



Theme:

Managing Libraries in a Changing Environment - Legal, Technical, and Organizational Aspects

Count the traffic

Tord Høivik

Associate professor
Oslo University College
Oslo, Norway

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ABSTRACT

Librarians have, in general, very little systematic information about activities inside their libraries. Staff meets users every day, so there is no shortage of impressions, ideas and mental images. But this information is ad hoc and qualitative rather than systematic and quantitative. Most quantitative user studies, like the well-known LibQUAL, tend to gather data by interviews and questionnaires rather than by direct observation of behavior.

The situation is different in the commercial field. Chain stores and services are heavy consumers of survey data. But they also study the actual behavior of their customers as they enter and move around on the premises. Layout, lighting, background music and product placement are typically based on detailed - and costly - behavioral research. Libraries that want to attract more users - who want to spend more time inside the library - need much more information about user behavior, for evaluation, planning and advocacy.

In this paper we present a cheap and simple method to gather such data. It is based on regular and systematic "tours of observation" through the public areas of the library. It can be carried out by the library's own staff rather than by hired consultants. The data gathered will tell you, in some detail, about the structure of activities in the various parts (zones) of the library throughout the day (daily cycle) and the week (weekly cycle). We recommend that data be gathered one day a week, over a period of several months, to avoid large random fluctuations.

The method has been applied in two Norwegian public libraries, in towns with twenty-five and sixty thousand inhabitants, respectively. After a training workshop conducted by the author, data were collected by library staff and analyzed by the author. Many libraries should be able to do the data processing without external help, however. The data analysis is not technically difficult - standard spreadsheets will do. But the generation and evaluation of relevant tables requires some skills in standard social science research. In the article we present the main aspects of method, describe the procedures in sufficient detail for practical use, present some of the main results, and indicate how such data can be used for advocacy and strategic planning.

MAIN TEXT

TTT and similar studies

The method we have called TTT - from the Norwegian expression *Tverrgående TrafikkTelling* (transversal traffic counting) - is known as seating sweeps in the English-speaking world. Its systematic use seems to have been initiated by two Canadian researchers, Lisa Given and Gloria Leckie, who used the sweeps method in 1999, combined with several other approaches, to study the Toronto Reference Library and the Vancouver Public Library.

In modern libraries, most library statistics are based on data that are collected automatically by computerized systems. This applies, for instance, to the number of loans, renewals, returns, active users, physical visits (given electronic counters) and web traffic. But if we want to investigate activities inside the library, we must turn to more manual and labor-intensive methods. The TTT approach was developed to collect relevant information on user behavior inside the library in a simple and convenient way.

Manual data collection can never be as cheap as automatic data collection. But TTT is designed to make the heavy work of direct data collection as light and convenient as possible, without reducing data quality. The method is based on regular "observation tours" through the public areas of the library, carried out by the library's own staff. On these tours, which are typically repeated once an hour, the observers note what each visitor is doing and register the activity on a standardized form. Privacy is protected. We do not collect data on individuals, but only on activities.

The method was first tried out, on an experimental basis, in a large metropolitan library (Oslo, 500.000 inhabitants) and in a small rural community (Gjerdrum, 5.000 inhabitants). In the period 2006-08 the staff in two medium-sized public libraries - Lillehammer and Drammen - undertook full-scale TTT studies. In this paper we concentrate on data collected in Drammen in 2007.

Last year (2007) five of the largest public libraries in Norway also carried out an observation-based study of user behavior. They used a somewhat different methodology. Instead of "sweeping through" the building at regular intervals, they "shadowed" individual users, and registered their activities from the moment they entered till the time they left the library. This unobtrusive approach was generally successful. Few of the observers were noticed. At the exit, the user was approached by the observer, asked about their age, about their spoken language at home and about the language they preferred to use when reading.

