

The analysis of sampling data of the usage of the digital reading rooms of the public libraries in the central cities of China

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Abstract:

In China, most of the public libraries, especially the central libraries of large cities or megacity behemoths, have one or more digital reading rooms which have a lot of personal computers that open and free to the public. These digital reading rooms have been providing effective ways for the public to surf the Internet, retrieve information and browse the digital resources. They have become the most important means for the public libraries to improve the digital literacy of the public. Therefore, it is very important to fully understand the state of the usage of the digital reading rooms and the habits of the readers. Thus, we have been cooperating with 15 public libraries from nine large cities or megacity behemoths in China, and have obtained the data of the usage of the digital reading rooms of these public libraries over the past one year (part of the data of several public libraries is less than one year for some technical reasons). We analyzed the data and discovered some characteristics of the usage of the digital reading rooms and the habits of readers of different age and gender. All of these works and results have an important reference value for the public libraries to optimize individualized digital services to different kind of people and further promote the information literacy for the public.

Keywords: Digital reading room, Public libraries, gender, age

1. INTRODUCTION

With the rapid development of the information technology, especially the integrations of the internet and socio – economic (today, it is called the Internet plus), digital services are becoming the most important trend of the information services. In China, facing this challenge, most of the public libraries, especially the central libraries in the large cities or megacity behemoths (the provincial libraries or the city libraries), have equipped one or more

digital reading rooms which have dozens or hundreds of personal computers. Meanwhile, the Ministry of Culture (MOC), which was the department in charge of the public library, launched the Project of Public Digital Reading Rooms since 2012[1]. The main task of the project is to enhance the service capacity, promote the standardization and the open free of the digital reading rooms of public libraries.

For most of the digital reading rooms of public libraries, especially in the large cities or megacity behemoths, people could use the computers free for about 2 hours everyday. The only prerequisite is that the readers need to provide their registration information, either with their ID cards or the readers' cards or even registering on-site directly. The readers could use these computers to surf the Internet, retrieve information or browse the digital resources of the libraries, or using their PADs or mobile phones by WIFI.

Through the opening free of the digital reading rooms, the public libraries have effectively improved the capabilities of digital services, and provide a relative simply way for the readers to use the purchased digital databases which were strictly limited by the copyrights. For the readers, the good service environment of the library, and the combinations of the traditional and digital media, attract them greatly, and help them to improve the digital literacy and use the services of the library more conveniently.

All of these provide us a good condition to deeply study the habits and characters of the readers of the digital reading rooms, and to improve and optimize the services of the digital reading rooms. So, we cooperated with more 200 public libraries in China, and selected 15 public libraries as candidate, obtained their usage data of the digital reading rooms, and completed this data analysis report.

2. DATA SOURCES AND METHODS

2.1 Sample Selection

In China, there are more than 3200 public libraries which mainly located in the center of the cities and towns. And the China also has about 119 large cities nowadays (according to the Chinese criteria for the classification of cities, the large cities should have over 1million population) [2]. And with the help of the MOC and the Project of Public Digital Reading Rooms, we could organize and contact with the public libraries, and select the suitable digital reading room as the sample.

However, because of the vast region and population, and the huge gaps of the economy and culture development of the country, the public libraries frequently have remarkable difference in the service capability, even in the same city, or with the same condition and investment. In order to guarantee the reliability of the results, we only choose 15 digital reading rooms of 15 different public libraries. All of them locate in the large cities of the eastern provinces (the eastern provinces are relatively better in the economic condition in China), and have good records of the stability of service over the past one year. And most important of all, they all must have installed the information management systems to record and store the readers' information and the data of login and logout on computers.

The statistical table of the data of the sample digital reading rooms was listed in the table 1 below. It includes the records from April 2014 to March 2015.

NO.	The quantity of computers in the digital reading room	The number of readers in one year	The number of opening days
1	124	3486	190
2	121	20008	310
3	117	36964	340
4	111	11454	182
5	97	7836	232
6	95	15384	182
7	77	13436	312
8	76	3148	286
9	73	14646	186
10	72	5552	236
11	56	2088	298
12	51	2606	220
13	48	2616	292
14	28	11288	212
15	19	2700	266

Table1: the sample digital reading rooms

It should be noted that the numbers of the readers and the opening days listed in the table 1 above are only part of the actual data for some digital reading rooms, because of a lot of technology and management reasons. For example, for some public libraries, the data would not be recorded by the information management system, if the digital reading room was used to carry out a group training program.

