

Real-time Chart System of Table Tennis Tournaments on the Internet

Yukihiko Ushiyama¹, Tohru Tamaki², Hisato Igarashi¹, and Osamu Hashimoto¹

¹ Institute of Humanities, Social Science and Education, Niigata University JAPAN

(Tel : +81-25-262-6395; E-mail: ushiyama@birdie.ed.niigata-u.ac.jp)

² Graduate School of Engineering, Hiroshima University JAPAN

Abstract: The authors have developed a real-time tournament charts system. Owing to this system, working time and task are drastically improved and people can see the results of match immediately on the JTTA web-site. This system has been used in Japanese National Table Tennis Championships successfully since 2004. This paper describes the method and advantageous effects.

Keywords: Tournament chart, Internet, TeX

1. INTRODUCTION

In various sporting events knowing the results of the games is of importance not only to their participants but also to those who have great interests in the sports. Moreover, it can be of their vital concern to obtain the results of the games in real time.

The use of the advanced information technology system in sports forces us to work promptly and elaborately when entering, drawing, and calculating data. Furthermore, the development of computer networks which connect computers with each other has brought us greater opportunities to share information than ever before. Under the environment of the world wide network, the usage of computers and the quick and global delivery of information have changed dramatically.

The users of WWW(World Wide Web) can obtain the information they want simply by clicking a mouse on a computer without recognizing where the information is stored. In other words, the demand of the Internet has increased just as it has become easy and quick to obtain any information. Though it is now popular to deliver the progress and results of the games, not all the sports are intended to apply the network technology. Only those sports for which it is considered to be potentially beneficial make use of this technology. One reason for this is that entering data requires assigning many staff, thus, increasing personnel costs.

In sporting events, many staff members and officials are involved. For example, the number of such people is a few thousand in a big event like the world table tennis championship. Some of them, for example, official scorers must be permanently stationed in order to do their job rightly. Thus, these people can directly receive the benefit from employing the computer system which we have developed in this study. Additionally, the results of the games can be delivered in real time to those who are eagerly looking forward to having the results of the games.

2. PURPOSE

The ways publishing game results differ from one sport event to another, and depend on the kind of tournaments or events of a specific sport. The purpose of this study is to evaluate the system which has been developed to draw the real-time tournament charts and

to deliver them automatically based on the database for the 2004 Japanese National Table Tennis Championships. This event is hosted by the Japan Table Tennis Association and takes place once a year.

3. Japanese National Table Tennis Championships

Japanese National Table Tennis Championships is the largest and the most prestigious tournament in Japan. It is held for 6 days in mid January in the Tokyo Metropolitan Gymnasium in Sendagaya, Tokyo. This tournament consists of 7 events, including "Men's Singles," "Women's Singles," "Men's Doubles," "Women's Doubles," "Mixed Doubles," "Junior Boys" and "Junior Girls." Managing table tennis tournaments is not an easy task due not only to the nature of this sport but also to a large number of participants playing more than 300 matches a day. When the tournament charts of 27 events are shown in a booklet, they need more than 33 pages.

Traditionally, the game charts were made by hand and therefore, that work was very laborious and time-consuming. There have been strong demand for computerization of the game charts for many years. Responding to such demands, authors' group has been engaged in development of computer system for the purpose. Finally we succeeded in developing a real time chart system. Our computer system is quite effective in providing real-time charts and delivering them automatically.

4. METHOD

The rapid communication system for real-time information for the National Table Tennis Championships was developed at Niigata University and has been used since the 2000 National Table Tennis Championships. Entering each athlete's name, affiliation, his/her prefecture, athlete code and match code, we can retrieve and display the results of the games immediately on the system.

By using a database, we set up the initial picture of real-time charts of the tournament. After that we run the computer programming for information

delivery system.

To draw tournament charts, we installed VineLinux 3.0 (Kernel Version 4.2.26-Ov115) on the PC, IBM Net Vista, connected to the Niigata University LAN. We utilized LaTeX to generate the charts on the PC automatically. Furthermore, to display the charts on JTТА's web site, we applied the PDF (Portable Document Format) format, a commonly used format to show the images on a browser.