Shadowing gives more information about individual behavior than the sweeps approach. Since the Metropolitan Study ("Storbyundersøkelsen", SBU) was combined with an exit interview, it was also possible to link background and behavioral data. The shadow method is much more labor intensive than the sweeps method, however. It provides very rich data - but these must be analyzed by professional social scientists (I would argue) in order to manifest their value. At the moment (May 2008) only a rather basic report has been released, but it indicates that results from the two studies are highly compatible.

Observational work continues. Two academic libraries have carried out TTT surveys on their own, but have not yet published their results. In May 2008 more than thirty second year library students undertook TTT-studies in local libraries as part of their five week period of in-library service. We plan to do a comparative analysis of all these studies in the near future (08/09).

Sweeping observations

Observation takes place while you walk at a moderate pace through the building. Before observation starts, you must divide the public area into zones that you believe have different patterns of use. How this should be done will obviously differ from library to library. The division into zones ought to reflect the library's own thinking about its use of space. To create zones you need a floor plan of the library. An architectural plan may be available - otherwise make your own sketch covering all areas open to the

public. On the floor plan you trace a path that will take you through all zones and allow observation in all corners, nooks and crannies.

You also need to define the activities you want to register. Since we are observing, often at some distance, rather than interviewing, we must stick to behavior that can be easily observed. Sitting, standing and walking are visible activities. So is speaking and reading. But we cannot - in general - tell which kind of book a person is reading without getting too close for comfort. Patterns of activity will differ from place to place inside the library. People will walk when they browse the stacks, but sit when they try to study - usually. They will talk with friends in cozy corners, but keep quiet in the main reading room - hopefully.

Below we present a list of fifteen activities. The categories have been developed, by trial-and-error, in four different libraries over a period of several years. There is nothing sacred about this particular list. But I believe that library researchers tend to use too many ad hoc instruments. Within national library communities, at least, a degree of standardization is useful. Most practice-oriented library debate takes place within - rather than between - countries. This particular instrument has been designed within and for Norwegian public libraries. I believe it fits current European conditions, but it may need some adaptation for use in academic and special libraries.

We have settled on the following categories:

1. **Walks or stands alone.** Covers standing or walking around without browsing and without relating to library staff or other users.
2. **Walks or stands in company.** Participates in a group of two or more persons that stands or walks around without browsing and without relating to library staff.
3. **Sits alone.** Sits alone without relating to media, to library staff or to other users.
4. **Sits in a group without media.** Participates in a group of two or more persons that does not relate to books or other media or to library staff.
5. **Browses alone.** Covers browsing or scanning of items on shelves while standing or walking around.
6. **Browses in company.** Participates in a group of two or more persons that browse or scan items on shelves together while standing or walking around.
7. **Sits alone reading (or writing)** . Sits and reads by her/himself. Includes individual work - reading and or writing - without using ICT. Includes listening to music, watching videos and using other media - but not the use of computers.
8. **Sits in a group with media.** Participates in a group where at least one person relates to books or other media. [Use (10) for groups with active PC].
9. **Sits alone with own computer.** Sits alone with active mobile computer (active screen).
10. **Sits in a group with own computer(s).** Participates in a group where at least one person is using a PC of their own (active screen).
11. **Sits alone with library computer.** Sits alone with active computer (active screen).
12. **Sits in a group with library computer(s).** Participates in a group of two or more persons that is using one or more library PCs (active screen).
13. **Contact with staff.** Covers all direct contact with staff. Here we want to register activities where staff spends time with the users, whether it involves speaking, writing, demonstrating or walking around.
14. **Queuing.** Covers all visible waiting for service or facilities, whether in a proper line or not: waiting for staff, waiting for access to equipment, toilet queues, aso.
15. **Other activities.** Activities not covered by 1-14.

No river, no city

The municipality of Drammen, with fifty-five thousand inhabitants, is the seventh largest city in Norway. It is an important trade and transport center forty kilometers southwest of Oslo. The local government presents the community as follows:

The fjord and the river have been the basis of existence for the inhabitants of Drammen for

many centuries, indeed this is the life nerve of the city. The river has carried river prams, barges, small vessels and modern-day leisure boats, and was for many years one of Norway's largest logging rivers, second only to the Glomma.

