<table>
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</thead>
<tbody>
<tr>
<td></td>
<td>73414</td>
<td>81541</td>
<td>112445</td>
<td>108990</td>
<td>104385</td>
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<td>87529</td>
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<td>90569</td>
<td>109187</td>
<td>59506</td>
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Table 2.2

**July 2003-June 2004, Davis Library Exit Counts**

<table>
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<tr>
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</thead>
<tbody>
<tr>
<td>Davis</td>
<td>45132</td>
<td>47529</td>
<td>108869</td>
<td>112892</td>
<td>105076</td>
<td>88704</td>
<td>76847</td>
<td>96800</td>
<td>97083</td>
<td>116684</td>
<td>48968</td>
<td>44891</td>
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Table 2.3

**July 2004-December 2004, Davis Library Exit Counts**

<table>
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<tbody>
<tr>
<td>Davis</td>
<td>38804</td>
<td>53256</td>
<td>105614</td>
<td>101793</td>
<td>107927</td>
<td>82016</td>
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Table 2.4

**Yearly Exit Count Numbers**

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>Davis</td>
<td>1,583,120</td>
<td>1,050,286</td>
<td>989,475</td>
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</table>
**Figure 2.0**

Davis Library Exit Totals, July to June, 2001-2002
Figure 2.1

Davis Library Exit Totals, July to June, 2002-2003
Figure 2.2

Davis Library Exit Totals, July to June, 2003-2004
Figure 2.3

Davis Library Exit Totals, July to December, 2004
Figure 2.4

Davis Library Exit Totals, Yearly, 2001-2002 to 2003-2004