During the tournament, Mozilla Firefox (Version 3.5.3), an application software for the internet display, was utilized to display the results of the games. In order to rewrite the HTML files after each match result was obtained, we needed to program the CGI. In this study we chose the Perl language for CGI programming because it is suitable for CGI programming and also is independent from other types of computer and binaries.

Perl dealt with drawing the tournament charts and implemented algorithm for displaying standings and then returned the source of LaTeX. After DVI File was written, it was transformed into PDF File with dvi2pdf. As for editing the data and programming the source codes, the text editor Emacsf (Version21.3) was used. The work flow in drawing tournament charts is shown in Figure 1.

5. THE DATABASE OF MATCH RESULTS AND THE FLOW CHART OF COMPUTER PROGRAMS

The conventional system which has been used in most of table tennis tournaments in Japan carried out only the delivery of match results, but the new system which we have developed deals with the draw of the tournament charts as well. The database of match results shown in Figure 2 was arranged in such a format that viewers to find the match results through a browser.

The flow chart in Figure 3 shows the programs for generating the source code of TeX file in order to draw the tournament charts.

6. PUBLICATION OF TOURNAMENT CHARTS ON THE INTERNET

A separate computer "eagle.ed.niigata-u.ac.jp" was required to draw tournament charts due to the expected high demand of access to the server www.jtta.or.jp during the tournament. The former was located at Niigata University and was needed to exchange the information with the server at JTТА in Kishi Memorial Gymnasium through the Internet. Thus, ftpmirror1.21, a software package for forwarding files, was installed in eagle to draw the charts and exchange the information with the server. Both the execution of the program for drawing the charts and the exchange of the files were done every 5 minutes through employing the cron daemon on Linux OS, a software for the auto-command function. The terminals on which the results were entered were located at the tournament hall at Tokyo

Metropolitan Gymnasium in Sendagaya: the open server and the computer for the tournament charts, eagle, were provided with by Niigata University. The data flow among JTТА Web Server, eagle, operator and viewers on the Internet are shown in Figure 4.

7. ACCESS COUNT FOR JTТА WEB SERVER

Access to <http://www.jtta.or.jp/> in 2004 increased by 24.6% compared with that in 2003. The change in the number of hits between 2003 and 2004 is shown in Figure 5.

Apparently, the introduction of the real-time tournament chart system in 2004 resulted in an increase in the web visitor count from 2.49 up to 3.10 million or by 25%, and a similar increase in the chart viewer count from 3.31 up to 5.63 million or by 70% in a year. On the average in 2003 a visitor to the JTТА web site viewed 1.33 static tournament charts while in 2004 a single visitor to JTТА viewed 1.81 dynamic tournament charts.

8. CONCLUSIONS

The tournament charts for all events result in more than 33 pages in the booklet at the annual Japanese National Table Tennis Championships. Before the present system based on PC and network was completed in 2004, much time and laborious work was required to complete the draw procedures. It took even for experienced tournament staff dozens of working hours not only to draw the charts but also to enter the scores and other results. Those days it was out of the question to deliver tournament charts to viewers in real time. We succeeded in developing the real-time tournament charts system on the JTТА web site in 2004. Our system has now attained the following significant goals:

1. to reduce the number of the staff required to draw the charts.
2. to eliminate the time required to draw the tournament charts (30 hours to 0 hours).
3. to deliver the tournament charts immediately on the Internet (every 5 minutes)
4. to let the viewers comfortably browse the match results and the tournament charts at their convenience.