From the 1850s onwards, many steam-powered sawmills and planing mills were established along the lower section of the river, and in the course of the 20th century the paper and cellulose industries boomed. Later on, however, in the 1960s and 1970s, the cellulose industry experienced an economic decline, causing the factories to close down one after the other.

As industrial activities declined, Drammen was forced to redefine its economic role. Like many other towns, it began to focus more on education, innovation and cultural activities. Through a major planning effort, the old industrial areas on the west side of the river were converted to modern office buildings and apartments - with wide views over the river itself. The old public library - on the east side of the river - was closed down. The new Drammen Library, on the west bank of the river, shares a brand new building with the Drammen campus of Buskerud University College. This is the most important academic institution in the region. The library itself is an experiment, since it combines the roles of a public and of an academic library.

Basic results

Between May and November 2007 Drammen Library carried out systematic observation of its customers using the TTT (or sweeps) method. On six random days, covering the six days of the week from Monday till Saturday, staff members walked through the public areas once an hour - and observed the pattern of activities in each zone. Comparing the statistical data with intuitive expectations, it is fair to say that

1. the actual use of computers - including personal (mobile) computers - was higher than expected
2. the frequency of activities carried out in groups - involving children and students in particular - was higher than expected
3. purely social activities - not involving computers or media - were higher than expected

It is worth remarking the libraries are self-service institutions. Library staff have busy days. When they work at the service desks, there is a steady stream of users asking for assistance. At the very start and towards the very end of the day, there may be some quiet periods. But in general the staff experiences constant demands for attention. If we look at the library through the eyes of the users, however, staff plays a minor role. Most patrons manage their own business. The average user only spends three percent of her or his time in direct contact with library staff.

But the library is still a rather social place. Some people use the library together with family, friends or fellow students. Others come as individuals. In Drammen, collective or social use was almost as frequent as individual use. A few of our categories - I am referring to contact with staff, queuing and other activities - are neither typically individual nor typically social. These activities comprise nine percent of the total. The remaining time is split almost equally between collective (46 percent) and individual activities (54 percent). Interaction and collaboration with others is a normal component of library use.

In Drammen, the presence of students tilts the balance towards the social. But our data from Lillehammer, as well as from the Metropolitan Study, point in the same direction: libraries are social. Visiting the library is quite often a collective activity. I would even predict that the social role of public libraries is increasing. We will test this out in Norway. And I believe we will find the same trend in other post-industrial countries. The borrowing of books and visits associated with lending may decrease, but the social use of library space is likely to go up.

Take Tromsø, the biggest city in Northern Norway. Tromsø opened an impressive new public library in 2006. The old facilities had been quite inadequate for many years, and the number of library visits has rocketed: from 3.9 in 2005 to 7.0 per inhabitant in 2006. But lending shows only a moderate increase: from 5.0 in 2005 to 5.7 in 2006. It is the in-house activities and the social use of the library that has

boomed.

Spending time

The average length of stay at the Drammen library was above forty minutes. In Lillehammer, which is an ordinary public library, the average was less than thirty minutes. The difference is probably due to the number of student users in Drammen. Lillehammer also serves a small student group, but most of the Lillehammer students use the library facilities of the local University College.

The TTT approach allows us to compute averages, but not the detailed distribution of time spent. But we know from the Metropolitan Study that the time distribution is highly skewed. The five cities ranged from 22 to 45 minutes. The grand average was 35 minutes and the cumulative distribution as follows: up to 5 minutes – 27%; up to 15 minutes - 52%; up to 30 minutes – 71%; up to 45 minutes – 80% (ABM-utvikling, 2008, pp. 45,27).

