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This study analyzes the usage patterns of the AOL Instant Messenger chat reference service provided by the R.B. House Undergraduate Library at the University of North Carolina at Chapel Hill for the first year of service (June 2003 to May 2004). Transcripts were examined to determine the types of questions asked and the number of questions per transaction. The Undergraduate Library's statistics were also examined to determine what months, days of the week, and hours the service was used most. The author makes recommendations to modify the staffing patterns on Sunday and during the evening shifts, and makes recommendations for further study that would guide the library in continuing to improve the service, as well as add to the literature on AOL Instant Messenger-type services.

Headings:

College and university libraries--Reference services

Electronic reference services

Reference services--Automation

Reference services--Evaluation

Reference services--North Carolina

WHAT ARE THEY ASKING AND WHEN ARE THEY ASKING IT? USAGE
PATTERNS OF AN AOL INSTANT MESSENGER CHAT REFERENCE SERVICE

by
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Introduction

Instant online communication, known as “chat” or “instant messaging” (IM) has become pervasive in the last few years and is widely used for social purposes and in business. In 1998 more than 63 million people had IM accounts and by the end of 2002 that number had risen to 174 million (Metz, Clyman & Todd, 2003). According to the Pew Internet report by Shiu and Lenhart (2004), 53 million American adults (42% of internet users in the U.S.) use instant messaging and 11 million (21%) of those users use instant messaging at work. Instant messaging has the greatest reach with Generation Y users, who make up the majority of undergraduate students. Since 1998, chat reference (also known as live online chat, digital reference, real-time online reference and virtual reference) has become an increasingly important means for librarians to reach out to new and existing user populations. Many libraries have offered such services with proprietary software such as tutor.com’s (formerly LSSI’s) Virtual Reference Toolkit, 24/7 or QuestionPoint. A few others have used free chat software such as America Online’s Instant Messenger service (AIM). Among these are SUNY Morrisville, SUNY Buffalo, and SUNY Plattsburgh (McKiernan, 2003). Much has been written about the implementation of and experiences with chat reference services; however, less has been done to explore in more detail the usage patterns of those services— for example, the questions patrons ask and the times of day, week, and semester that they ask them. This lack is especially acute for AIM-type chat reference services, since only two articles on such services were found during the literature review (see below). This study analyzes

the AIM chat reference service provided by the R.B. House Undergraduate Library at the University of North Carolina at Chapel Hill in order to discover what kinds of questions patrons are asking via the service, how many “top-level” questions they ask per transaction, and when they are asking those questions. The data resulting from this study will help the Undergraduate Library evaluate the service and determine what changes may be needed to improve it. It will also be a useful addition to the literature, because while other studies have investigated question-types and usage patterns, very few articles have been written about AIM-type services or services that are specifically targeted towards undergraduates.

Literature Review

A review of the literature revealed a number of libraries that have included data on question-types studies of their digital reference services. Some libraries used very broad categories of question-types while others used a greater number of narrower categories. Among the first group, Dunn and Morgan (2002/2003) at Cal Poly Pomona described their experience with 24/7 reference as part of a consortium comprised of public, academic, community college and special libraries. The authors report that about 50% of questions answered were “reference” questions, 20% were related to “library policies or technical problems”, and 16% were “known item or quick lookup questions”. Berry, Cassado, and Dixon also used a relatively simple group of categories for their study. The study sought to determine what kinds of questions patrons were asking to see if participating in a consortium was feasible (that is, were other libraries able to handle questions that might be local in nature?). Their categories were “policy/procedures, holdings, access, and factual”. In the introduction to his book on digital reference

(2002/2003), Katz also mentioned several categories, namely ready reference, directional, policy or procedural, and research type questions. Finally, Ciccone and VanScoy (2003) at North Carolina State University used the categories “Instruction”, “Known Item”, “About the Libraries”, “E-resources”, “Circulation”, and “Other” for a study looking at their service from January 2001 to June 2002.

Other libraries have used more categories to report the usage patterns for their services. Some of these were participants in consortia with a heavy concentration of public libraries. This is reflected in the categories chosen. For example, Kloss and Zhang’s study (2003) of the Northeastern Ohio Library Association Regional Library System’s AskUsQuestions.com service used many categories that would be useful for public libraries but not for academic libraries. These categories were “Homework Help:7-12”, “Ready Reference”, “Recreation/Entertainment”, “Personal Interest”, “Homework Help: K-6”, “Business”, “Consumer/Product Information”, “Do-it-yourself/How-to-do-it”, “Government”, “Health”, “Other”, “Hobbies”, “Research Assistance: undergraduate”, “economics”, “politics”, “legal”, “taxes”, “Research Assistance: graduate”, and “Research Assistance: doctoral”. Sweet, Lisa, and Colston’s study (2003) of Q and A NJ’s statewide service used five major categories: “facts”, “analysis/synthesis”, “opinions or advice”, “homework”, and “library-specific information”. Neither of these studies provides many categories useful for the purposes of the current study of an Undergraduate Library at a large university.

Other studies focus on academic libraries and provide more useful question-type categories. Powell and Bradigan (2001) did a study of an email reference service in a Health Sciences Library. The categories used for this study reflect the needs of a library

that is both academic and special in nature. The categories chosen were “library services”, “professional information”, “statistical information”, “database searching”, “access to online services”, “citation verification”, “consumer health”, “directory information”, and “holdings information”. Pappas and Seale (2003) did a study of the RefeXpress service at the University of Florida. Their study categorized questions into “What index to use?”, “ILL”, “Lost the Patron!”, “Referral”, “Full-text articles”, “Circulation”, “Other”, “Directional”, “Connection problems”, and “Reference”. Campbell, Jones, and Shuttle (2002/2003) at East Tennessee State University used the categories “specific topic or item request”, “general library information”, “access questions”, “help navigating website”, “connection lost” “renew materials request”, “other”, and “genealogy”. They also included data on the busiest hours of the day. At Penn State University, Ware, Fennewald, Moyo, and Probst (2002/2003, p. 24-25) did a study that used a question-type typology found in McClure and Lankes’ *Statistical measures and quality standards for assessing digital reference library services: guidelines and procedures* (2002). This typology uses the categories “bibliographic”, “instructional”, “literature search”, “other”, “out of scope”, “reader’s advisory”, “ready reference”, “research or subject request”, and “technical”. Of these, Ware et al. used five categories: “instructional”, “research or subject request”, “ready reference”, “technical”, and “out of scope”. Marsteller and Mizzy (2003) at Carnegie Mellon University, used different categories, called “directional/policy/procedure”, “known item”, “facts/ready reference”, “reference”, “technical problem”, and “librarian communication/training”. Finally, Broughton’s (2002/2003) study of the chat reference service at Bowling Green State University classified questions into 8 categories: “Articles on...”, “Known Item”,

“Patron Record”, “BGSU Information”, “Other”, “Other Librarians”, “Off-Campus Access”, and “Referrals”. This study also gave results for use by month and by day.

Some studies did not include question-type categories but did provide statistics on monthly, daily, or hourly usage. Luck (2003) at Austin Peay State University provided information on the busiest hours and days for the study. Witten (2003) also provided hourly and daily statistics.

While much information is available from studies on chat reference services in academic and public libraries, most of those services used vendor software such as the Virtual Reference Toolkit, 24/7, or QuestionPoint. A review of the literature revealed only two useful articles on AIM-based services. One of those is a case study of a service at SUNY Morrisville by Drew (2003). It describes why AIM was chosen as well as some initial impressions of the service. There are no statistics. Foley (2002) also wrote an article on an AIM chat reference service, describing a study of the one offered at SUNY Buffalo. This study included data on question types and usage patterns. The categories used were “Information Literacy”, “Catalog”, “Technical Troubleshooting”, “Web Navigation”, “Electronic Course Reserves”, and “UB Information”. The hourly statistics showed that the number of questions was greatest between 1pm and 5pm, which generally agrees with other studies that have reported hourly statistics. The busiest days were Sunday through Thursday.

Background

In May 2003, librarians at the University of North Carolina at Chapel Hill’s Undergraduate Library implemented a new chat service using America Online Instant Messenger (AIM). While Davis library (the main library) uses tutor.com’s Virtual

Reference Toolkit, the undergraduate librarians felt that their user population (which consists mainly of young adults aged 17-22) would be more interested in and more likely to use a service based on a software they already use. Librarians informally surveyed undergraduates and asked them whether they used instant messenger services and which ones they used. The majority mentioned AIM. Librarians also observed students using the service from computers in the library. This is similar to the rationale that led SUNY Morrisville to implement their AIM reference service (Drew, 2003).

Many undergraduates use AIM for daily social interaction. While AIM generally requires a download, many of the Undergraduate Library's users already have the software on their computer, and there is an option called AIM Express that allows users to use the service from the AOL web site rather than downloading the traditional AIM software. Librarians decided that since an AIM service was likely to appeal to undergraduates and because the software is free, it was worth a trial run. The service was implemented during late May 2003 and was made available during the hours the Reference Desk was open. During the Summer Sessions, the Reference Desk is open from 9am-9pm Monday through Thursday, 9am to 4pm Friday and 5pm to 10pm on Sunday. During the Fall and Spring semesters, the Reference Desk is open from 9am to 10pm Monday through Friday, and 1pm to 10pm Sunday. It is closed on Saturday. Librarians and Library Science graduate students answer chat questions at the Reference Desk. There are normally two librarians on duty at one time, so if the volume of chat and face to face questions is high they can divide the duties.

In the year and a half since its inception, the service has proved to be popular. Usage statistics have increased steadily within the usual ebbs and flows of each semester.

Patrons frequently thank the librarians for their assistance, saying they found what they needed or that “you saved my life!”. The service continues to be offered with librarians staffing it from the Reference Desk. Each IM transcript is saved in a folder by month. Transcripts are kept confidential and are only used internally by the library for training and evaluation purposes. Transcripts are kept on a secure library network drive for one year and then stored on a CD and removed from the drive. The CD records will be kept for four years following removal from the library network drive. In addition to saving each transcript, the librarian marks a category on a statistics sheet and the one-hour time period in which it occurred. During the period of the study, those categories were “reference” and “directional”. These are nearly the same categories as those used for face to face reference, with the omission of copier/teller and technical questions. That is not to say that technical or copier related questions were not received via the AIM service. As a result of this study, further categories have since been added to the statistics collection for both face to face and chat reference. This will be discussed below.

While time of day and reference/directional information is useful, the statistics reflected only the number of IM transactions that occurred, not the actual number of questions asked (since there might be more than one question per transcript). In addition, the hourly and daily data had not been analyzed until the beginning of this study and the use of only two question-type categories does not provide enough detail to effectively evaluate the service. For example, any number of question-types might fall under the heading “reference”. Under this system, in-depth research questions, quick factual questions, questions related to library policies, citation questions, and known item questions would all be labeled reference. This poses a problem because it makes it

difficult for librarians to know whether more resources need to be added to the web site, what changes might need to be made to library instruction classes, or what resources librarians should compile into a quick reference cheat sheet to help answer chat questions. For example, a high number of questions demonstrating confusion about using the article databases or the difference between scholarly and popular sources might indicate a need to change current “how do I” guides and to place more emphasis on these areas in library instruction. In order to truly understand what the patrons need and to respond appropriately, it is necessary to know more precisely what kinds of questions they are asking.

Methodology

This study sought to answer three main questions: what kinds of questions are patrons using the AIM service to ask, how many questions are asked in each transaction, and when are they asking those questions? The study covered the first year of the service—from June 1, 2003 to May 31, 2004. Since this was the first study analyzing this service, the statistics provided are mainly descriptive, with the goal of using the results to improve or adjust the service as necessary. It should also provide a basis for comparison for future studies.

Question-Types

In order to answer the first research question, the transcripts for June 2003 through May 2004 were examined with the assistance of content analysis software to determine what types of questions patrons asked. The entire population of 1934 transcripts was used for the study. The transcripts were given numbers from 1 to 1939 in chronological order (see “Limitations” below for an explanation of the discrepancy in

numbers). All transcripts were coded in the order provided by a random number generator. The coding was done by the author and another reference librarian at the Undergraduate Library.

The questions were classified using 17 different categories of question-types. These categories and their definitions are listed in Appendix A. The categories were chosen by reviewing the literature for categories used in previous studies. The author then informally interviewed librarians at the Undergraduate Library to solicit feedback and determine which categories would be most useful for local purposes. It is difficult to categorize chat reference transcripts into only one category and sometimes a best judgment must be used. To help make this judgment easier and the results more complete, the code book rules allowed each transcript to have more than one “top-level” question. While in practice the main unit of the IM transaction is the entire transcript, the main unit for this study is the “question” as defined by the code book in Appendix A. This means that each top-level question was coded individually, even if it meant that there was more than one question per transcript.

Within a single transaction, a new question can occur as a result in a shift of topics, a major follow-up question, or a problem encountered during the discussion. For example, a patron might ask for help researching a topic. During the course of the discussion, the patron might encounter a problem with the proxy server and ask for help with that problem. The initial question would be coded as a “Finding articles/subject-based research” question, while the second question would be coded as an “Off-campus access/proxy server” question. In this situation a minor follow-up question clarifying search terms for the research does not count as another top-level question. Another

possible situation is that the patron has two research topics for two different classes. The patron might ask for help with one topic and then request assistance finding materials for the second topic. This transcript would be coded with two “Finding articles...” questions. This practice of coding more than one question per transcript if necessary allowed more accurate coding of the contents of an IM transaction.

Before the actual coding for the study was done, two pretests were conducted to determine the inter-coder reliability of the classification terms defined in the code book. For each pretest, two undergraduate reference librarians and two SILS students or library staff members who do not work at the Reference Desk were given copies of ten anonymized IM transcripts. Each pretest used a different set of transcripts. Coders were also given a copy of the most recent version of the code book. The author and the testers used the code book to classify the ten transcripts into categories and indicated the number of questions contained in the transcript (to check the definition of “question”). The pretests revealed that while the basic categories made sense, there was some confusion over the definitions. For example, some coders counted related questions as separate ones or only counted one question even though there was another question in the transcript. The definition of “question” in the code book was revised to clarify the requirements for a question to qualify as a top-level question. In addition, the definition of “Out of scope/referral” questions left some coders confused as to whether a question would be coded in only this category or whether it would also be marked in another category that fit. It was also not clear that these questions should be “Finding articles/subject-based research” type questions and not technical questions that were

referred to technology services. The definition of the “Out of scope/referral” category was accordingly revised to make it clearer.

Questions per Transcript

The second part of the study examined the number of questions asked by patrons in each transaction. In order to collect this data, the individual document reports from the content analysis were examined to determine the number of questions coded in each transcript. Since the content analysis software used did not allow for the generation of an automatic report of these data, the numbers for each transcript were manually recorded and entered into a table to show how many transcripts had 1 question, how many had 2, and so on. This table is provided in Appendix C.