REFERENCES

- 1) Akimoto S, Furukawa T: CGI Kisokouza, ShoueiPublishing Co., 1999
- 2) ASC Editorial Dep. Henshuubu:Meikai LaTeX Reference, ASC Publishing company, 1995
- 3) B.W., Kernighan D.M.Ritchie :Programming Language C, Kyouritu Publishing Co, 1989
- 4) L. Wall, R.L. Schwartz: Programming Perl, SOFTBANK Corporation, 1993
- 5) Masui T: Perl Shohou, ASC Publishing company, 1993
- 6) Ushiyama Y, Ohtaki K, Igarashi H: The Web Site of the Japan Table Tennis Association, TABLE TENNIS SCIENCE, No.4&5, pp206-219, 2004

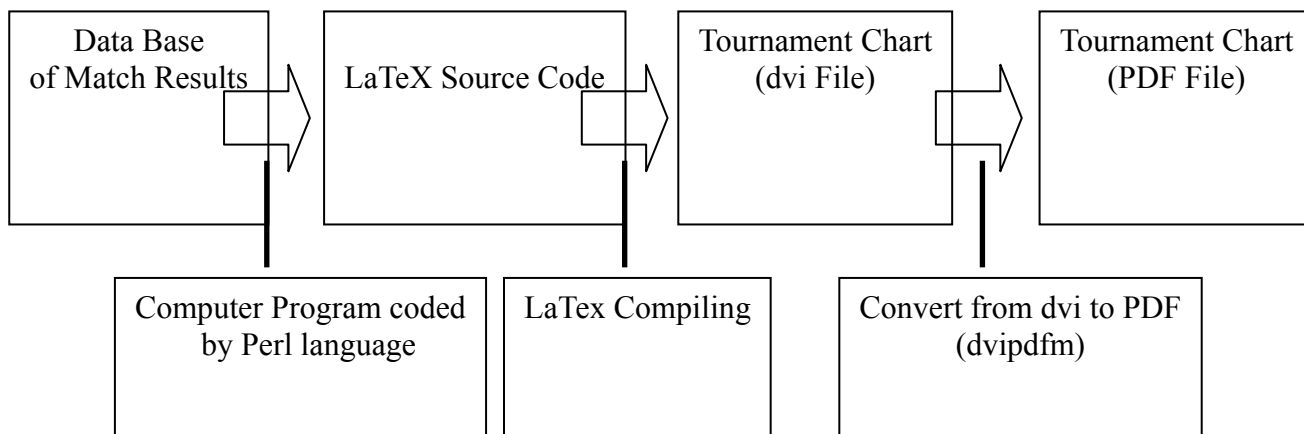


Fig.1 Flow of Drawing Tournament charts

The File format of the Data Base

Match No.	Match or Player No.	Match or Player No.	Winner	Points
MS001	2	3	0	5,-10,4,3
MS002	4	5	0	8,8,-8,-7,2
MS003	8	9	1	6,9,6
MS004	10	11		
MS005	1	MS001		
MS006	MS002	6		
MS007	7	MS003		
MS008	MS004	12		
MS009	MS005	MS006		
MS010	MS007	MS008		
MS011	MS009	MS010		