It is very likely that Drammen and Lillehammer follow the same skewed pattern. This would also imply that a minority of the users represent a very high proportion of total usage. In the Metropolitan Study the twenty percent that stayed for more than three quarters of an hour contributed nearly seventy percent of total user time. In other words: the user we tend to encounter inside the library are not representative of users in general.

Three floors

The three library floors have different functions and use patterns. When you walk into the library from the vast atrium, you enter the children's section, where the main staff desk is located. Smaller children can play with toys, consult picture books, roll on the floor or dress up as pirates and princesses. Somewhat bigger children can read or play suitable computer games. On the ground floor there is also a quiet reading area in the narrow corner towards the river. The big windows overlook the water front. Here both adults and children relax - with or without books. This pleasant area is known as The Nose.

The ground floor has more social than individual use: 56 versus 44 percent. The groups mainly consist of parents with children, and of children with their friends. The ground floor area is relatively small, which gives staff the possibility to monitor what is going on. The first and second floors have footprints that are three times as large.

A broad stairway will take you from The Nose up to the first floor. The area facing the river is the youth section, with a good selection of magazines, comics, fantasy books and a few computers dedicated to game playing. There is a second staff desk next to the stairway - followed by a large room with fiction in many languages, a small newspaper section, a long row of computers and many places where you can sit down and read, talk or relax. Further in you find non-fiction as well as a music section. On the first floor individual use is twice as common as collective use. But you often find people who help each other with the computers, or who watch and discuss the screen together. The computers are organized for individual use, in one linear row, but still attract a lot of collective, social use.

The second floor is open to the general public, and does contain some general non-fiction. Ordinary users may also consult and borrow the academic literature purchased by the university college. But this floor is definitely dominated by the students and their learning activities. Collective use is as frequent as in the children's section: fifty-four versus forty-six percent.

Print and digital media

The library is surprisingly important as a social and individual "living space". In Drammen, people spend twenty-five percent of their time without using media. The same amount of time is used on print and analogue media: books, magazines, newspapers, comics, music, etc. This includes media that people bring with them to the library. We have not tried to distinguish media that are private from media that belong to the library. The dominating medium is clearly the digital one: our observations show that individual and groups have active computers at hand about forty percent of the time.

Computer use is - not surprisingly - lowest on the ground floor:

- ground floor: 30 % of the time is spent with an active PC
- first floor: 42 % of the time
- second floor: 44 % of the time

The growth of mobile computing is starting to affect the library environment. Drammen Library offers free Wifi access, which is a highly popular service. The differences between the floors are very noticeable. The students on the second floor have largely switched to mobile computing. The library computing share was

- ground floor: 87 % of the PC time is spent with a library computer
- first floor: 75 % of the time
- second floor: 24 % of the the time

Among children and students, much of the computer use is collective or social rather than individual:

- ground floor: 44 % of computer time spent in groups
- first floor: 22 %
- second floor: 59 %

Lonely readers?

People still associate libraries with books and reading. But the truth is more colourful. Our mental pictures of lonely readers, rapt in contemplation and lost to the world, do not catch the essence of libraries. In Drammen, the time spent on quiet reading was less than fifteen percent of the total "time budget". The rest was used for surfing and browsing, walking and talking, loafing and playing and rolling around on the floor.

If we order the categories by frequency, we get the following ranking:

1. Sits alone with library computer - 18%
2. Sits in a group with own (mobile) computer(s) - 13%
3. Sits alone reading (or writing) - 13%
4. Sits in a group without media - 12%
5. Sits alone with own (mobile) computer - 6%
6. Sits in a group where people read, write or use other media - 6%
7. Walks or stands alone - 6%
8. Walks or stands in company - 5%
9. Sits in a group with library computer(s) - 4%
10. Browses alone - 4%
11. Contact with staff - 3%
12. Lending/returns (automated) - 3%
13. Sits alone - 2%
14. Browses in company - 2%
15. Other activities - 2%
16. Queuing - 1%

But here different types of users are jumbled together – children and adults, dedicated students and playful teenagers. Given the functional difference between the three levels we get a clearer picture by taking one floor at a time.