Temporal Usage Patterns

Finally, in order to discover when patrons were using the service--that is, what hours, days and months were busiest—the author examined the data collected from the statistics recorded at the desk. Those statistics entered at the end of the day into a Microsoft Access database. To retrieve the data needed for the study, the author created reports on the number of questions per day of the week or hour of the day. These statistics were arranged to show the entire year by month, and each semester and month by day of the week and hour of the day. The author then graphed the data to obtain a visual representation that made it easy to see patterns of usage for the service.

Limitations

There are several possible sources of error in this study. As stated above, the study used the entire population of the first year of service. The population consists of 1934 IM transcripts. There were originally 1939 transcripts, but 5 were eventually

eliminated because they were discovered to be duplicates. This duplication occurred when a transcript was accidentally saved twice or when the librarian inadvertently saved the transcript before the transaction was finished, and then saved the rest of the conversation later. If the second transcript contained a new top-level question it was coded. If the second transcript was wholly a duplicate or did not contain a new question it was eliminated. These duplicates were discovered during coding when the coders noticed that the transcript appeared to be a continuation of a previous transcript or that they had already coded that transcript. The transcripts from that day were double checked to discover if this was indeed the case, and if so, the duplicate was deleted. It is possible that some duplicates were not detected, but this should be a small number.

In addition, the study was affected by the fact that librarians occasionally forgot to save an IM or mark a chat reference transaction on the statistics sheet. This means that some transactions may not be included in the data. In terms of the content analysis, this is most likely to affect the Librarian Communications category and possibly the Wrong Buddy/Random Greeting category, since internal communications or messages that said “hello” and nothing else often did not get saved. The part of the study that is likely to have been most affected by this phenomenon is the daily and hourly statistics. At the beginning of the service it took librarians some time to get used to saving the transcripts, and when the desk gets busy librarians sometimes forget to mark down statistics. This is reflected by the fact that 1939 transcripts were saved but only 1823 transactions were recorded in the statistics.

Finally, the results for the part of the study examining the number of questions per transcript were affected by differences in data collection methods for each section of the

study and errors made by the researcher. The sum of the number of questions counted in the categories during the content analysis part of the study indicates that patrons asked 2416 questions; however the number of questions as calculated from data collected during the analysis of the number of questions per transcript indicated that patrons asked 2161 questions. This is due to the fact that data for this section of the study were collected manually, and some transcripts with multiple questions may have been missed. The results for this section should still be reasonably valid, since the difference between the number of transcripts with one question and the number of transcripts with two questions was so large.

Results

Question-Types

The results for the question-type section of the study are detailed in Appendix B. Note that for this section, the figure for the total number of questions asked is 2416. Analysis of the 1934 transcripts reviewed during the content analysis part of the study revealed that most questions asked by patrons during the study period were related to Finding Articles/Subject-Based Research (668 questions / 28%), Library Information (551 / 23%), or Known Item/Holdings (388 / 16%). The next highest group was questions on Technical Problems/Network (136 / 6%), the Media Resources Center (132 / 5%), and Citation (130 / 5%). The other question-type categories had much lower numbers. Those data are available in Appendix B, Table 1.

Questions per Transcript

Of the 1934 transcripts, 1735 (90%) contained one question as defined by the code book. 180 (9%) had two questions, 12 transcripts had three (.6%), 3 transcripts had

four (.2%), 1 transcript had five (.05%), and 1 transcript had seven (.05%). This amounted to a total of 2161 questions distributed among the 1934 transcripts, or an average of about 1.1 questions per transaction. See Appendix C, Table 2 for details.

Temporal Usage Patterns

The final part of the study focused on the daily and hourly statistics collected at the desk and later entered into the Microsoft Access database. These statistics were analyzed to discover patterns in the usage of the service over the year, each semester, and each month by day of the week and hour of service. The total number of questions used for this part of the study is 1823, as provided by the database. Figure 1 in Appendix D shows the overall trends from June 2003 to May 2004. During the summer, the service received only about 20 questions per month. Then in September there was a sharp increase, as staff answered 141 questions. The numbers kept increasing until they hit a peak in November, with 384 questions. The numbers dropped again to 139 questions in December, then increased again as the Spring 2004 semester progressed, peaking in April at 271 questions. The implications of this pattern will be discussed in the next section.

Analysis of the data for usage by day of the week over the year, by semester, and by month showed fairly consistent overall results, with slight variations on a month by month basis (See Appendix E, Figures 2-17). Overall, the busiest day of the week for the entire period studied was Monday (409 questions / 22%). Tuesday (368 / 20%), Sunday (332 / 18%), and Wednesday (330 / 18%) were also busy. Thursday and Friday lagged further behind at 297 questions / 16% and 87 questions/ 5%, respectively.

During Summer 2003, Wednesday, Tuesday, and Monday were busiest, in that order. During Fall 2003, Sunday was busiest, followed by Tuesday and Monday..

During Spring 2004, more questions were asked on Monday, followed by Wednesday and Tuesday.

Compared to the graphs for the year and semesters (Appendix E, Figures 1-4), the monthly data (Appendix E, Figures 5-17) show more variation. During the Summer, the most questions were asked on Tuesday in June, Wednesday in July, and Thursday in August. The monthly patterns for the Fall semester were more consistent than those of the summer. In September, most questions were asked on Monday, in October on Tuesday, in November on Sunday, and in December on Monday. So for the Fall as a whole Sunday through Tuesday was the busiest period. During the Spring semester, there was a strong pattern of Monday usage, and the busy section of the week shifted slightly to Monday through Wednesday, instead of Sunday through Tuesday. In January, the busiest day was Wednesday, in February it was Monday, in March Monday, in April Monday, and in May Tuesday.

Like the data for the usage patterns by day of the week, the data for hour of service show consistent patterns, although the Summer usage was more erratic and there was some variation by month. For the entire study period of June 2003 through May 2004 (see Appendix F, Figures 18-32), 3pm-5pm and 9pm-10pm were the busiest times of day. During the Summer, most questions were asked between 7pm and 8pm, with lesser peaks from 1pm-2pm, 3pm-4pm, and 6pm-7pm. During the Fall semester, the busiest times were 3pm-5pm and 9pm-10pm. In the Spring semester, the peak periods of use were from 2pm-5pm and 8pm to 10pm. This shows an overall pattern of heavy use during the mid to late afternoon and again in the evening.

A month by month analysis of the patterns of use during the hours of service shows clearer peaks in the midst of lower numbers for the rest of the day. For example, in June and July 2003, the busiest period was from 7pm to 8pm, while in August it shifted from 6pm to 7pm. There were gaps in the morning and afternoon where no questions were asked.

In September, usage began to settle into a regular pattern with the return of the full academic schedule. Highest usage was from 2pm to 5pm, with a smaller surge from 9pm to 10pm. In October, usage peaked from 4pm to 5pm, dropped and then rose again from 7pm to 9pm. In November, usage was more spread out during the day, with 3pm to 4pm, 7pm to 8pm, and 9pm to 10pm being the busiest hours. During December, the last month of the fall semester, 4pm to 5pm was again busy, with a peak from 9pm to 10pm.

Usage patterns for the Spring 2004 semester by month show a shift to more usage earlier in the day. While the peak time of use during the Fall semester tended to be from 9pm to 10pm, the peaks for the Spring semester were more likely to occur in the middle of the day. In January, the highest number of questions was asked from 2pm to 3pm, with a smaller surge from 8pm to 9pm. In February, it was busy from 2pm to 3pm, 4pm to 6pm, and 9pm to 10pm, but the most questions were asked during the 4pm-5pm slot instead of the 9pm to 10pm. In March, the busiest period by far was again 9pm to 10pm. The April pattern was similar to the February pattern, with peaks from 3pm to 5pm and 8pm to 10pm. Finally, in May there was a marked shift in the pattern from the later afternoon and evening hours to the early afternoon. The busiest period was from 12pm to 1pm, with a smaller peak from 3pm to 4pm. The numbers steadily dropped off after 4pm.

Discussion

Question-Types

The results for the question-type section of the study were consistent with Undergraduate librarians' experience and expectations. Most of the questions answered by librarians fall into the Finding Articles/Subject-Based Research category, followed by Library Information, Known Item/Holdings and Technical Problems/Network. While librarians do not collect data on patrons' status, we know that most of our users are undergraduates in the English Composition program who are working on unit projects for their courses. Librarians encourage students in their instruction sessions to ask librarians for help if they are having trouble doing the research for their unit projects, and nearly always mention the AIM service. As a result, many of our Finding Articles and Known Item questions come from this group of users. Since these students are new to library research, they need help choosing which database to search and finding good search terms, both of which fall under the Finding Articles category. They often also need help finding the full text of an article when the particular database they are using does not have full text.

Questions per Transcript

As shown by the data, most transcripts (1735 or 90%) had only one top-level question as defined by the code book. Only 180 transcripts (9%) had two questions, and there were even fewer transcripts with more than two questions. This seems to indicate that most users focus on one major issue in each transaction. The author and the librarian who assisted with coding were surprised that so few transcripts had more than one question. During a transaction, it feels like more questions are asked, but this is because

most of those questions are paraphrases of the original question or minor follow-up or clarification questions and not top-level questions as defined for this study. For example, a student might ask for help doing research on a particular topic. The librarian would then conduct a reference interview and recommend a database and search terms. The student would often ask questions about the search terms or about using the database, or might ask a general question about how to find the full text if it is not directly available in that database. Even though many questions, comments, and clarification statements are exchanged in this process, only the initial research question in this scenario actually qualifies as a question for this study. The author cannot draw any major conclusions on this subject at this time, but the number of questions asked per transaction and the length of transactions warrants further study.

Temporal Usage Patterns

For the entire study period, the results clearly show that the busiest months are November and April, which are the last full months in the Fall and Spring semesters, respectively. While the author has no data regarding the due dates of assignments during the semester, it is logical to conclude that there are more questions at this time of semester as more assignments are due and students need extra help. The number of questions is lower during months where fewer assignments are due or where there are breaks from classes. The April peak (271 questions) is much lower than the November peak (384 questions). There are a number of possible reasons for this. One is that, based on experience, most questions are asked by freshmen and sophomores. It is possible that as the year progresses and these students learn more about doing research, they need less assistance from librarians. There are also fewer English Composition classes offered

during the Spring semester, and since this is a large part of our patron base, this affects the number of questions we receive. Finally, while the author has no official data on the subject, more students tend to study abroad in the Spring semester. This may also have an influence on the number of questions asked during the Spring.

Results from the analysis of daily and hourly usage patterns show that Sunday through Tuesday tends to be the busiest part of the week. The fewest questions are asked on Fridays, which is predictable given that students tend not to do as much work at the beginning of the weekend. They do much of their work starting Sunday and continue to ask questions during the first half of the week as they prepare to turn in assignments throughout the week. The hourly data show that the busiest times of day are mid-afternoon from about 3pm to 5pm and again in the evening from 9pm to 10pm.

Anecdotal evidence from the Fall 2004 semester indicates that more questions are being asked during the 9pm to 10pm hour and that more questions are being received just as the service is closing. One of the problems with this is that one person, who has to field both face to face and chat reference questions, generally staffs the desk at night (from 5pm to 10pm). Since the service is staffed from the desk (rather than from home, for example) and the librarian needs to leave at 10pm, last-minute questions pose a quandary since the librarian needs to shut down the desk but may feel reluctant to turn away patrons. This information, along with the data for the study period, indicates that changes may need to be made to the hours of service and the staffing model.

Recommendations and Conclusion

The results indicated that students are using the AIM service to ask the types of questions the author anticipated. The question-type section of the study did not reveal

any specific changes that might need to be made in the service. In the future, it might be useful to conduct an in-depth study of some question-types in a smaller sample to see if the questions ask reveal information needs that could better be met by instruction librarians and web guides or pathfinders. Anecdotal evidence from the Fall 2004 semester indicates that more questions are being asked on how to cite sources. It may be useful to look at the statistics for this semester to determine whether that is true, and if so, more attention should be paid to citation in instruction classes. It is also possible that the citation tutorials on the library web site may need revision. A longitudinal data analysis would be useful to reveal how question-types change over time and provide indicators for when reference services need to be adjusted accordingly.

There was not time for the author to investigate the number of questions per transcript in any depth. It would be interesting to examine transcripts in the future to determine how transcripts with multiple questions are different. Are the patrons asking different kinds of questions than in the single question transactions? Is the way the reference interview is conducted or the quality of the interaction different in these transactions? In addition, it would be interesting to examine how long transactions take and how this might relate to the question type category or the number of questions per transcript. The results of such a study would reveal if further changes or adjustments are needed to improve the chat service.

The temporal usage patterns revealed by this study provide the most useful data for indicating the need for changes to the service. Given that the results show that Sundays are busy, and that the hours of 3pm to 5pm and 9pm to 10pm are busy, the library may need to consider shifting staffing patterns. On Sunday, only one person staffs

the desk (and the AIM service) for each shift. This is also true for the 5pm to 10pm shift throughout the week. As mentioned earlier, anecdotal evidence indicates an increase in the number of questions in general and particularly in the evenings around 10pm. If money and staff resources permit, the library should consider adding an extra staff member for Sunday and evening shifts or extending the hours of the service, at least during the busiest months of November and April. This could be done by creating a backup system where one person continues to staff the desk while another librarian is available via AIM from home. If the person at the desk receives too many questions, the desk librarian could contact the backup librarian and have that person take the extra questions. After 10pm, online help is still available via Davis Library's Night Owl service; however, this service does not use AIM, which many undergraduates seem to prefer. If it is feasible, it may be useful to extend the hours of the Undergraduate Library's service to 10:30 or 11pm, at least during the busiest months.

The author suggests that it would also be useful to analyze the demographics of the patrons using the service. The patrons seem to be mostly freshman and sophomore undergraduates but no numbers are available since patrons can connect directly with the service without filling out a form. A survey type instrument could be used to determine who is using the service when. If possible, it would be good to compare who is using the AIM service versus who is using Davis Library's vendor-based service.

This study looked at the types of questions patrons are using the Undergraduate Library's AIM service to ask and when they are using the service. While this study contributes to the literature on chat reference usage patterns and AIM-type services, more research needs to be done to assess undergraduates' use of such services and the

differences in the demographics and usage patterns of AIM-type and vendor-type chat services.

Appendices

Appendix A – Question-Type Code Book

A. Questions

QUESTION

A question is a statement or communication from an IM patron that expresses an information need (asks the chat librarian for help on some topic). For the purpose of this study, questions will be defined as each top-level expression of an information need. For example, the patron will ask a question about searching for articles on a topic. Then the patron and the chat librarian may negotiate the question (ask each other questions or exchange information) so that each party understands what is needed and the question can be answered. If at the end of this discussion the patron makes a new statement of information need, such as the hours of the library, this communication would be classified as a new question. A new question may be of the same question-type as the first but will generally request information on a different topic. Questions may or may not be phrased as questions.