In addition, in order to find the difference between the readers of digital reading rooms and Internet users, we also make some comparisons with the data from the CNNIC report [3].

2.2 Data collection

In order to make this study, we need to get the following data: service time of the digital reading rooms, the service time of the computers, readers basic information (readers age and gender), the login and logout time, and so on.

Since all of the sample digital reading rooms have installed the information management systems, obviously, it is the best way to collect the data through the information technology tools. But the integration of the data is still a significant difficulty during the data collection, because of the difference information management systems of the sample digital reading rooms. Especially, some of the data had never been recorded before, which affects the statistical work deeply, even leads to some sample data invalidly.

So, on the one hand, before the beginning of this study, we had updated all of the information management systems of the sample digital reading rooms, so as to ensure the integrity and accuracy of the data. On the other hand, we collected the data, processed and corrected it with Extract-Transform-Load (ETL) tools, and built a centre database for the work of analysis. And all of these work based on the management system of the Project of Public Digital Reading Rooms, which was invested and built by the MOC in order to prompt and manage the project.

2.3 Data protection

The sample data includes a lot of readers' personal information, so the protection of data is also a very important part of this study. We mainly prompt the data protection from the following aspects:

(1) Simplification of the raw data

For the purpose of management, most of the public libraries asked the readers to provide personal information as detailed as possible. But much of the information is useless for this study, and some of the information is not accurate enough. So, during the data collection, we only extract the necessary and relatively accurate personal information, such as age and gender.

(2) Data security of transport

The 15 digital reading rooms locate in several provinces, so we need to solve the data security during its transportation. First, all of the data was encrypted when it was exported from the database; second, we transferred the data with the private network for the public libraries with better network conditions or with temporary VPN for others; finally, we decrypted the data only before it was imported into the centre database.

(3) Database integration and ID transition

When we obtained the sample data, we imported all of the data into one unique database, instead of several databases, simplified the mechanisms for the system security. And in order to avoid the leak of the readers' personal information, we converted the readers' ID.

3. RESULTS

3.1 Readers' age

First, we drew the distribution map of the readers by age from the statistical data of the readers of the sample digital reading rooms, just as the Figure1 below.

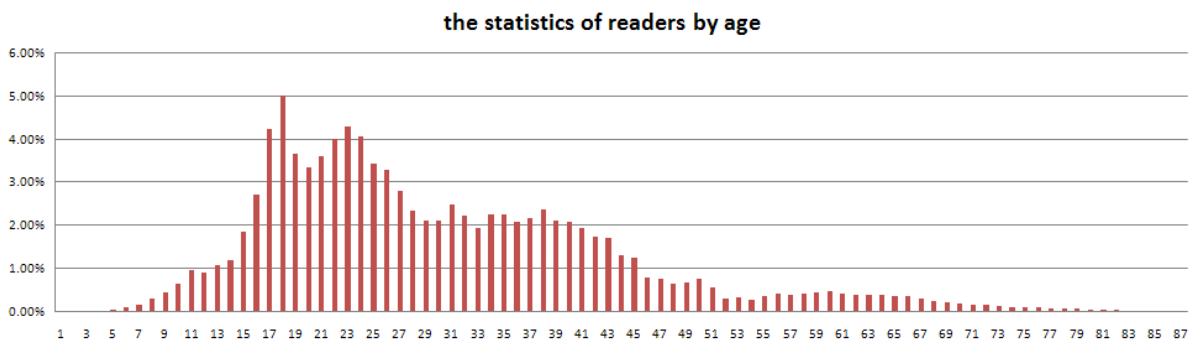


Figure 1: the statistics of the readers by age

We could find that the quantity of the readers increased with age within the scope from 1 to 20 years old and reached the highest peak at the age of 20. Then it shows the fluctuated declining trend with age after the age of 20, especially after the age of 25.