The internet server of JTTA that provides the match results shown above

Web Browser that enables viewers to obtain the match results

Fig.2 Match Results Database

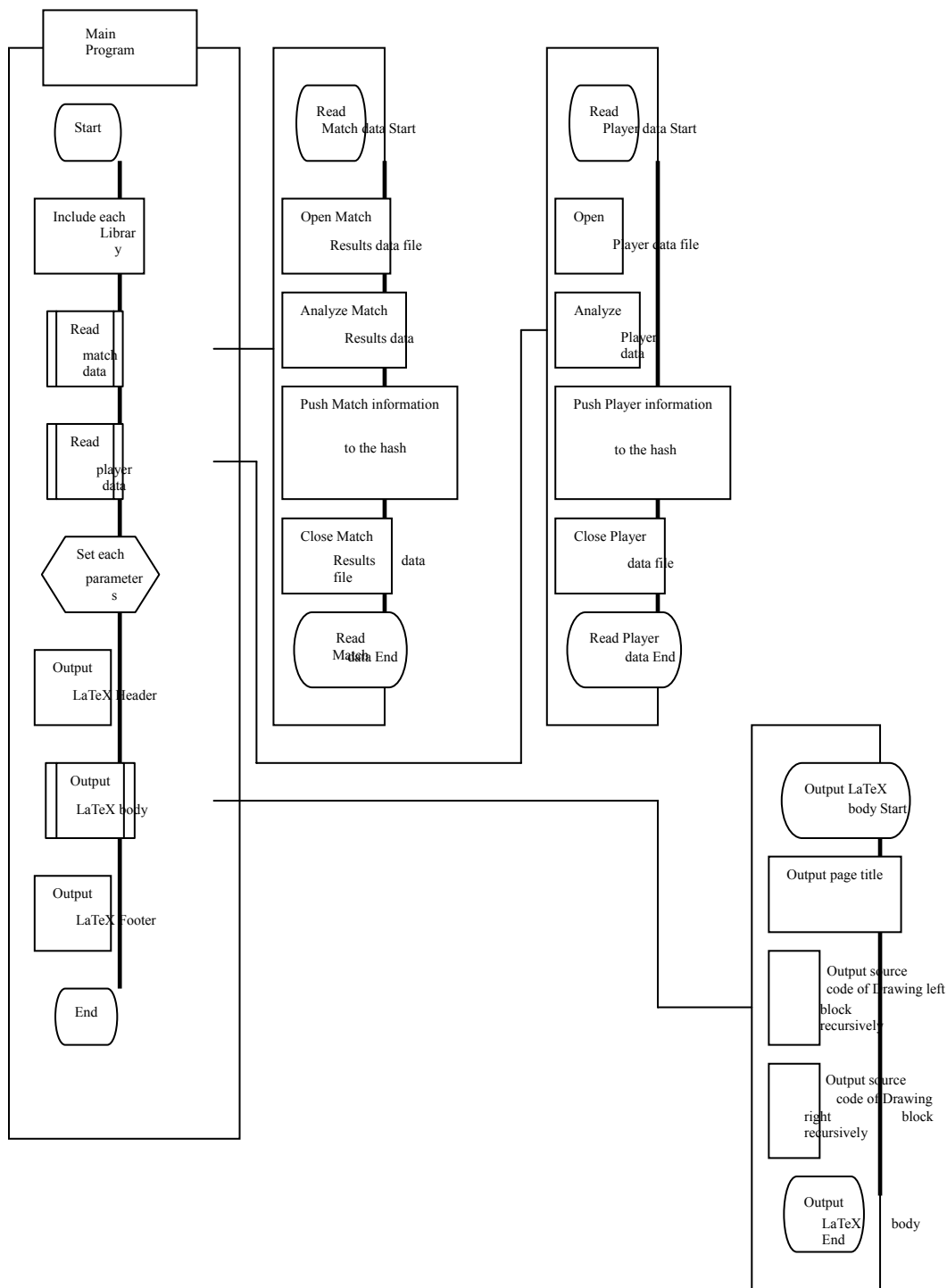


Fig.3 Flow Chart of the computer Programs

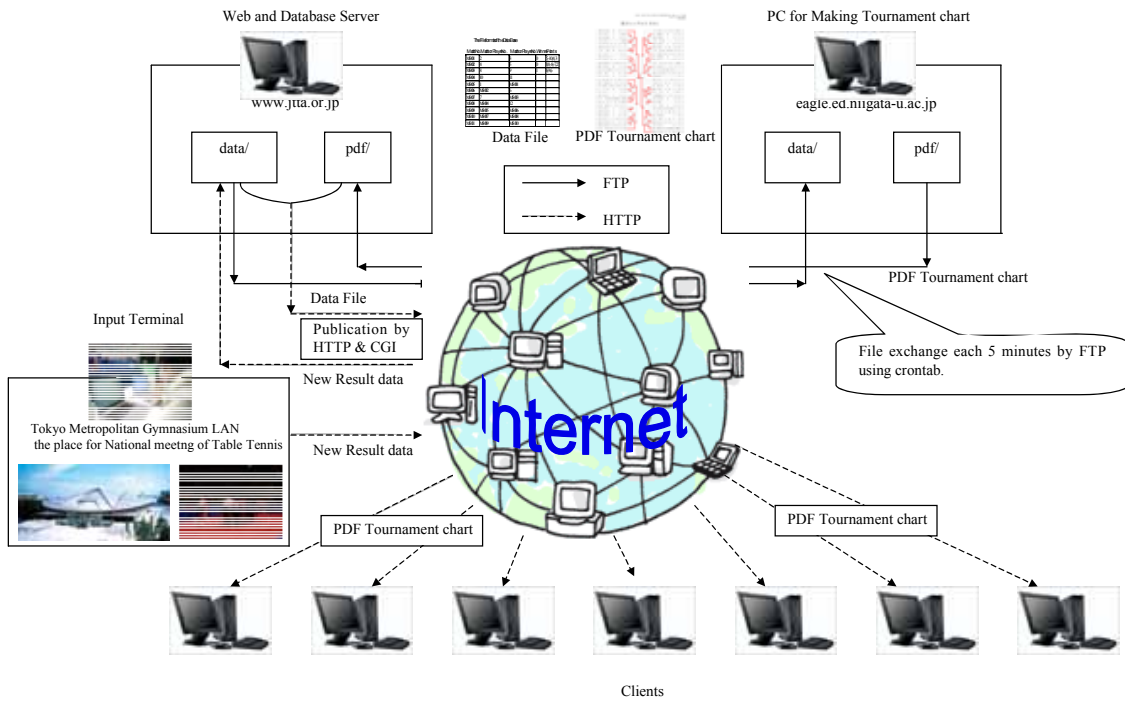