- Ex. What time does the library close?
 I need to find an article on the No Child Left Behind act.

B. Categories

LIBRARY INFORMATION (LIBINFO)

Questions asking for general information about the library (as well as other UNC-CH branch libraries), including questions about circulation, policies and procedures, the building, and hours.

- Ex. What time does the library close?
 I want to reserve a study room, how do I do that?
 How long can I check a book out for?

MEDIA RESOURCES CENTER (MRC)

Questions about the MRC, which is located in the Undergraduate Library and lends out and reserves films, provides viewing stations, and houses a digital audio and video editing lab. This category is similar to the Library Information category but is specific to the MRC.

- Ex. How long can I borrow movies for? (MRC videos only)
 How do I use the Film Finder?
 When does the MRC close?

FINDING ARTICLES/SUBJECT-BASED RESEARCH (RESEARCH)

Questions on how/where to find articles or other materials on a specific topic.

- Ex. I need to do a paper on Jane Austen's *Persuasion*. Where do I find articles or books on this topic?

I need to find articles or information discussing both sides of the abortion issue.

I need to find information on cystic fibrosis.

CAMPUS INFORMATION (CAMPUS)

Questions related to the UNC-Chapel Hill campus or academic programs.

- Ex. How do I contact the Scholarships & Student Aid office?
Where can I find a copy of the Undergraduate Bulletin?
When does registration close?

OUT OF SCOPE/REFERRAL (REFER)

Research questions that cannot be answered by the chat librarian that are referred elsewhere. A referral question will be marked only in this category and not in any other category which it might fit into.

KNOWN ITEMS/HOLDINGS (KNOWN)

Questions on whether items are available or locating specific articles. This includes Interlibrary Loan materials. Questions asking where a specific call number is go in the DIRECTIONAL category.

- Ex. Do you have a copy of the text book for Econ 10?
I'm looking for the article "14 States Ask U.S. to Revise Some Education Law Rules" from the NY Times. Is it available online?

RESERVES (RESERVES)

Questions about electronic or paper reserves.

- Ex. My professor said there is an article on reserve that we are supposed to read. How do I find it?

CITATION (CITE)

Questions on how to cite sources.

- Ex. How do I cite web pages using MLA?
My professor wants me to use CBE style for a paper. How do I do that?

INCOMPLETE (INCOMP)

Questions or communications that are not answered or finished due to disconnection, patron away message, patron changing their mind, or other similar reasons.

INAPPROPRIATE (INAPP)

Communications of a harassing, completely out of scope, or otherwise inappropriate nature. This includes off-color/obscene communications, patrons who warn the chat librarian, patrons who make up nonsensical questions just to have fun, and other similar situations.

WRONG BUDDY/RANDOM GREETING (RANDOM)

Communications where users accidentally IM the chat librarian or people who simply say hello and do not continue the conversation much further or do not otherwise harass the chat librarian.

TECHNICAL PROBLEMS/NETWORK (TECHNET)

Questions related to problems with databases, using software, fixing computers, and network problems. This category does not include questions about off-campus access or the proxy server, as that question is given its own category (below).

- Ex. I'm trying to use Lexis-Nexis but it's not working. (student is on-campus)
How do I do footnotes in MS Word?
My wireless connection is not working.

OFF-CAMPUS ACCESS/PROXY SERVER (PROXY)

Questions related to how to access databases from off-campus and how to use the library's proxy server.

- Ex. I'm trying to access Academic Search Elite from off-campus and I keep getting a log in request.
How do I configure my browser for the proxy server?

DIRECTIONAL (DIRECT)

Questions asking for directions to buildings, offices, call numbers, etc.

- Ex. Where is Fetzer Gym?
Where do I find a UL book with the call number PR2831.A2 W54?
In what building is the Classics Department located?

QUESTIONS ABOUT THE IM SERVICE (SERVICE)

Questions from patrons and other librarians about the AOL IM service.

LIBRARIAN COMMUNICATIONS (LIBCOM)

Communications between Undergraduate librarians or other UNC-CH librarians regarding shift schedules, events, or other staff issues.

OTHER (OTHER)

Questions or communications that do not fit in any of the other categories.

Appendix B – Question-Type Results

Category	Number of Questions
Finding Articles/Subject-Based Research	668
Library Information	551
Known Item/Holdings	388
Technical Problems/Network	136
Media Resources Center	132
Citation	130
Other	79
Incomplete	58
Campus Information	52
Wrong Buddy/Random Greeting	43
Directional	39
Off-Campus Access/Proxy Server	34
Inappropriate	31
Reserves	29
Out of Scope/Referral	22
Questions about the IM Service	20
Librarian Communications	4
Total	2416

Table 1.

Appendix C – Questions per Transcript

Number of Questions per Transcript	Number of Transcripts	Number of Questions
1	1735	1735
2	180	360
3	14	42
4	3	12
5	1	5
6	0	0
7	1	7
Total	1934	2161

Table 2.

Appendix D – Overall Usage by Month

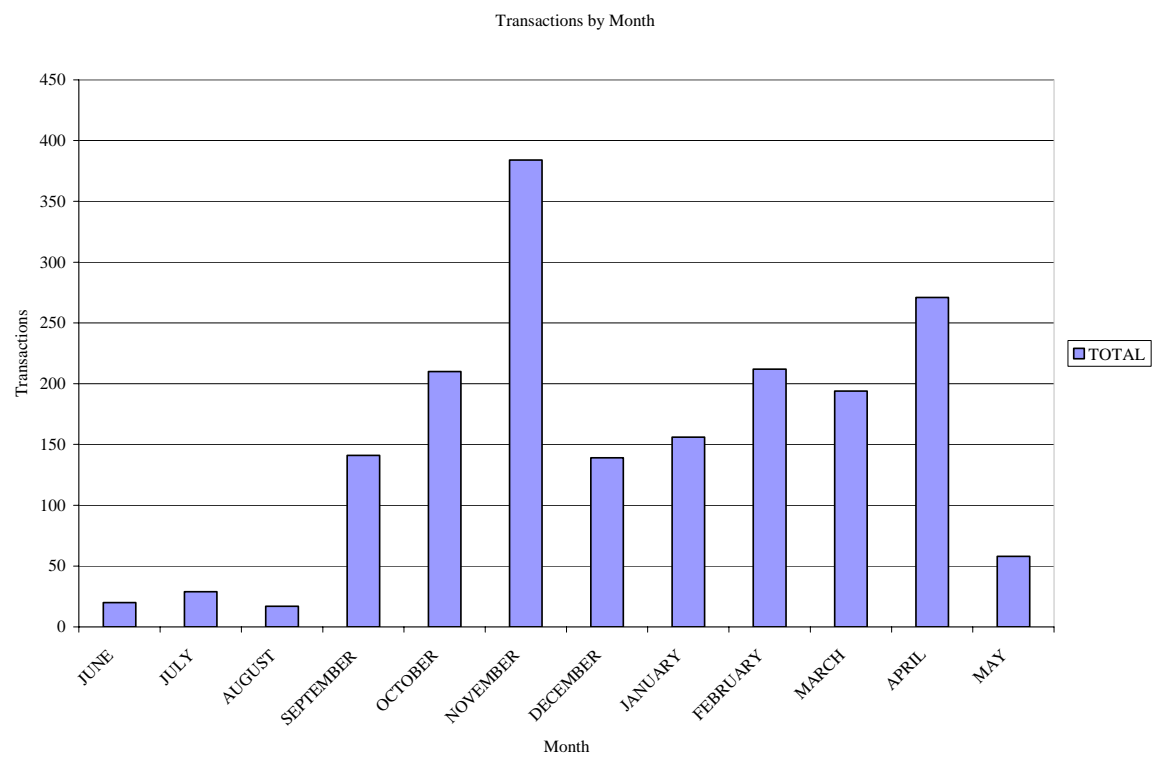


Figure 1.

Appendix E – Usage by Day of the Week

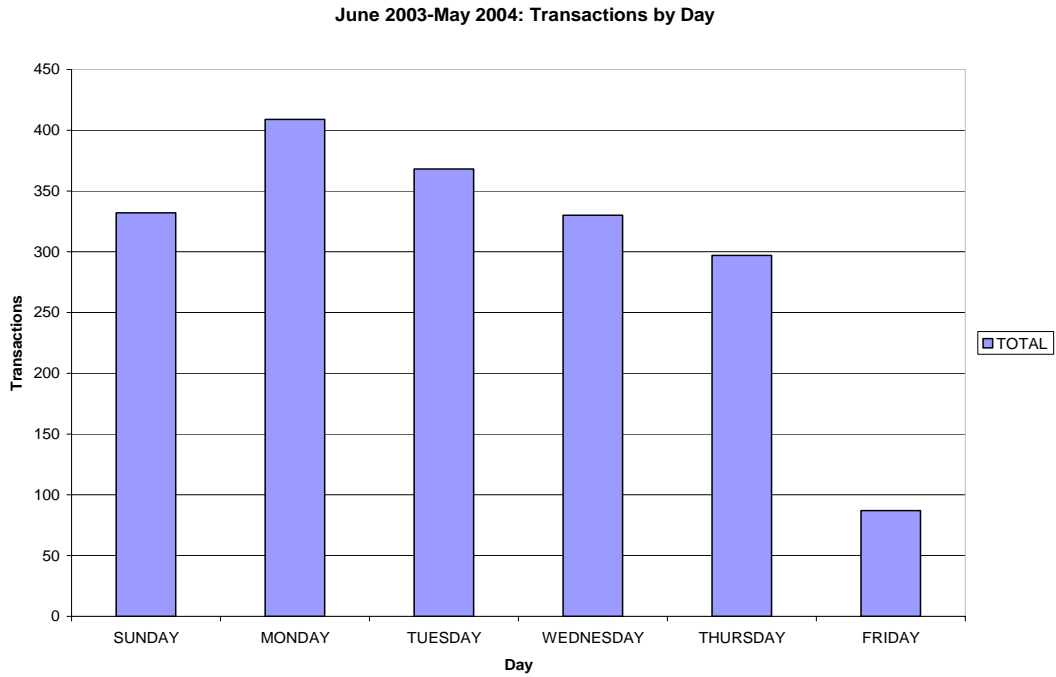


Figure 2.

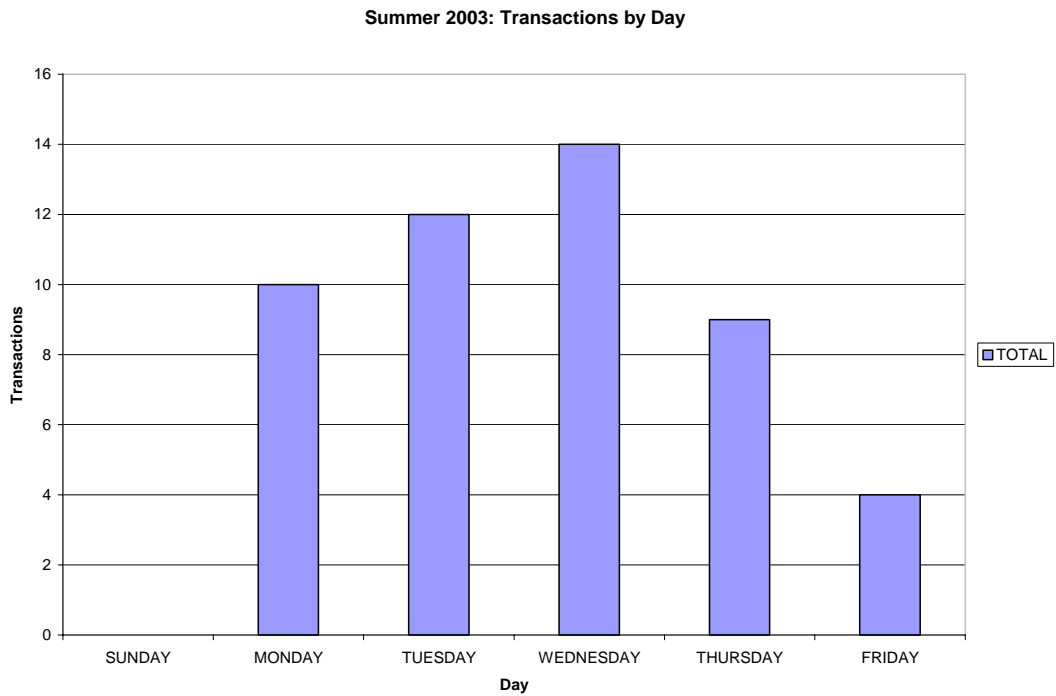


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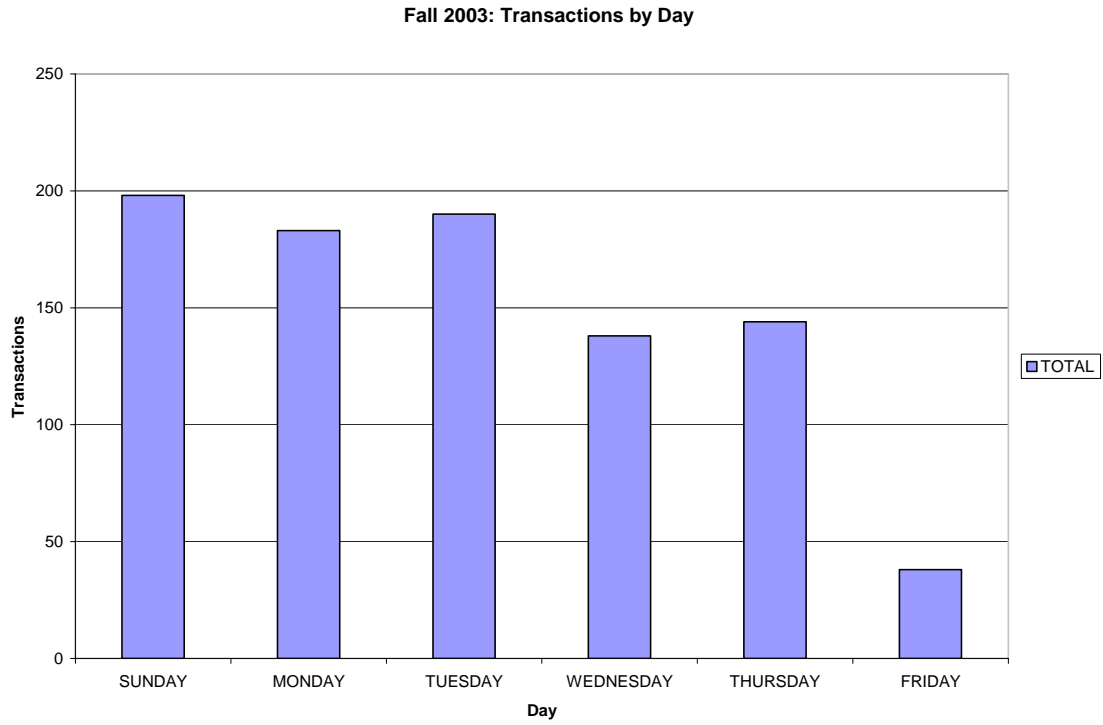