According to the division of population structure of China, we could divide the readers into four categories in accordance with the age: minor (1-17 years old), youth (18-44 years old), middle age (45-64 years old) and the age (over 65 years). We could find that the youth is the major user group of the digital reading rooms as showed in Figure 2.

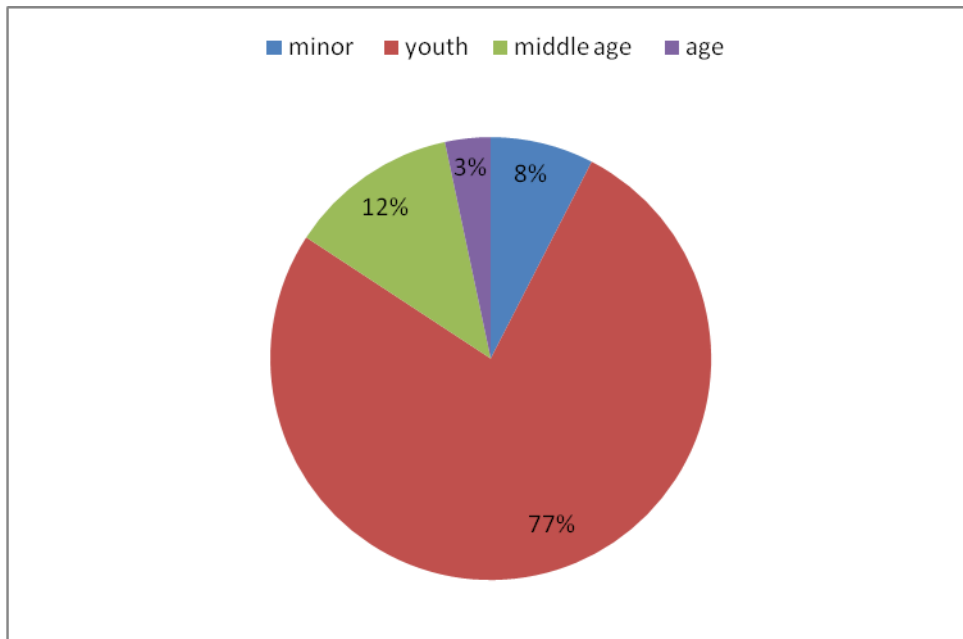


Figure2: the statistics of readers by age group

(1) Comparing with the CNNIC report

The CNNIC (China Internet Network Information Centre) is an important management and service agency of the Internet affairs in China. It published the Annual Statistical Report on the development of the Internet in China (CNNIC report for short) every year, which is the most important and authoritative report on the status and development of Internet in China.

Here, we will compare the difference of the people’s age between the CNNIC report of 2015 [4] and the sample data from the digital reading rooms.