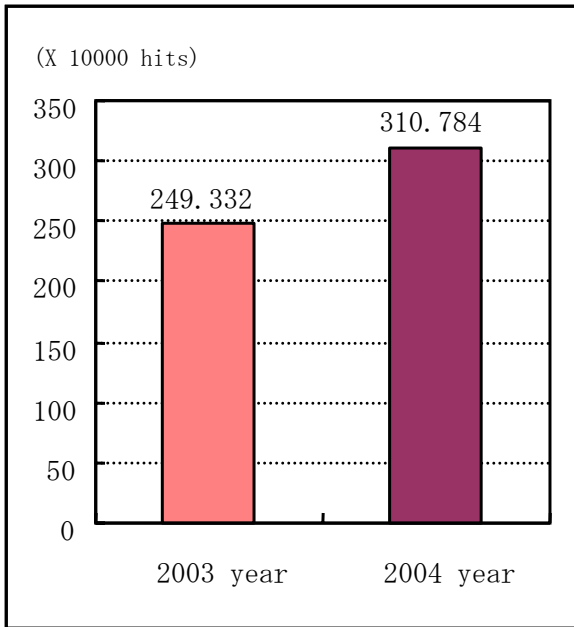
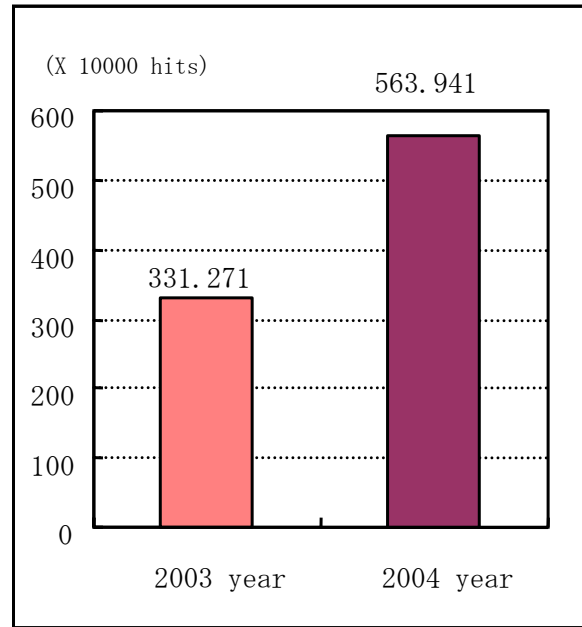


Fig.4 Data Flow on the Internet



a) Hits for web site



b) People viewing the tournament charts

Fig.5 The Difference in the Number of the Hits between 2003 and 2004
Real-time Tournament chart system was not **available** in 2003.