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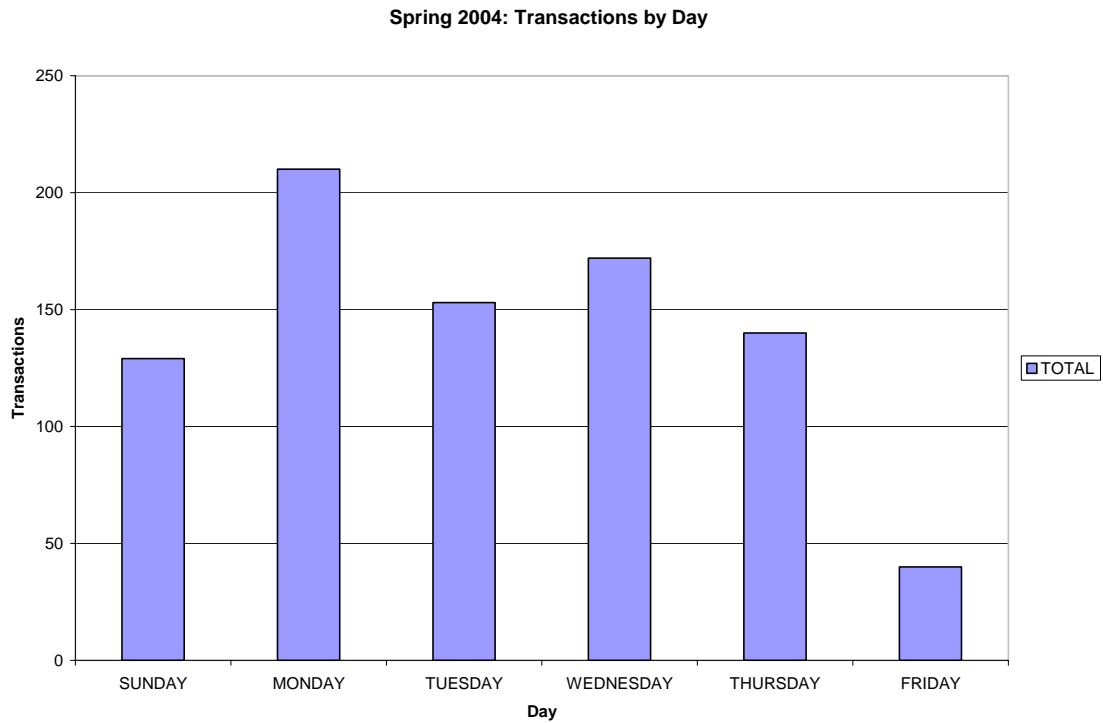


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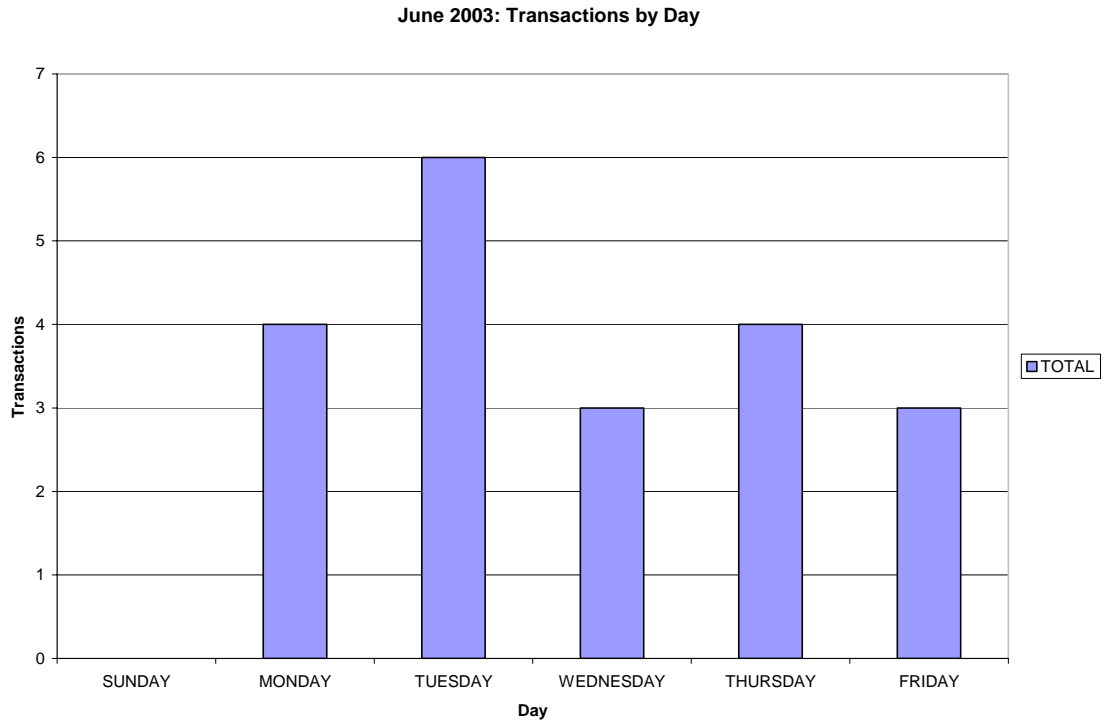


Figure 6.

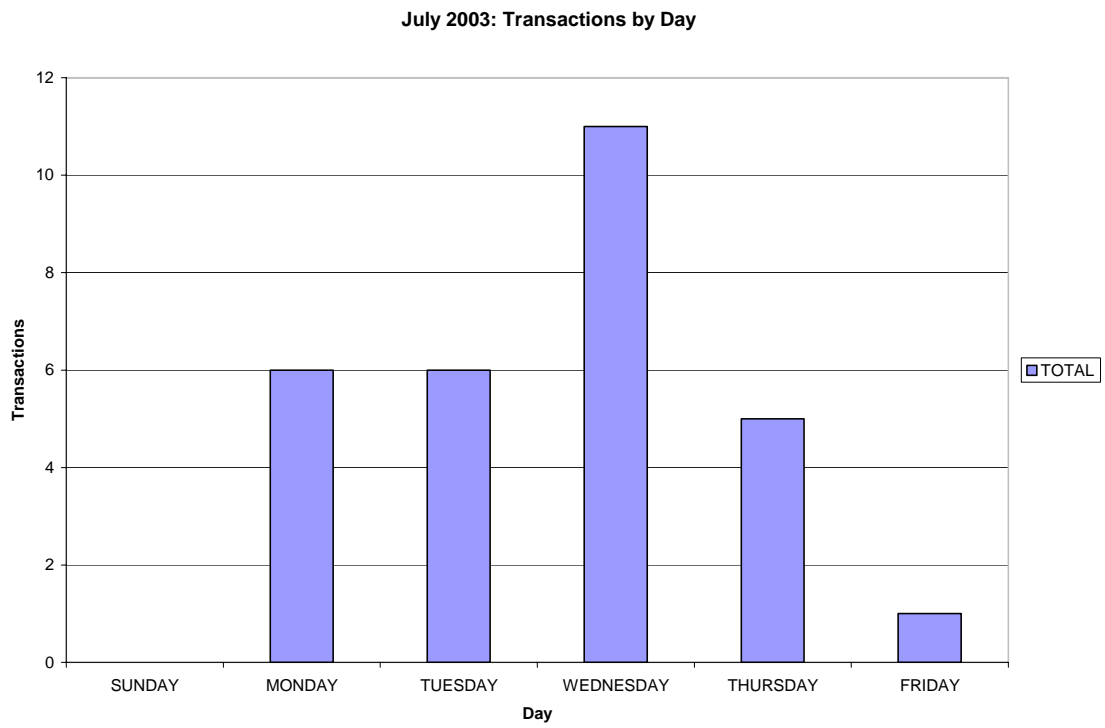


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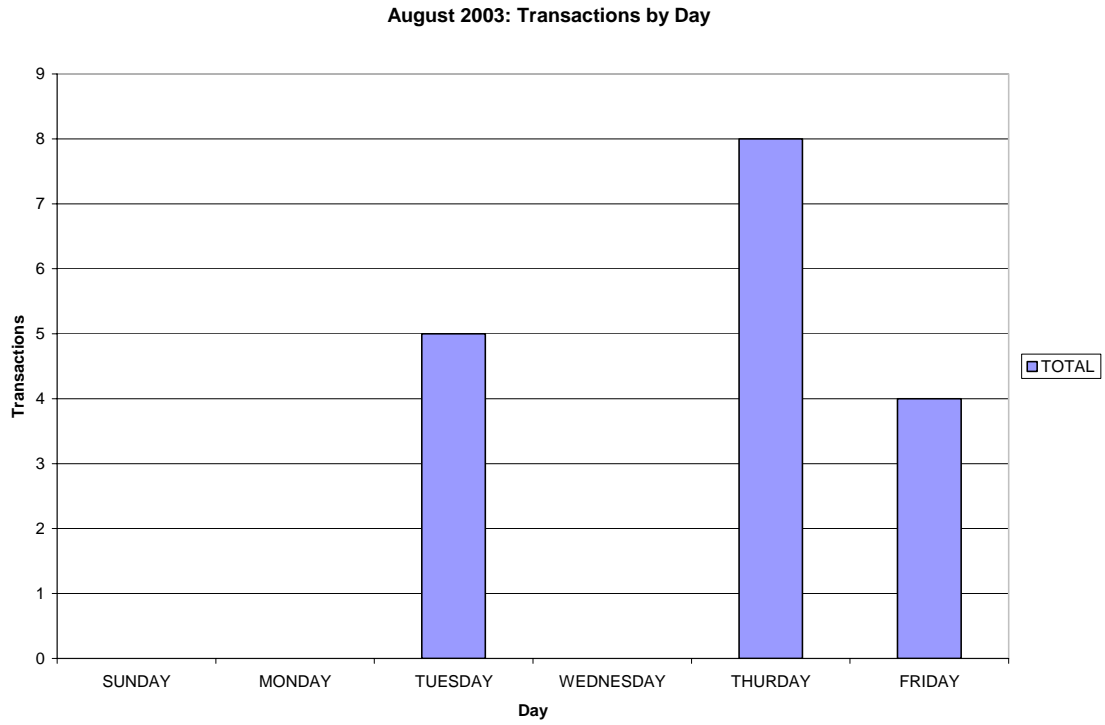


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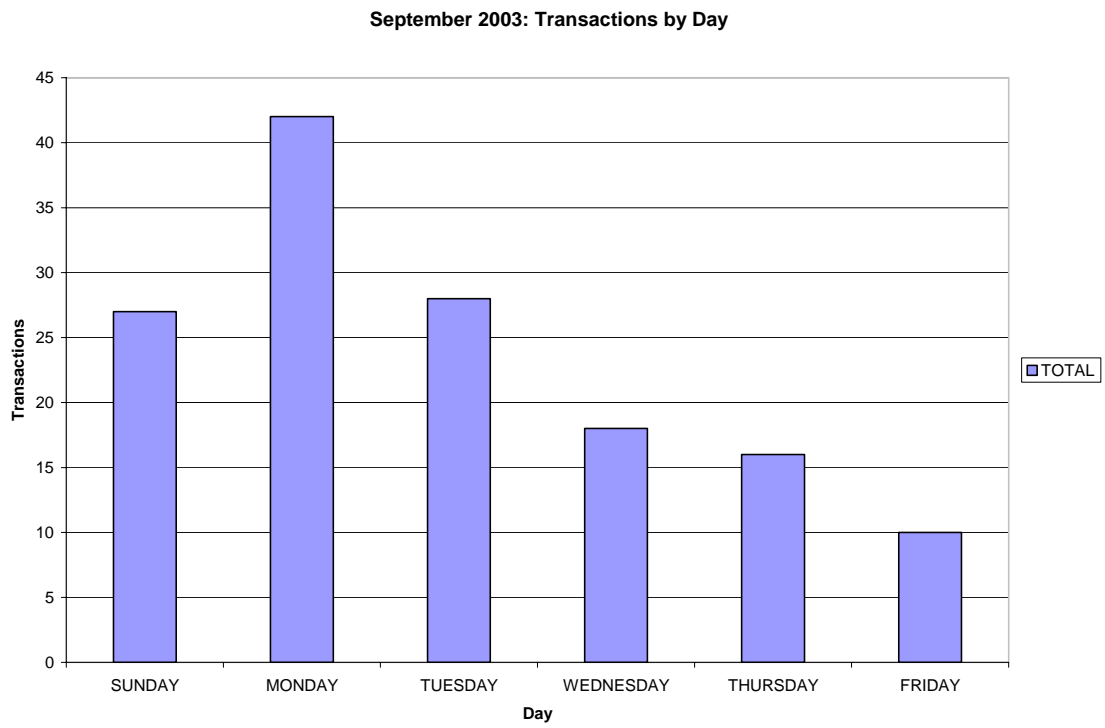


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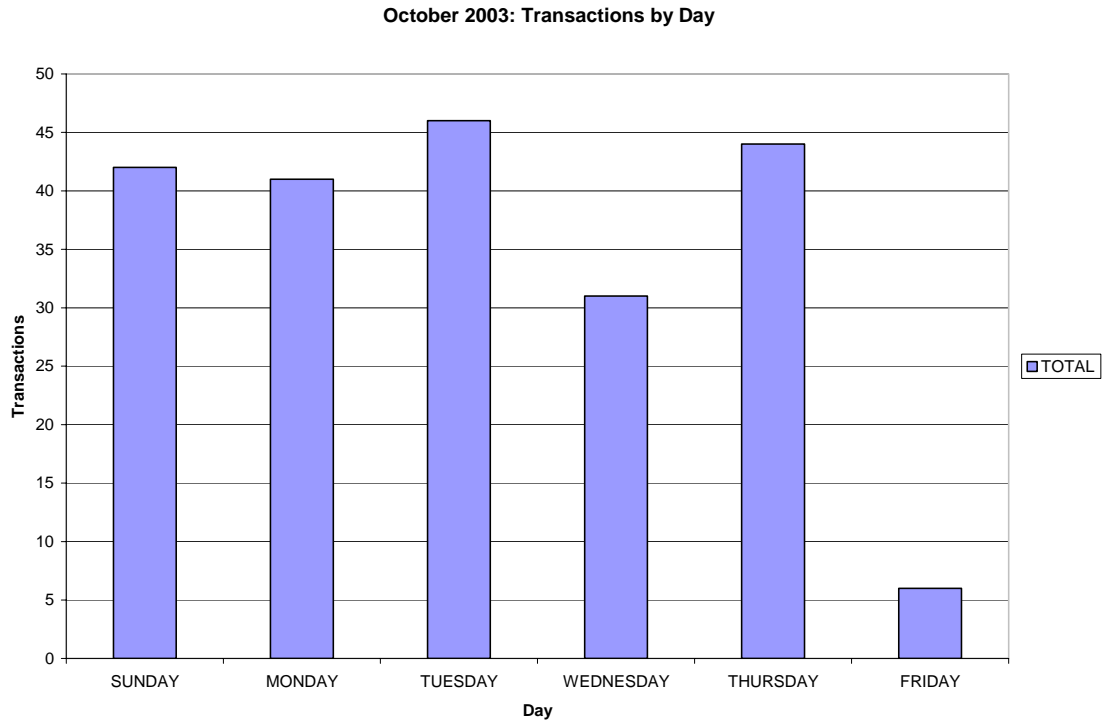


Figure 10.