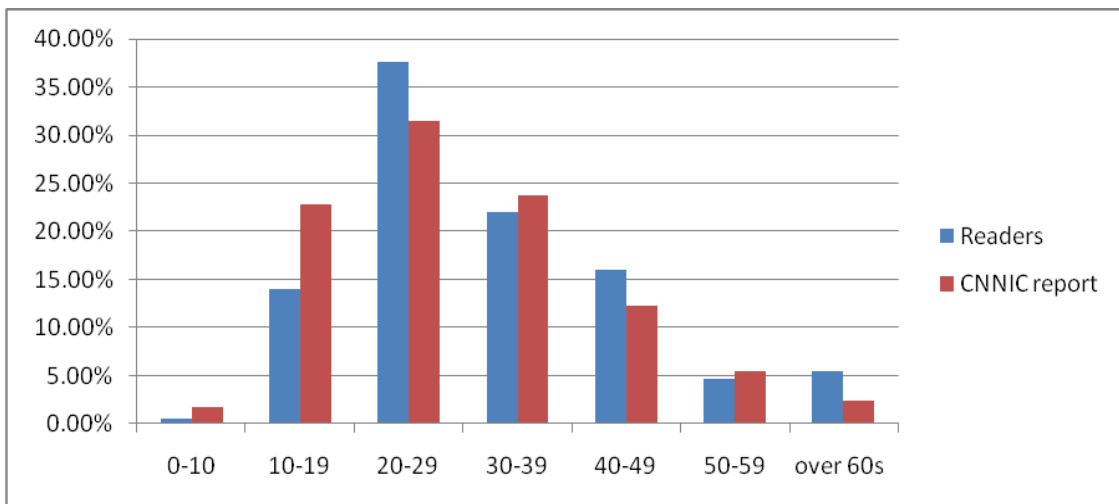


Figure3: the Comparing between the sample readers and CNNIC report

From the bar chart above we could find that the ratio of the readers between the age of 20-29 and over 60s is significantly higher than that of the CNNIC report, while the ratio of the readers between the age of 1-9 and 10-19 is dramatically lower. It indicates that the digital reading rooms have worked well for the orders, but not enough for the children.

(2) Re-visiting ratio

The times of the repeating using of the digital reading rooms of the readers could reflect the attraction of the digital reading rooms for readers. Now, we use the Re-visiting ratio to represent the repeating using of readers. Through the statistical analysis, we found that the readers' re-visiting ratio increased significantly with the age. It again indicates that the digital reading rooms are more attractive for old readers.

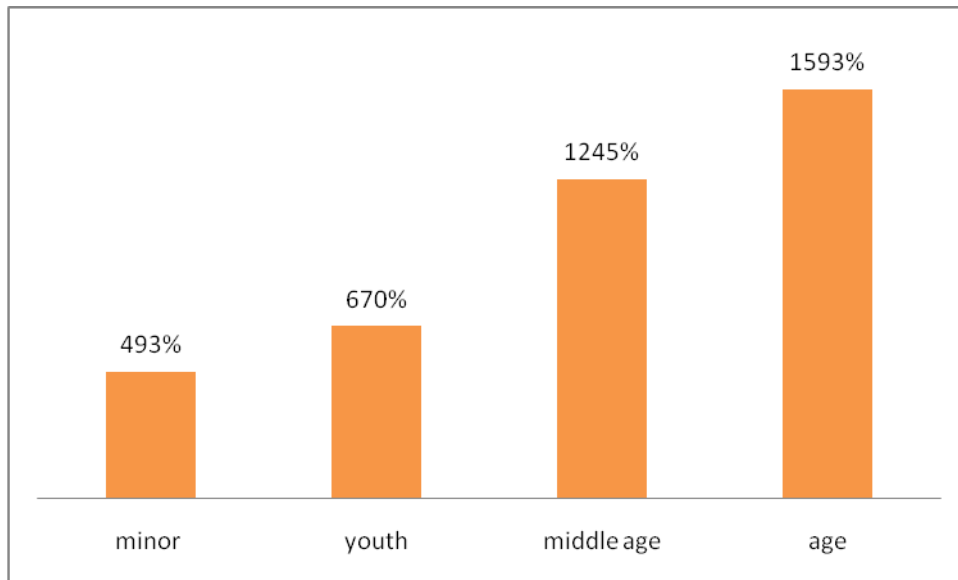


Figure4: the re-visiting ratio of readers by age group

(3) Average using time

The Figure 5 shows the average using time of different readers by age group. We could find that there is no significant difference for most of the readers, except for he minors.