Table 1. Social interaction by floor. Time spent on each activity. Percent. Drammen library 2007.

	Ground floor (children and families)	First floor (youth and adults)	Second floor (student and non-fiction)
Use the library alone	33%	60%	45%
Use the library as part of a group	45	31	51
Contact with staff	6	3	2
Other activities	15	6	2
SUM	99%	100%	100%
N	883	1709	1649
Source: Direct observation of activities. Data collected by library staff once an hour through a full weekly cycle (Monday-Saturday) during the period May-November 2007. Data set at Google Docs: see link at http://samstat.wordpress.com/ttt/			

Table 1 shows that group use is very frequent among children and youth. The Metropolitan Study supports these observations. More than three quarters of the children observed in that project used the library together with others. Collective use decreased with age: 0-14 years: 77%; 15-18 years: 43%; 19-30 years: 28%; 31-45 years: 20%; 46 years and above: 15%. In Lillehammer 2006, however, the time spent socially was rather less – about twenty percent.

The brand new Drammen library represents a new type of urban space: inviting, social and well equipped for digital use. Norwegian survey data suggest that traditional print media have been in decline since the 1990s. Inside the Drammen library, digital media are now more important than print (Table 2). This was not the case in Lillehammer 1.5 years earlier. In that city “only” one sixth of the time at the library was computer time.

Table 2. Media use by floor. Time spent on each activity. Percent. Drammen library 2007.

	Ground floor (children and families)	First floor (youth and adults)	Second floor (student and non-fiction)
Do not use media	27%	25%	22%
Use print media only	23	23	32
Use PC or internet	28	43	43
Contact with staff	15	6	2
Other activities	15	6	2
SUM	99%	100%	101%
N	883	1709	1649
Source: Direct observation of activities. Data collected by library staff once an hour through a full weekly cycle (Monday-Saturday) during the period May-November 2007. Data set at Google Docs: see link at http://samstat.wordpress.com/ttt/			

Compared to Lillehammer, Drammen is a surprisingly international city. Oslo is the most global city in Norway, with a twenty-five percent immigrant population. But Drammen is a good number two, with eighteen percent. Lillehammer, with only seven percent, lies far behind – and below the national average of nine percent.

By *immigrant*, the Central Bureau of Statistics means residents who have been born abroad, or whose parents both have been born abroad. Casual observation reveals, and systematic observation confirms, that immigrants are exceptionally frequent users of public library services – and of their computer services in particular. Digitalization interacts with globalization.

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Traffic count data is also valuable in assessing road safety risk exposure and helping identify how effective past improvements have been. The Auckland Transport traffic flow counting programme is carried out based on road hierarchy and need. Traffic count data. Contact Auckland Transport to request Traffic Count data across the Auckland region prior to 2012. Please note, data prior to 2012 is quite sparse and is only available in summary format, there is no guarantee there will be data available for every site. Multi-camera live traffic and object counting with YOLO v4, Deep SORT, and Flask. GPL-3.0 License. 472 stars. Counts objects by looking at the intersection of the path of the tracked object and the counting line. Hence, those that lose tracking but are retracked with the same ID still get counted. Tracked using low confidence track filtering from the same paper. Offers much lower false positive rate. 10.2.7 Traffic Count Data. Traffic counts in road transport can be both manual and automated (using induction loops in the road surface) counts. Both result in numbers of road vehicles on some road link that usually distinguish between trucks (buses) and cars. The induction loop data can also be used to calculate travel times, but in these data there usually is no distinction between trucks, buses and cars. Counts of trains, ships and... Traffic Volume Count can be done by various methods depending upon various factors like manpower available, budget, technology/instrument available. What is Traffic Volume Count? Traffic Data Collection is basic requirements for transport planning. Traffic Data forms an integral part of national economics and such knowledge is essential in drawing up a rational transport policy for movement of passengers and goods by both government and the private sectors.