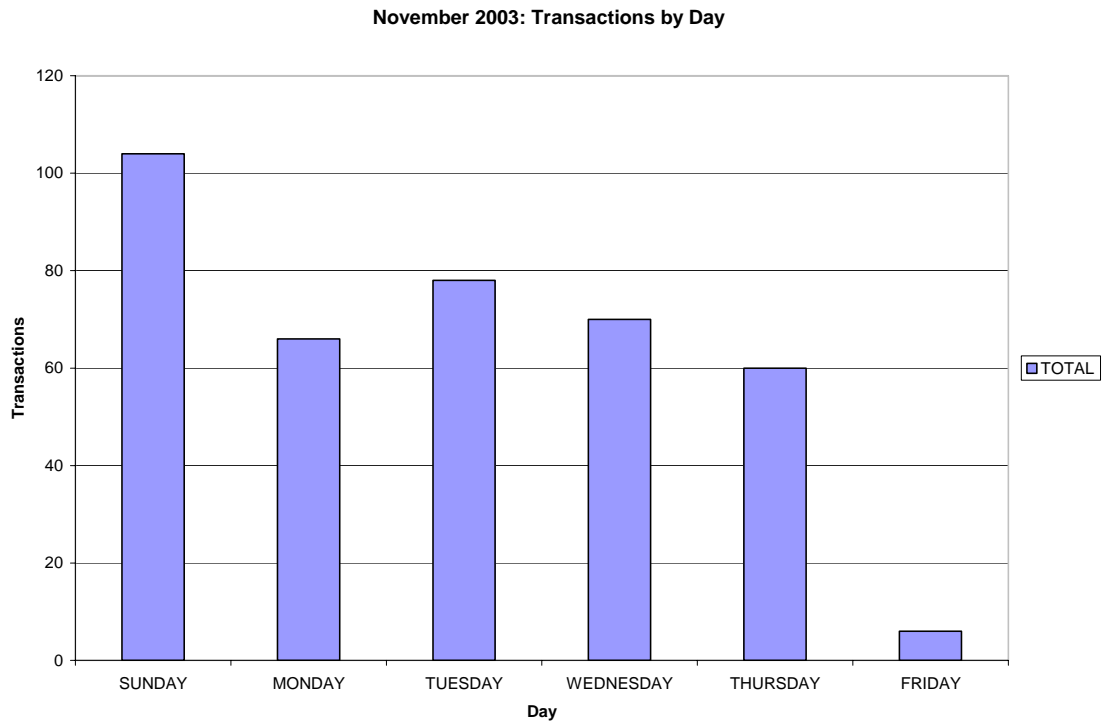


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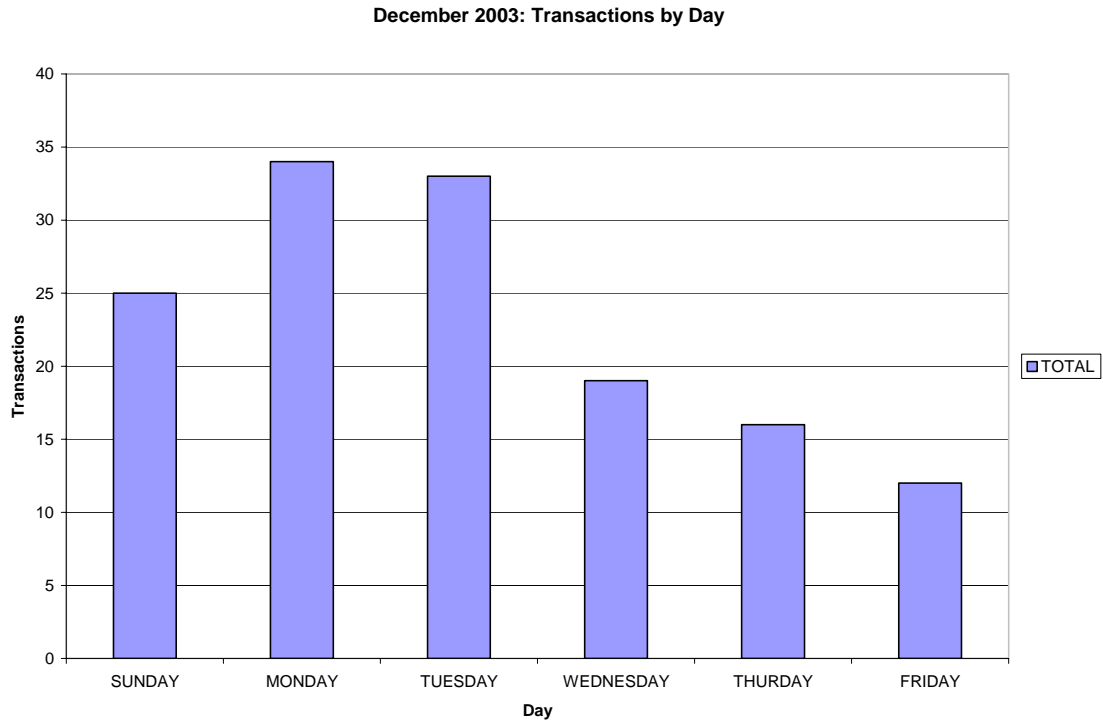


Figure 12.

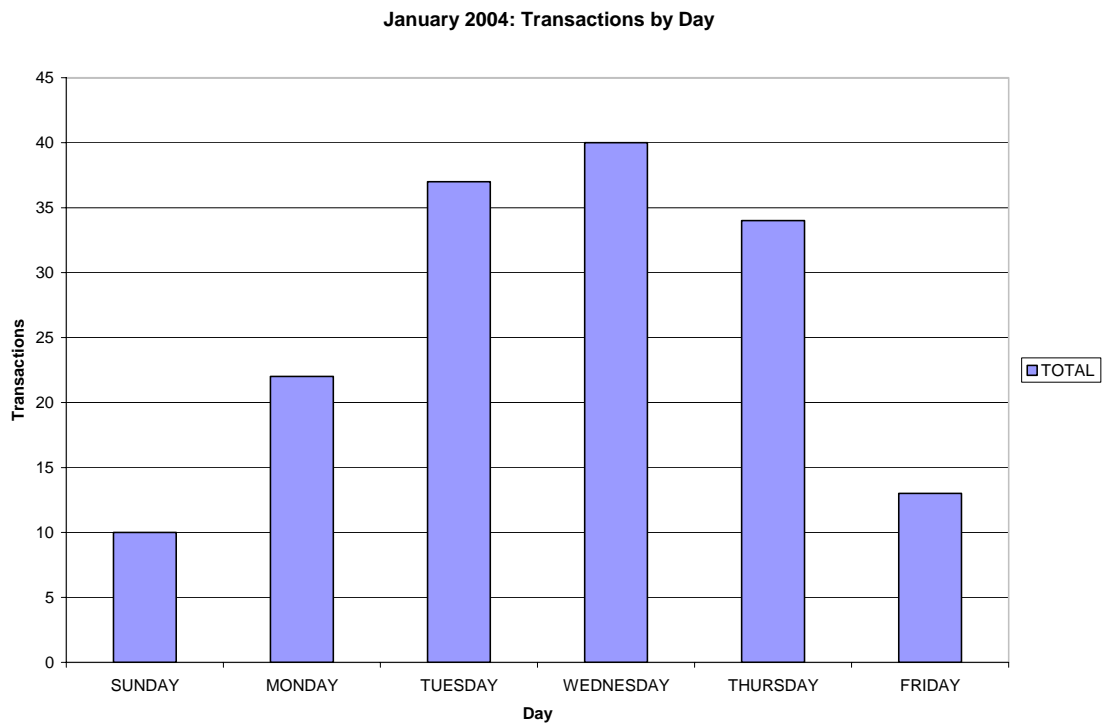


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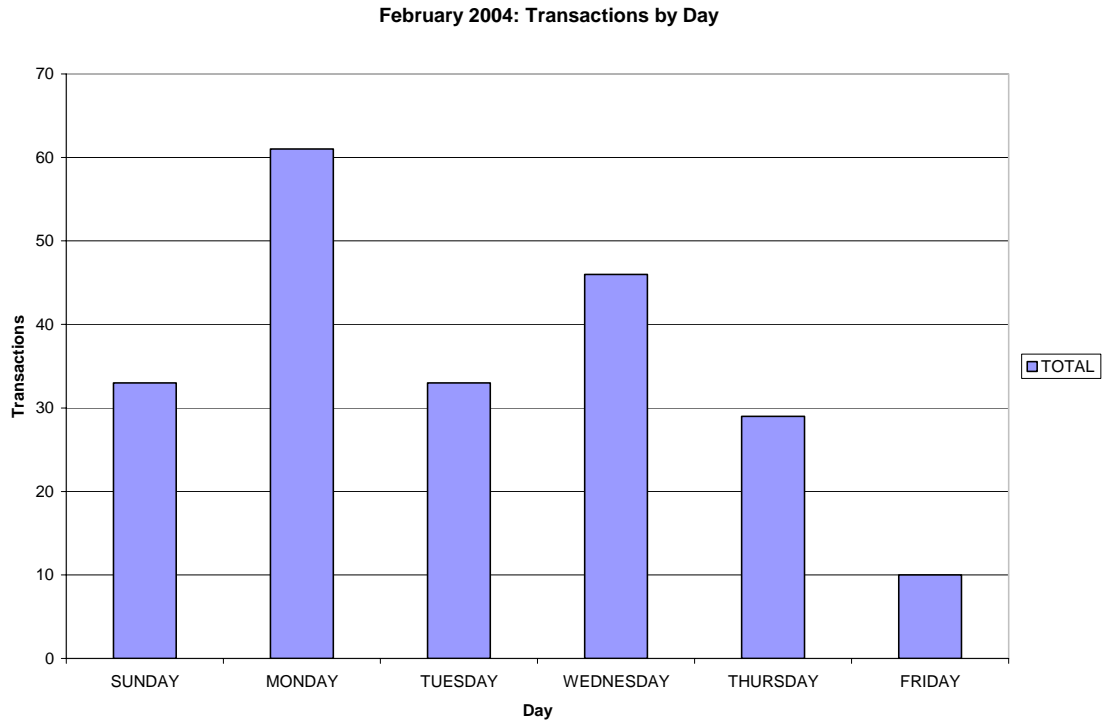


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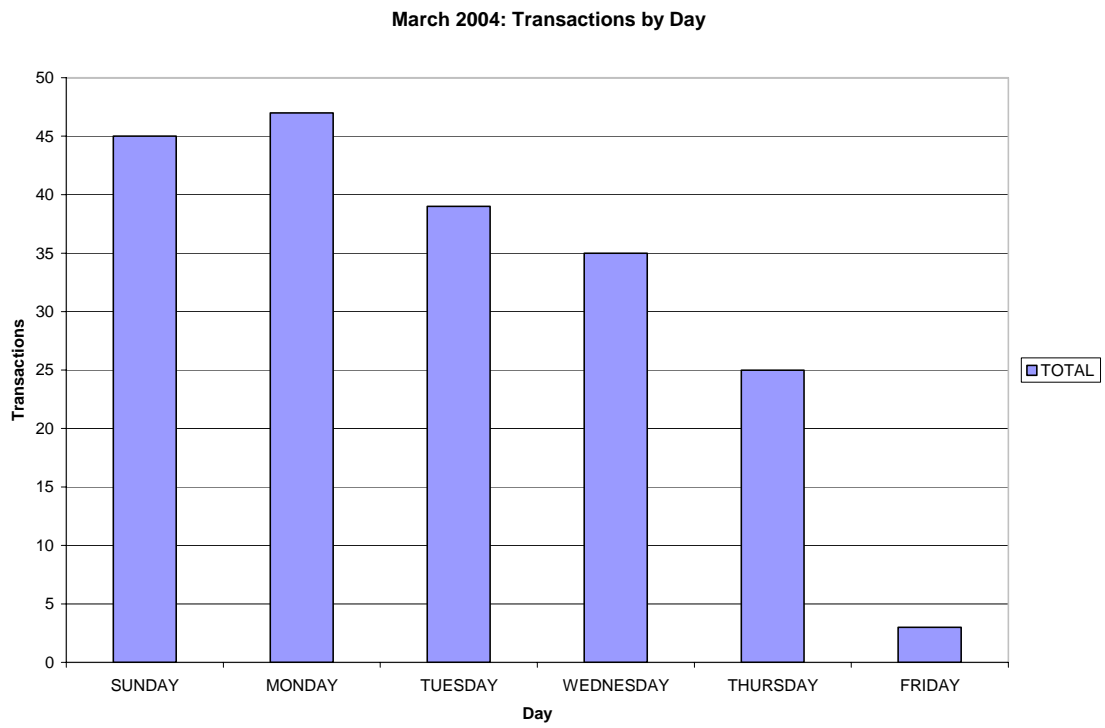