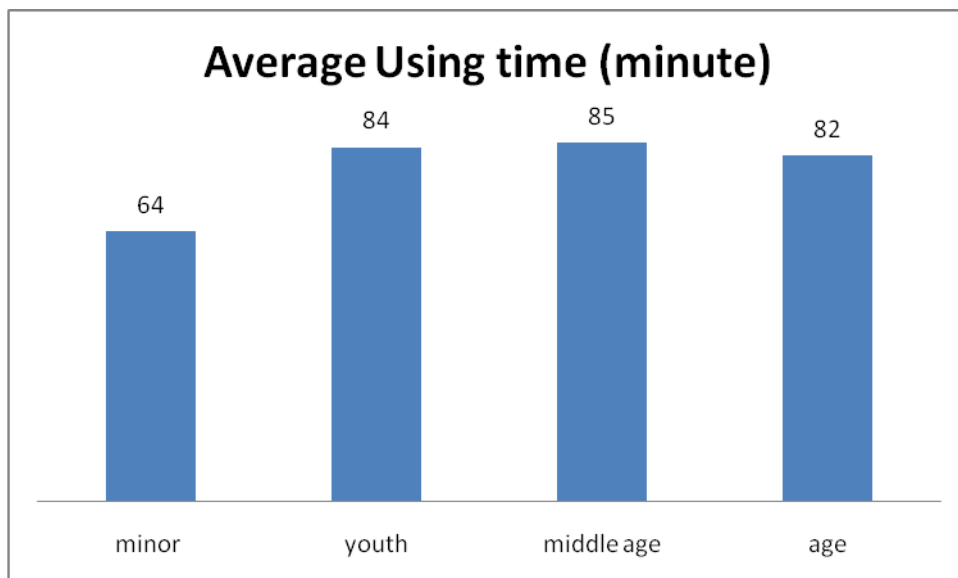


Figure5: the average using time of readers by age group

3.2 Gender

(1) Gender ratio

From the readers' information and login records we could also get the gender ratio of readers. The bar chart below (Figure 6) shows that the proportion of male is 66.25%, and the female is 33.75%. The proportion of male readers is about two times that of women.

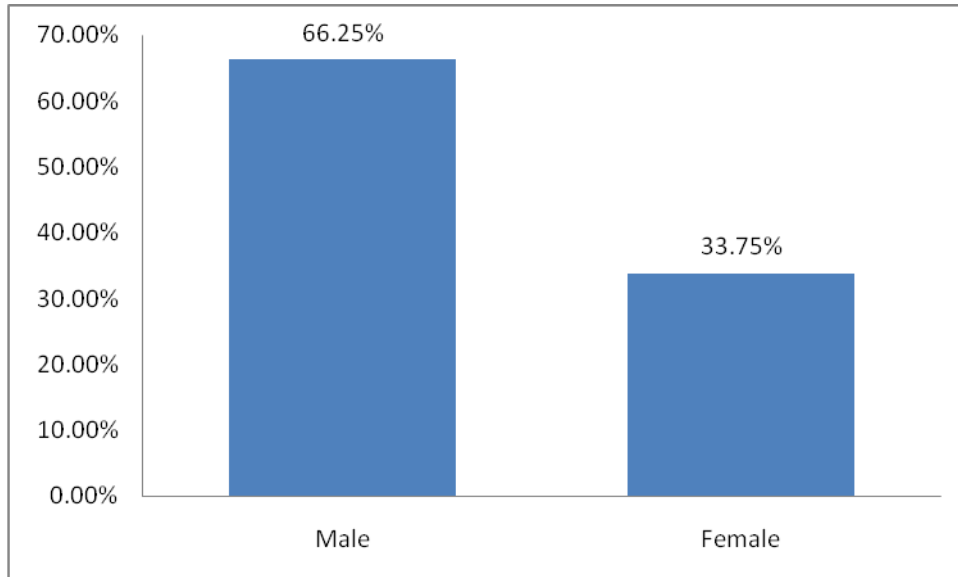


Figure6: the gender ratio of the readers of the digital reading rooms

(2) Comparison with CNNIC report

We could also compare the gender ratio of readers with that of the Internet users from the CNNIC report. We could find that, comparing with the date from CNNIC report, the gender ratio of readers is more unbalanced.

