

Study of College Sports Venues Management based on “Internet plus”

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Abstract. Using literature research method, empirical approach, and numerical comparison approach, situations of college sports venue usage and management were surveyed and analyzed. Taking Nanjing Institute of Railway Technology as a case, a management system based on the concept of internet plus and Browser/Server mode was exploited and put into operation. The operation data of sports venue before and after using the system was obtained. By comparing and analyzing the data, we found that the management system was helpful for making full use of the sports venue, besides, the exercise enthusiasm of students increased significantly.

Introduction

According to “The 37th China Internet Network Development Statistic Report” published by the China Internet Network Information Center(CNNIC), up to December 2015, the population of Chinese Internet users had reached 688 million, among them 620 million internet users are mobile phone subscriber; and Internet penetration had reached 50.3%, among which 90.1% internet users go online using their mobile phones. In a word, half of Chinese people had accessed to the internet^[1]. Internet plus action plan was first proposed by premier Li Keqiang when delivering the people’s Government Report 2015^[2]. The action plan will integrate mobile Internet, cloud computing, and big data with modern manufacturing, which will bring more opportunities for college physical education reform. According to the 6th national sports venues survey, the sports venue area in China had reached 1.992 billion square meters, 53.01% of which dated from education system, and the sports venue area was 0.1056 billion square meters^[3]. Meanwhile, facing to a series of problems, such as, financial difficulties, potential safety hazard, and so on, the opening rate of sports venue area in education system is low^[4-8], which avoids students and other social people making full use of sports venue and equipment.

To increase utilization ratio of sports venue in colleges, we firstly used literature research method and survey-based approach to master the operation mode of sports venue in some colleges of Nanjing City. Secondly, we carried out a case study of Nanjing Institute of Railway Technology using empirical approach. Based on the concept of internet plus and network informationization, a sports venue management platform was established, the variation of utilization ratio was discussed.

Approaches

Literature research method. We analyzed current situation about sports venue management of colleges through consulting a large number of research literature.

Survey-based approach. We searched successful case about sports venue management at home

and abroad on line. And then we went field trip to various universities and colleges in Nanjing City to get acquaintance of their management situation.

Panel discussion method. We held small meetings and invited experts to discuss the situation and shortcomings of current management situation about college sports venue, and then put forward systematic solutions.

Empirical approach. We realized some solutions through the intelligent information-based system based on the concept of internet plus. And then we carried out the set of system in Nanjing Institute of Railway Technology to manage the sports venue, including badminton gymnasium, table tennis training hall, basketball court, tennis court and so on.

Numerical comparison approach. In the process of empirical validation, we collected a large number of operational data of sports venues at different stages. Then we made comparison between the stages before and after the use of the management.

Platform Construction

The sports venues management platform of Nanjing Institute of Railway Technology was constructed based on Browser/Server^[9-11]. Through websites, the users could maintain their personal information, inquire venues information, and book venues. The administrators could manage venues and information about users through internet. The platform was systematically designed according to the principle of hierarchy. The design of platform was based on modularization and plug-in method to realize system function configuration and extend system function based on the actual needs of the situation. The overall system diagram of platform construction is shown in Fig. 1.

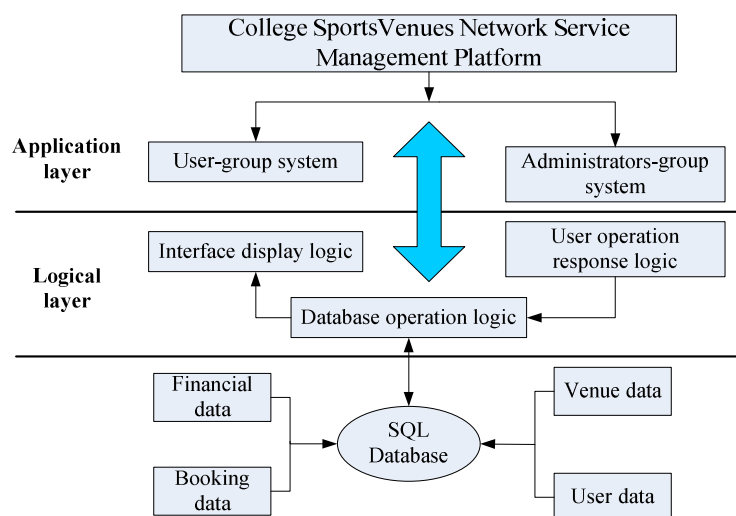


Figure 1. Overall system diagram of platform construction

The interface of sports venues management system is shown in Fig. 2. There are six main functions in this system: membership consumption, membership management, remind reservations, statistical statement, system settings, and association management.

Besides, to encourage students to take part in morning exercises, an attendance management system was exploited to keep records of the times. The interface of the attendance management was shown in Fig. 3. Everyone of the students had one IC card, and they swap the cards before they took exercise every morning. There was information about student names, numbers in these card. At the end of term, the students who took exercise the most times would obtain special awards.