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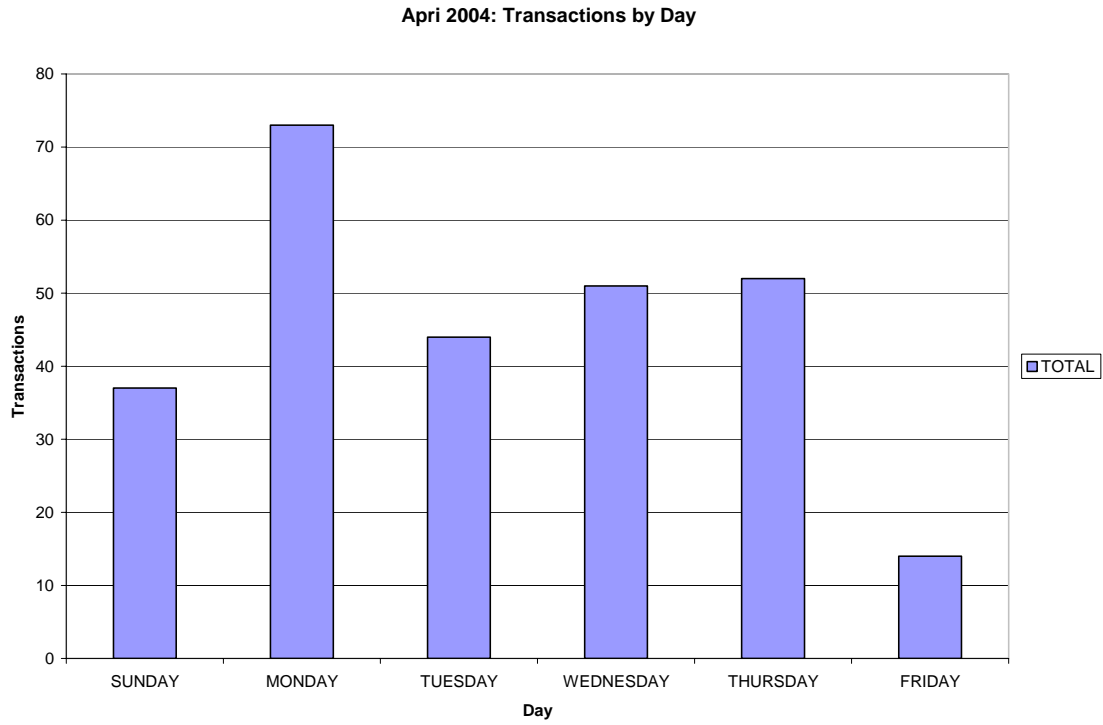


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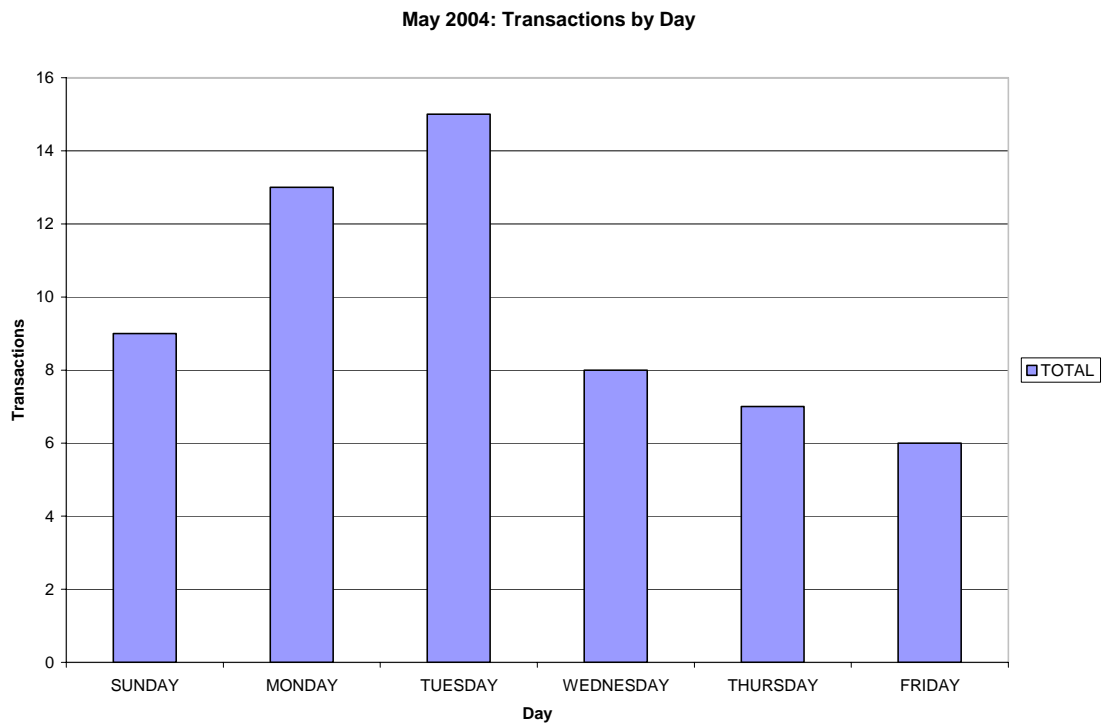


Figure 17.

Appendix F – Usage by Hour of Service

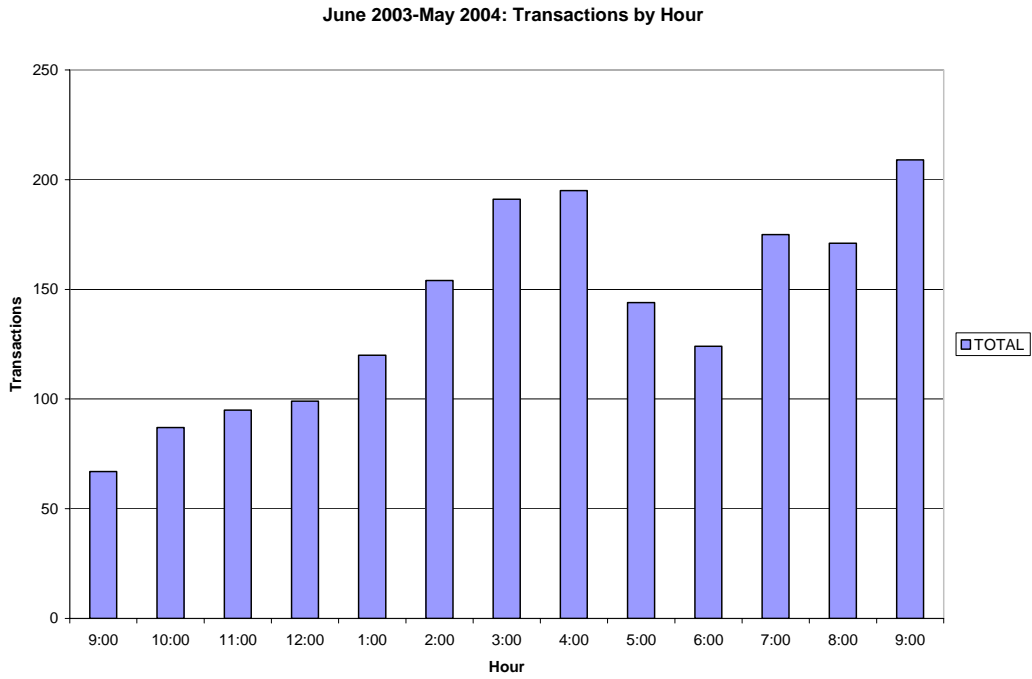


Figure 18.

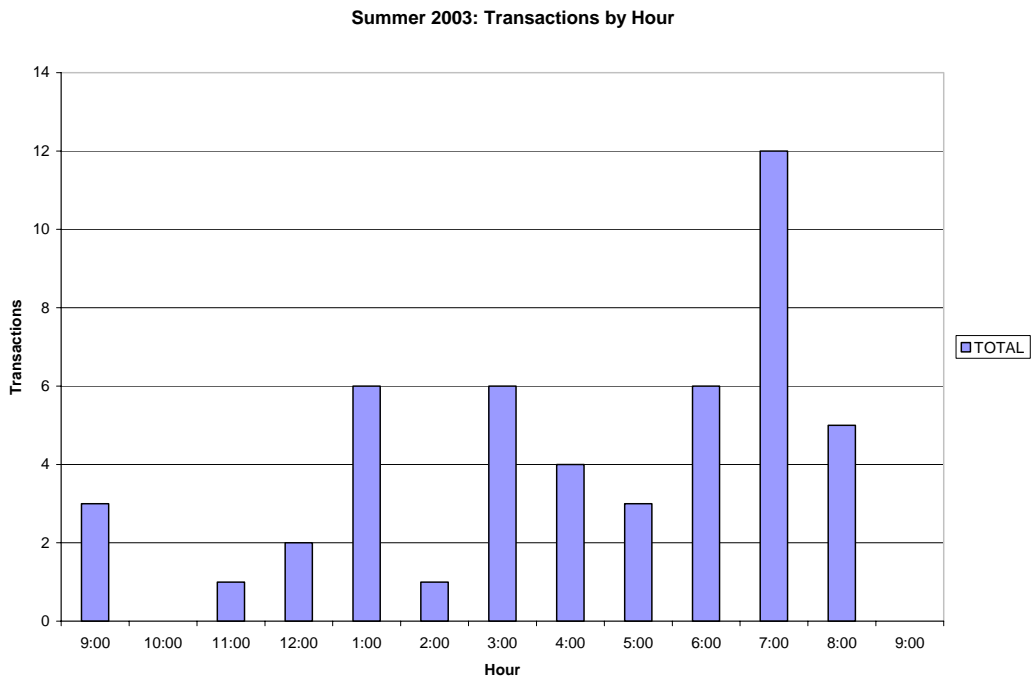


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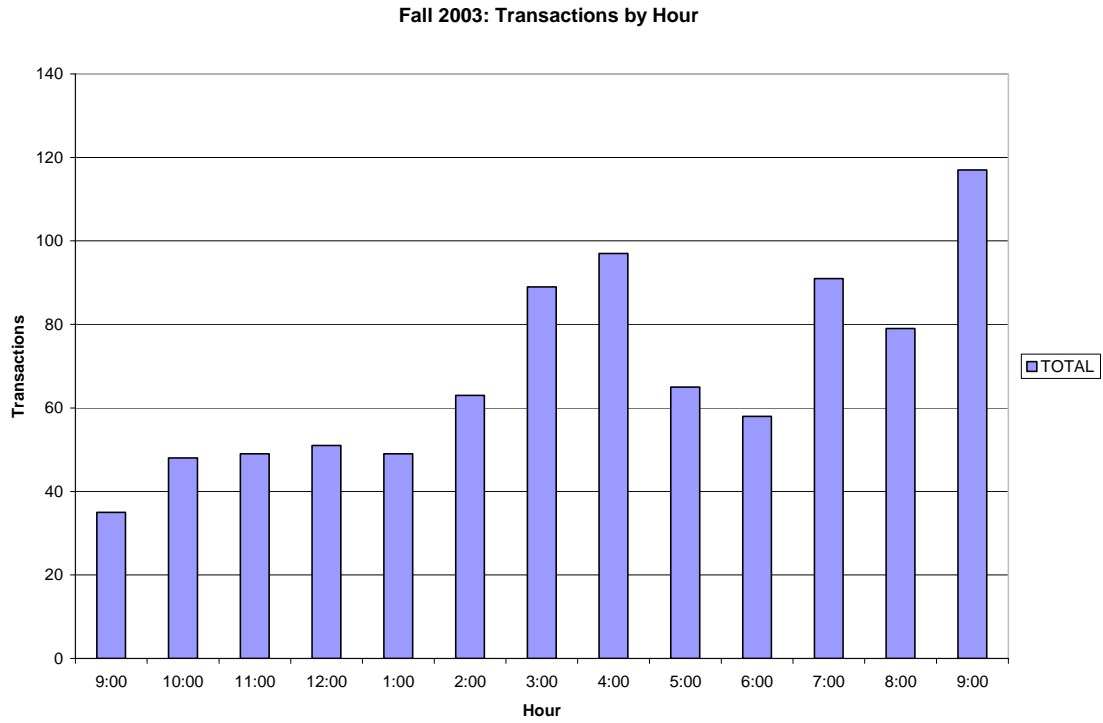


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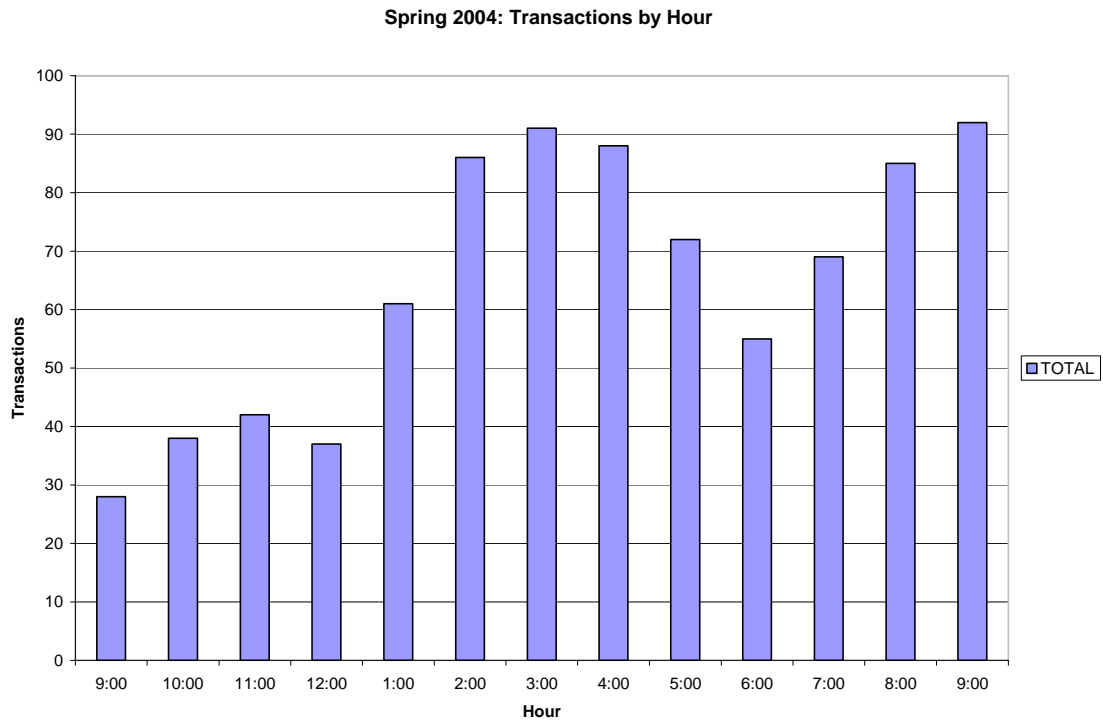