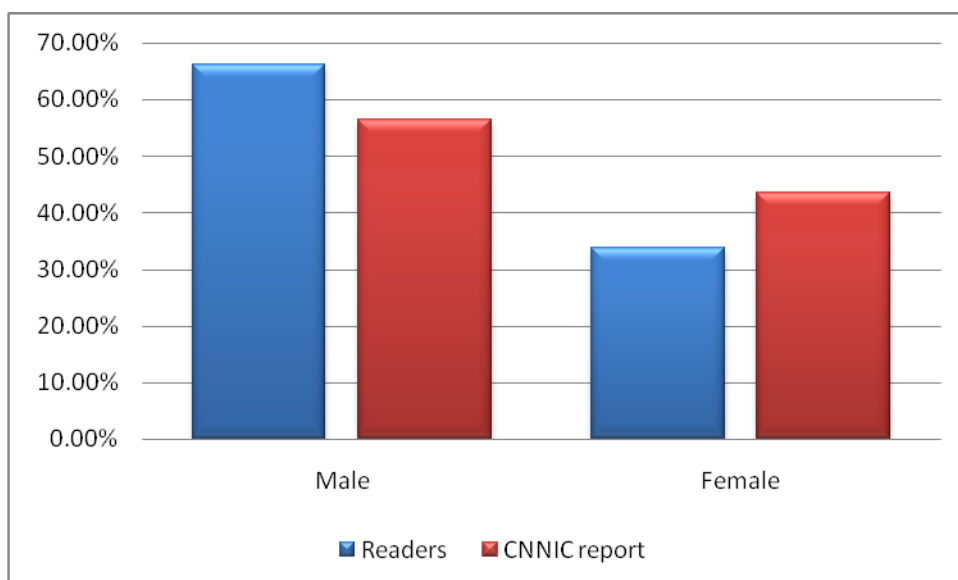


Figure7: the comparison with CNNIC report on the gender ratio

(3) Re-visiting ratio

The average re-visiting ratio of male is **986.26%**, and the average re-visiting ratio of female is only **544.56%**. It indicates that the male readers have more motivation than the female readers to use the digital reading rooms.

(4) Average using time

There were no significant differences in average using time of different gender. It is about 79 minutes every time for male, and 78 minutes for female.

3.3 Time

According to the login and logout time we could grasp the rules of readers to use the digital reading rooms. Figure 8 shows the Changing Curve of the quantity of the readers of by age groups in 24 hours.

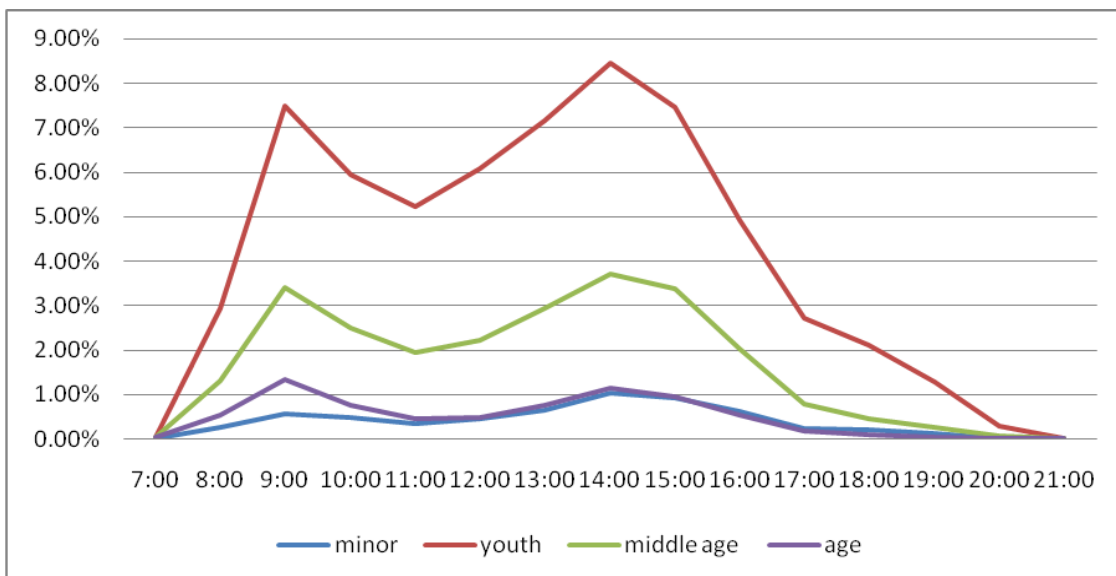


Figure8: the changing curve of the visiting of the readers in 24 hours

Figure 9 shows the Changing Curve of the quantity of the readers by age group in every week. We could find that it is mainly concentrated in weekend for youth to use the digital reading rooms, while there is no significant difference for middle age and age.