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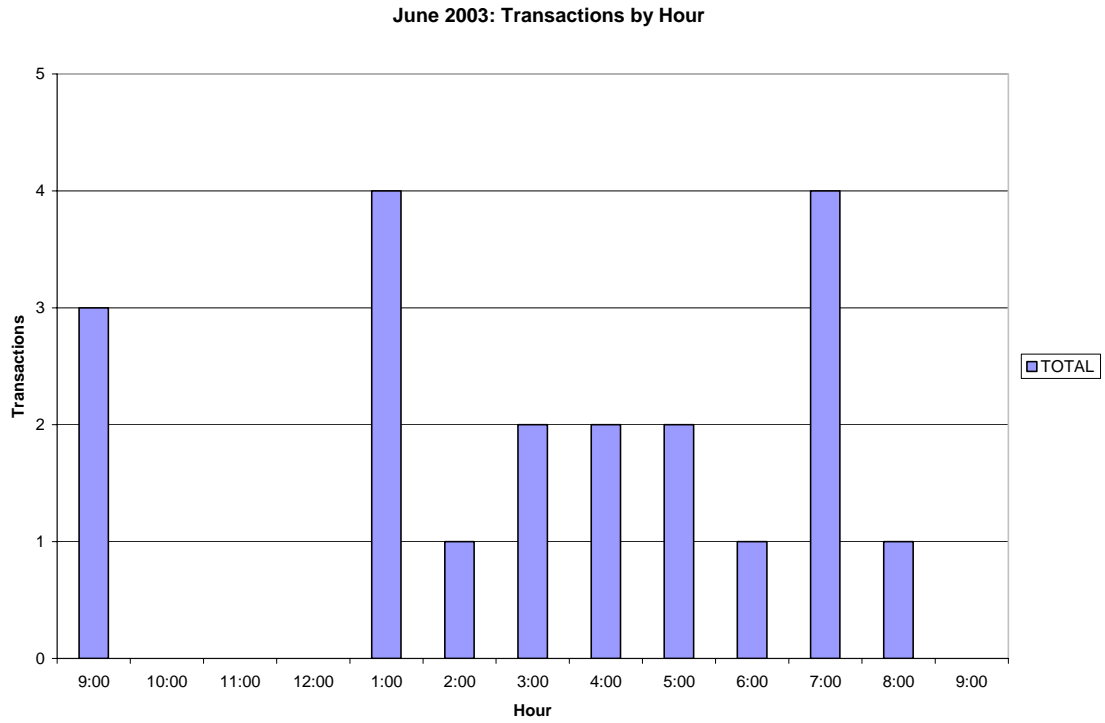


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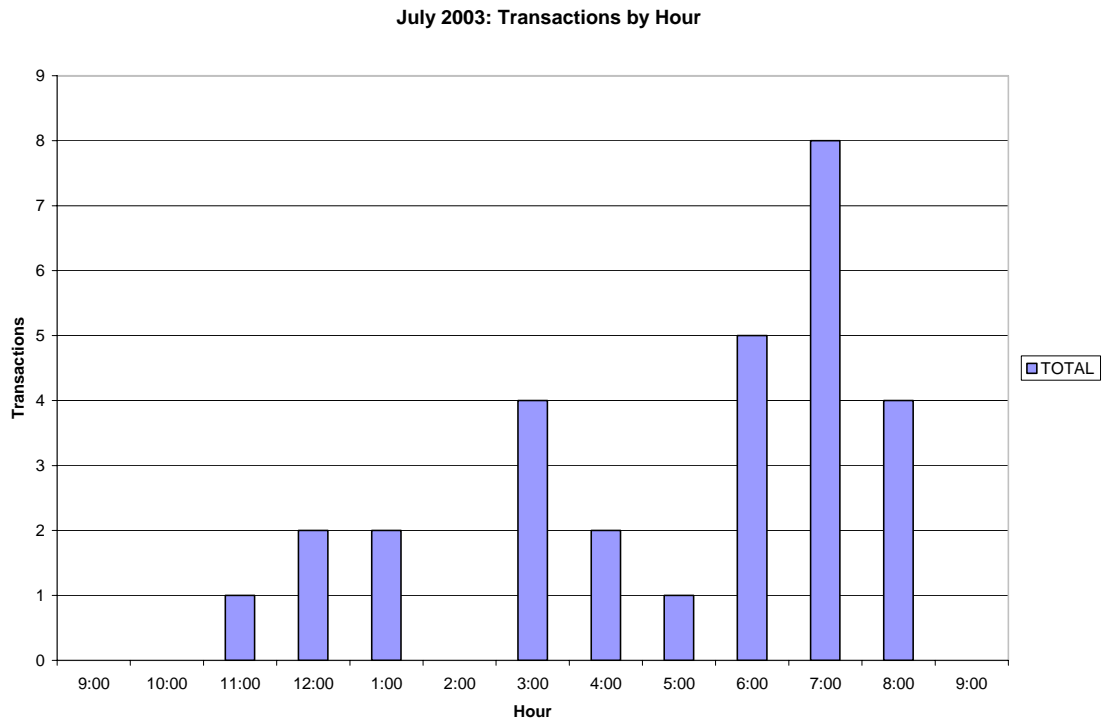


Figure 23.

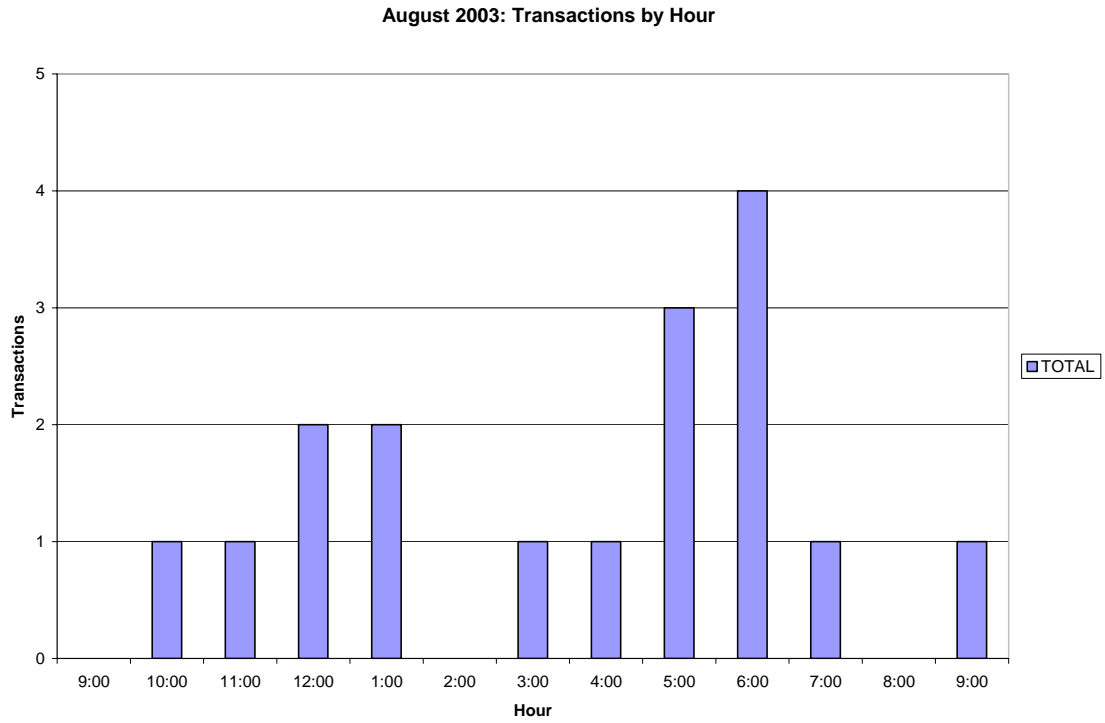


Figure 24.

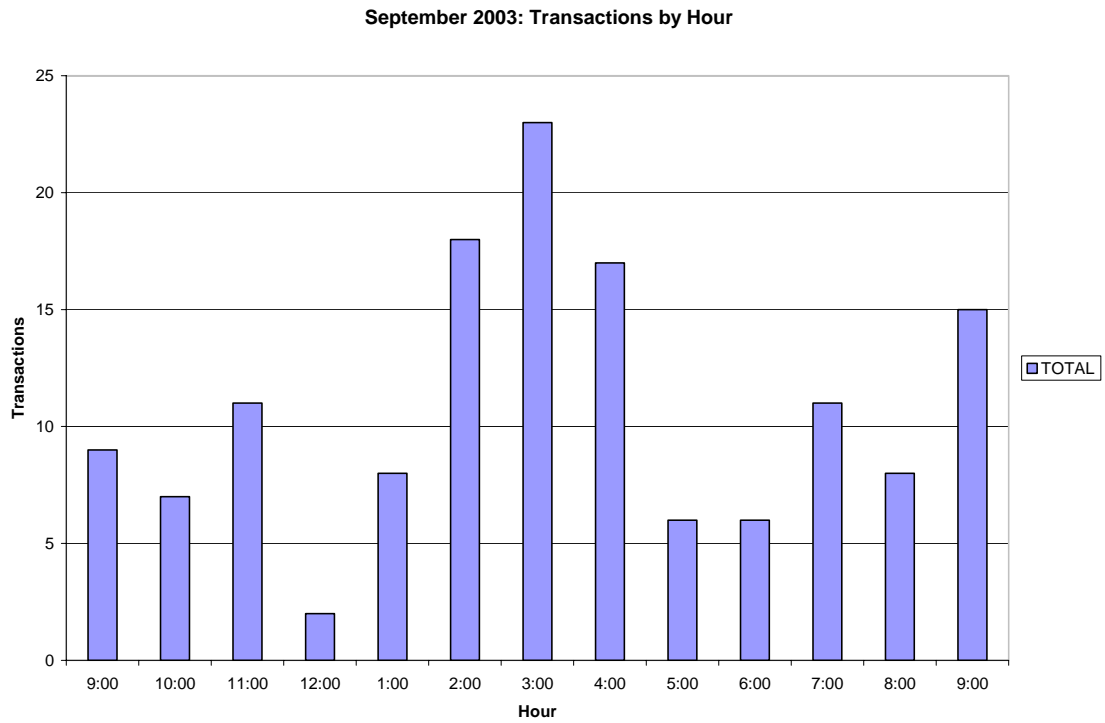


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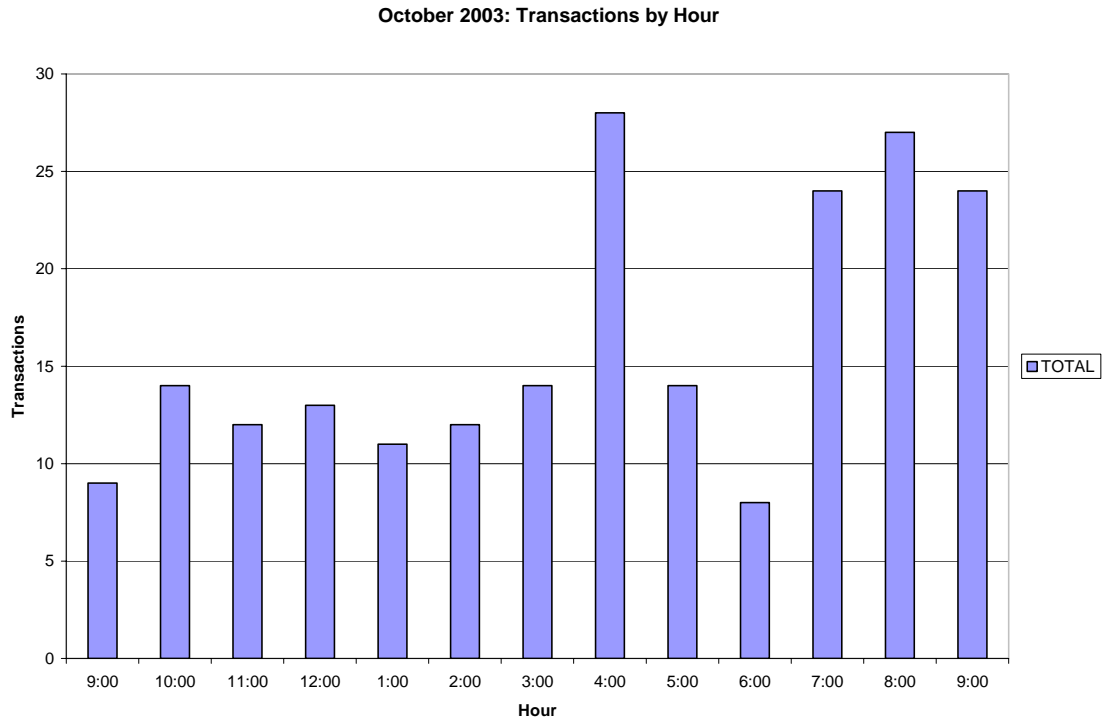


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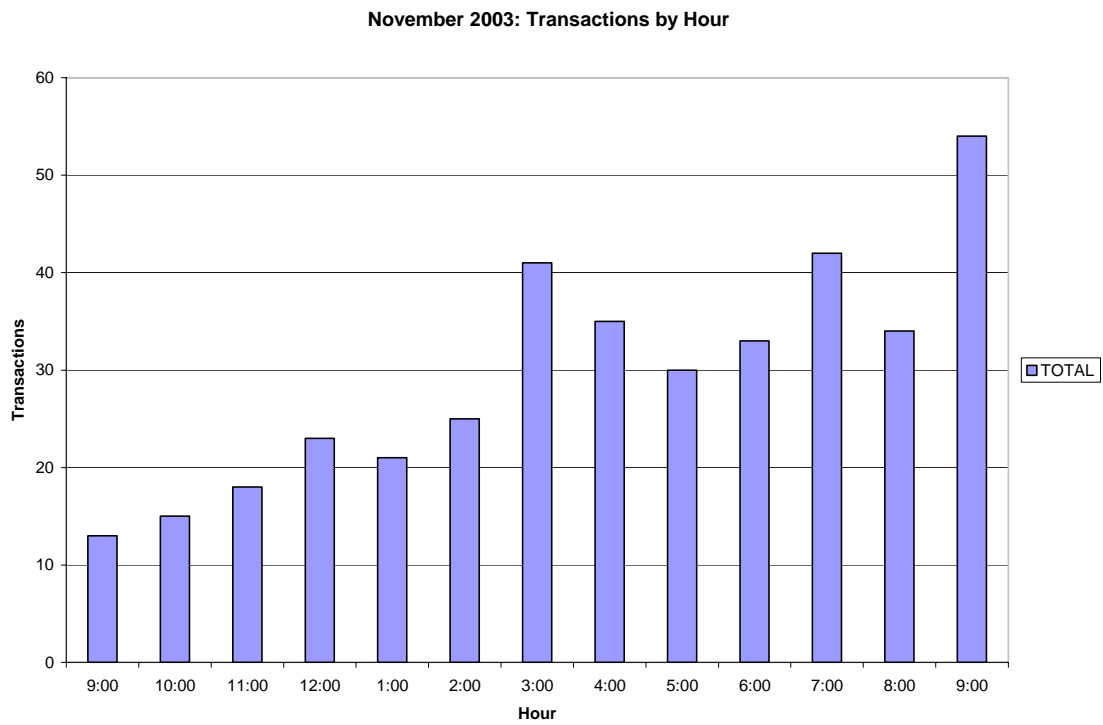