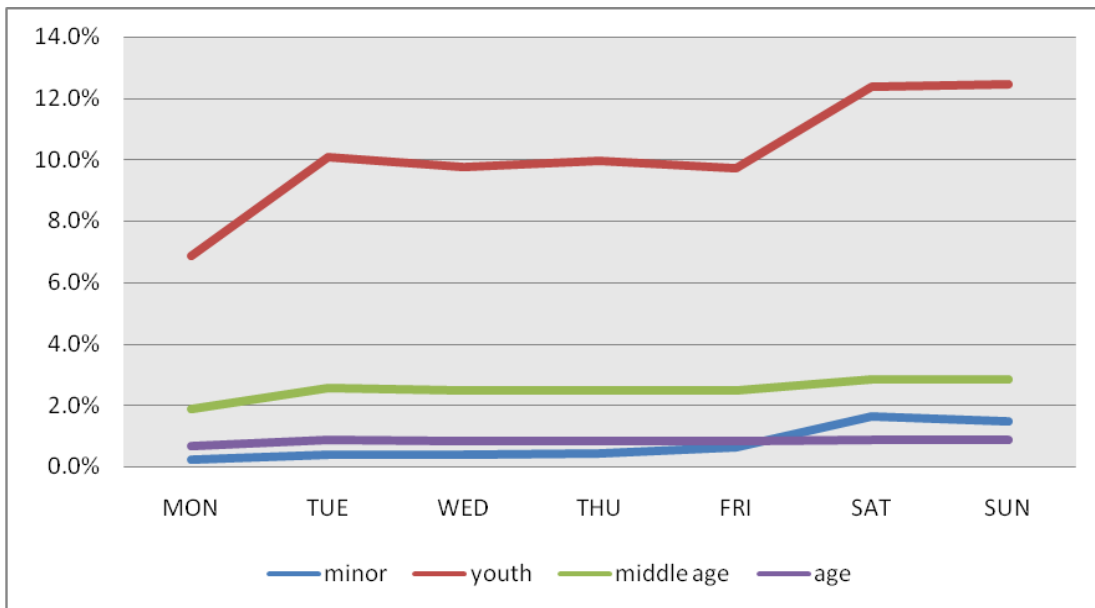


Figure9: the changing curve of the visiting of the readers by week

4. DISCUSSION AND CONCLUSION

The public library is the key component of the public culture service agencies in China. Providing non - profit public welfare service for the public and supporting the disadvantage groups are the most important functional positions of the public libraries. The digital reading rooms of the public libraries are considered as an important means to improve the digital literacy and to guarantee the basic digital right for the public in the Internet era, especially for the disadvantage groups.

From the statistic data and the analysis results, we could find that the digital reading rooms have done well for the old people. But, the ratios of the children and women are comparatively low in nearly all aspects above, expect for the average using time for women. So the public libraries should further improve the service quality, and provide more convenience for the disadvantage groups, so as to achieve the goal of “No-one left behind”.

As an analysis report based on the sample data, the quality of data always is the key of the study. Here we should discuss some aspects about of it.

4.1 About the sample

Differing from many sample studies, the sample digital reading rooms of this report are not selected beforehand, but from many candidates which had been recording the service data for a long time. And all of the data is extracted from their historical database. So, the result is more credible, because the sample digital reading rooms would not do any adjustments for this study.

But, from a more macro perspective view, it is not enough to study the behaviour characters and the needs of the readers, and to deeply understand the service laws of the digital reading rooms. We need to collect and collate more data for more long time and more candidates. By now, we have had the ability to collect the service data of over 1000 digital reading rooms. In the future, we will take 2 or 3 years to get to obtain the service data from the digital reading rooms as more as possible.

4.2 About the study fields

In this report, we mainly focus on the three aspects: age, gender and time. But, during the course of the study, we also had paid attention to the readers' educational background, the different contents concerned by different people, and the influence of the conditions of the equipments and geographical position of the digital reading rooms. But the sample variance is not very well, due to the lack of the sample data.

4.3 About the accuracy

All of the sample data of this report comes from the information management systems of the digital reading rooms. This kind of data collection provides a great convenience for the study work. But we should also pay attention to some potential problem about the data accuracy, such as the inaccuracy of the children information. The children are usually accompanied by their parents when they are using the computers of the digital reading rooms, so the registration information is often their parents' info rather than their own. It is impossible to solve this problem by the information technology ways. So for the future study, we will fix some sample data, according to the results of the manual verification.

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