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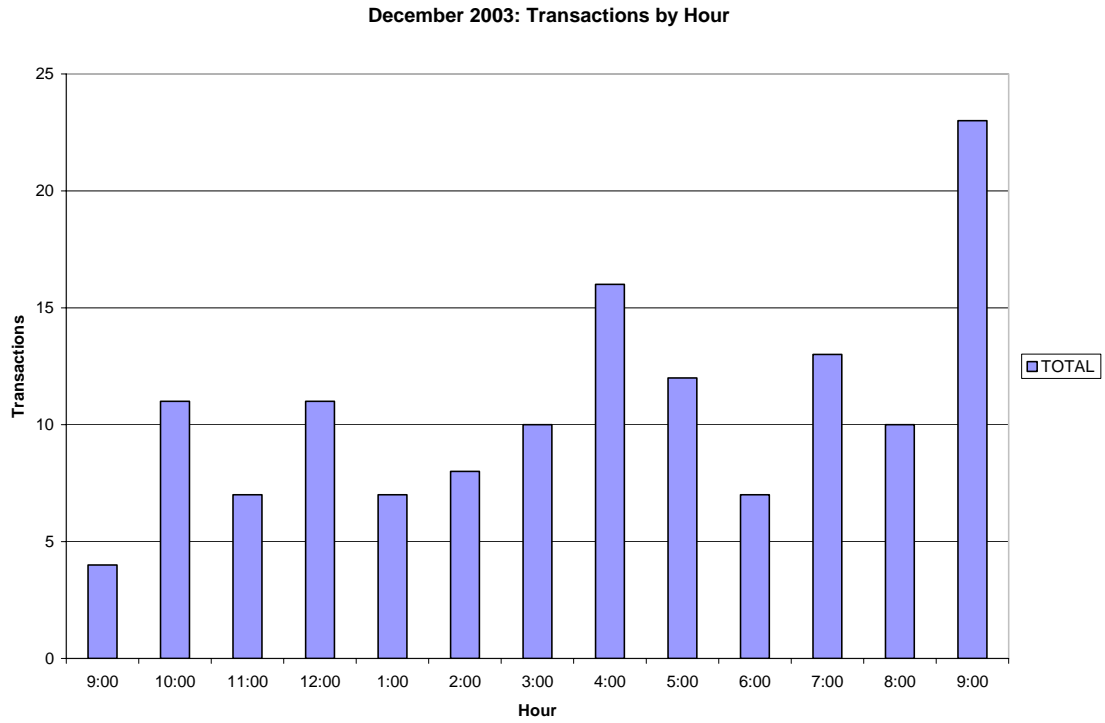


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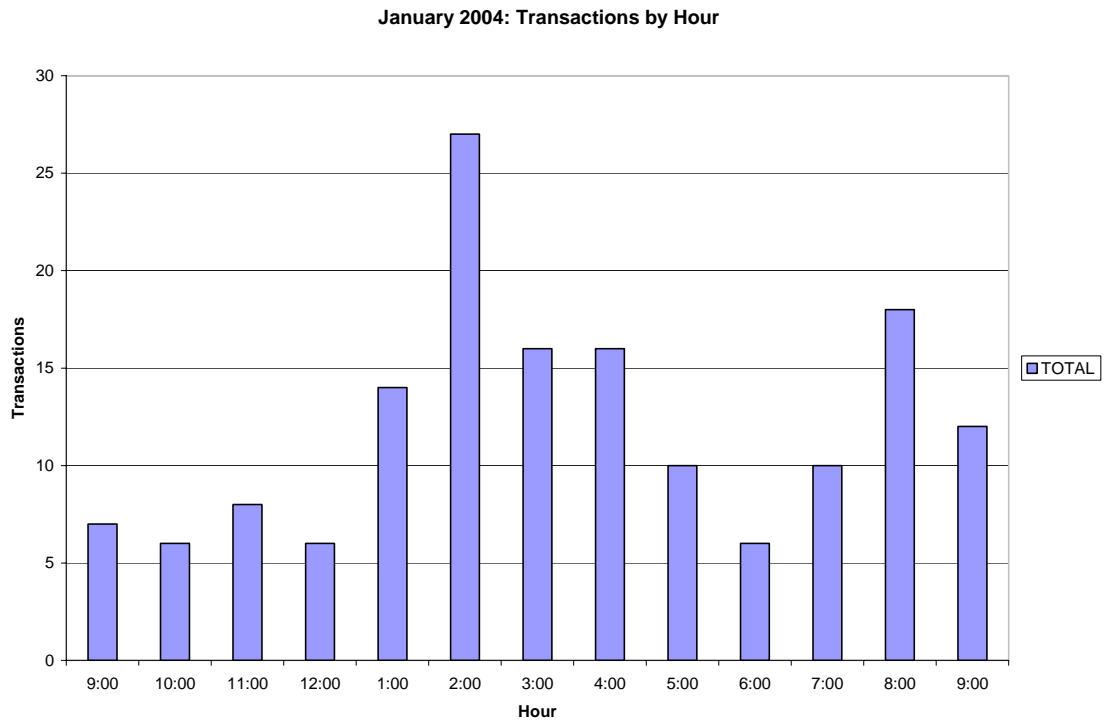


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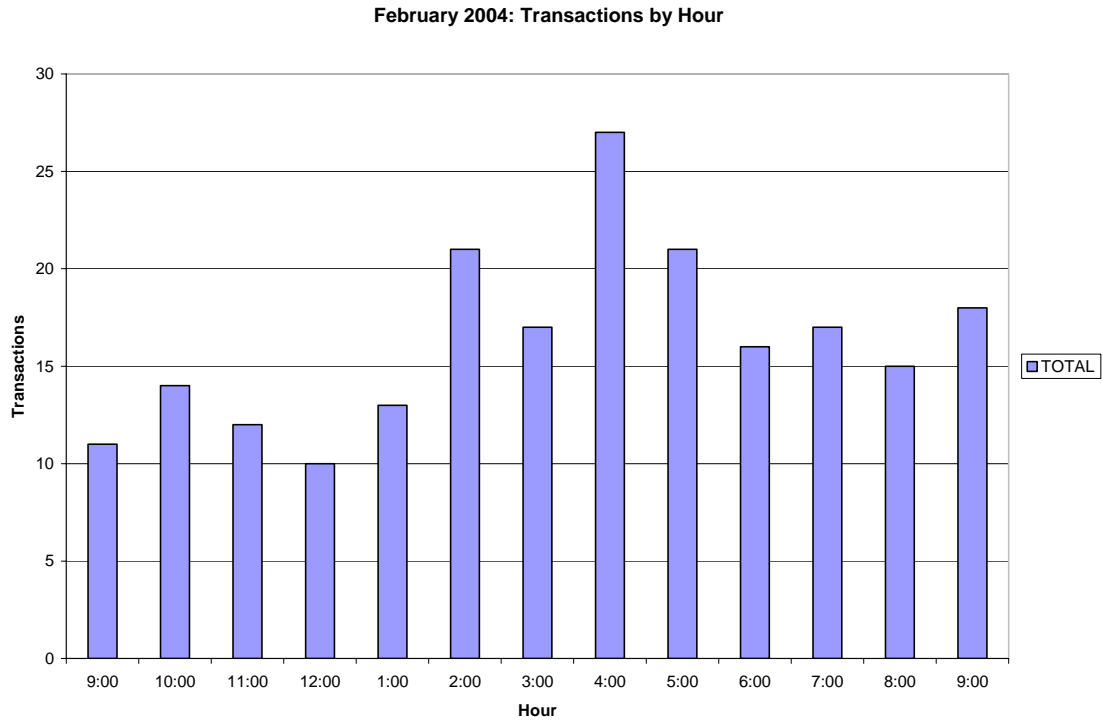


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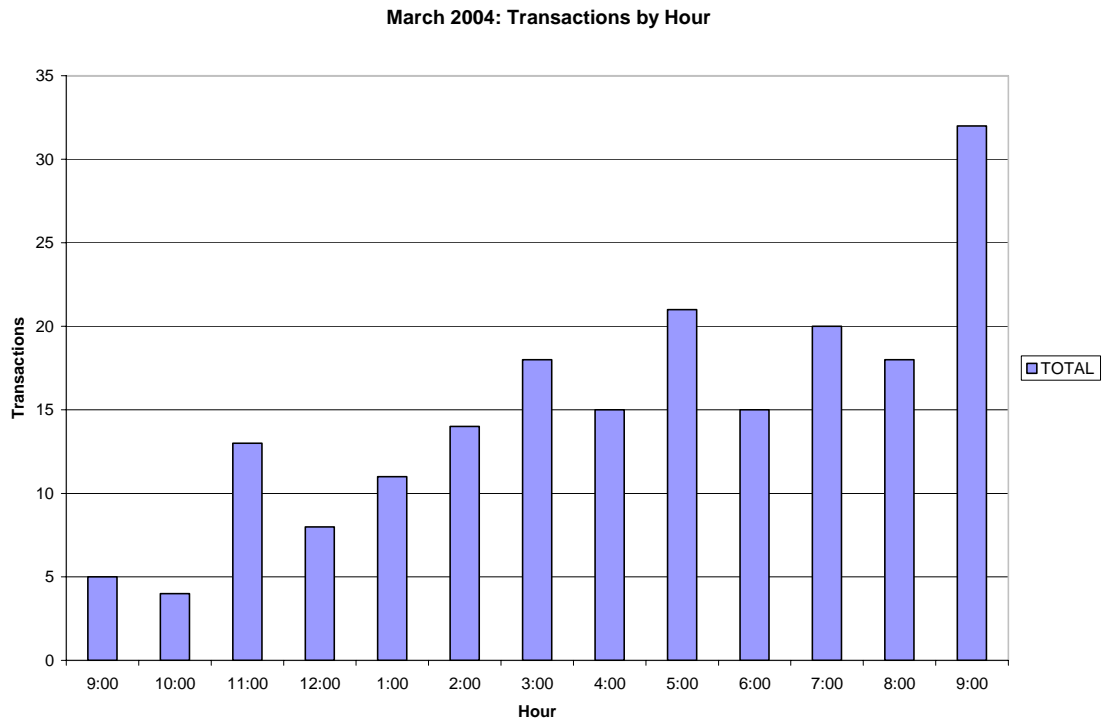


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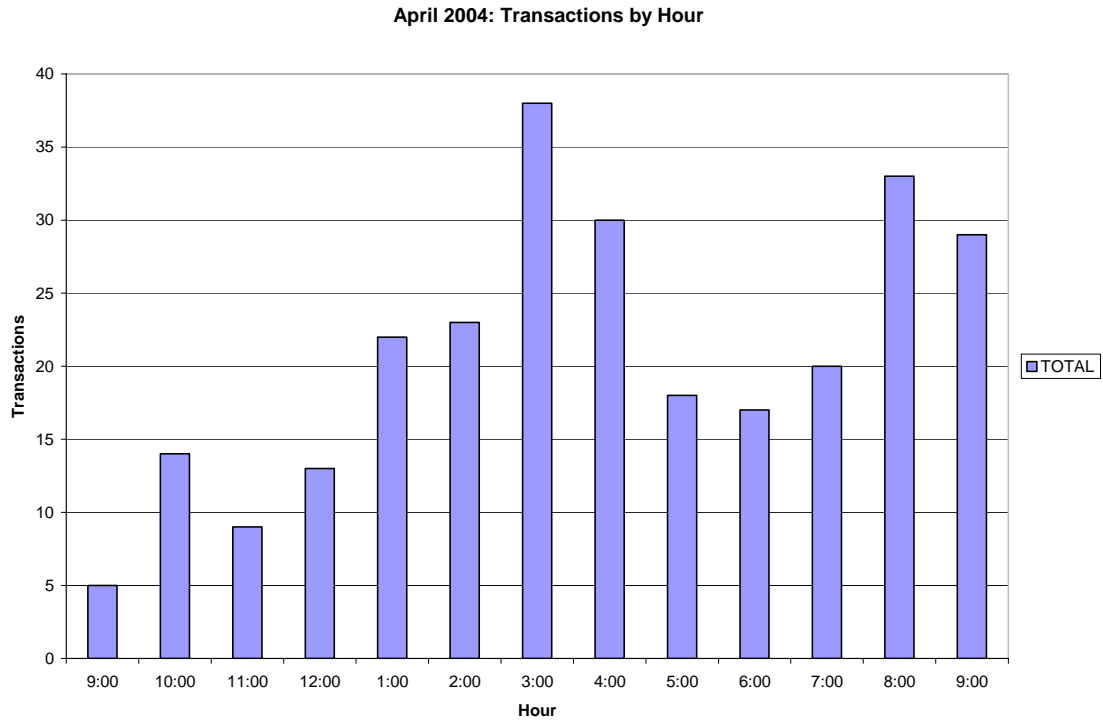


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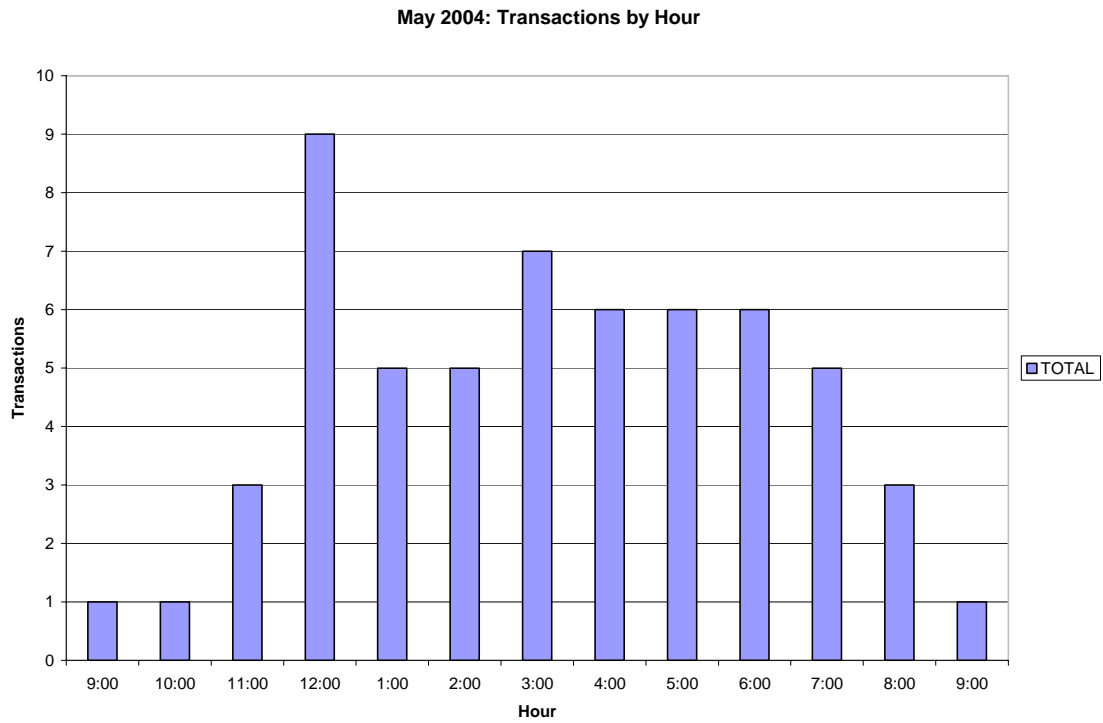


Figure 33.

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