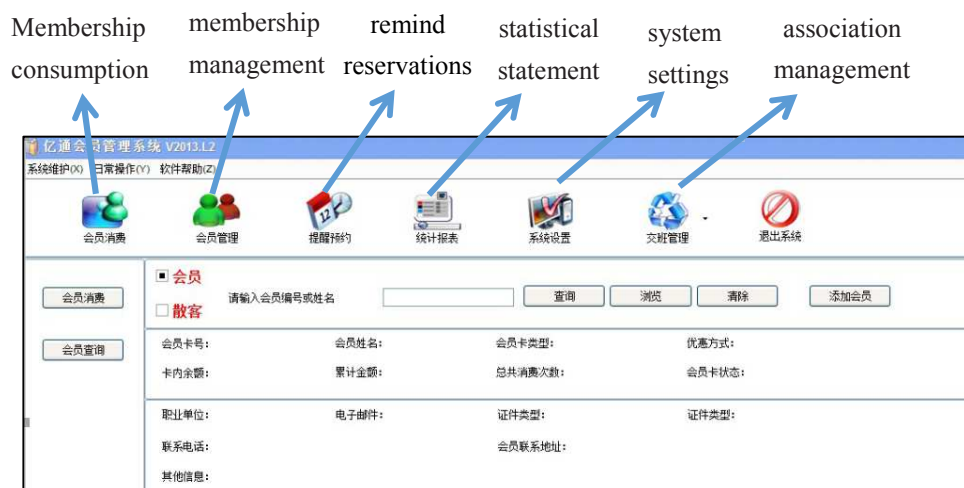


Figure 2. Interface of sports venues management system

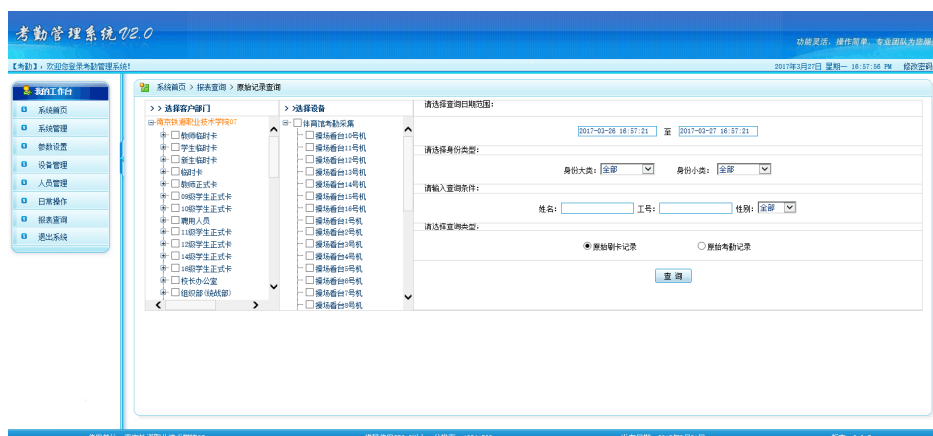


Figure 3. The interface of the attendance management about doing morning exercise

Results Analysis

The information transparency, time-consuming of booking sports venue, financial management style, and morning exercise attendance rate before and after the using of platform were obtained by a series of surveys, and the variation was discussed using numerical comparison approach. The information transparency about the sports venue before and after the using of platform was shown in Table 1.

Table 1 Comparative data of information transparency about the sports venue

	number of introduce words about venue	number of on-line photos about venue	transparency of fee standards	number of present person
before the using of system	30,000	10	100%	realtime monitor
after the using of system	2,000	300	80%	non-realtime monitor

From Table 1, it could be found that the intelligent platform increases the information transparency significantly. First of all, the sports venue management system acts as an advertising

platform, so the number of introduce words and on-line photos about sports venue increases, which make students get more knowledge about sports and venues. Secondly, the transparency of fee standards increases. Before the using of the intelligent system, 20% of the users did not know the time they took in exercise, nor the price per hour of the venue. With the help of the intelligent management system, they got receipts which showed the start time, the ending time, and the price per hour when they left the venue.

The time it took for booking sports venue and the queuing lengths before and after using the system are shown in Table 2. Before using the system, most of students booked sports venue by mobile phone and it took 3 minutes for every person. After using the system, the time was shortened to 40 seconds, which increases the booking efficiency. The average queuing lengths before and after using the system are 11m and 5m, respectively, and the average numbers of queuing persons per day before and after using the system are 62 and 15 persons. Due to the higher information transparency, users could get knowledge about real-time usage status of sports venue, which avoided the unnecessary queuing significantly.

Table 2 Time of booking sports venue before and after using the system

	average booking time	average queuing lengths	average number of queuing persons/per day
before the using of system	3 min	11m	62
after the using of system	40 sec	5m	15

The financial management style before and after using the sports venue is shown in Table 3. The accounting style and payment method before and after using the system changed obviously. Before using the system, handwriting was the main style for accounting, which is unsafe and difficult for searching. Automatic input was applied instead of handwriting, which made the information security of users more reliable. After using the system, there were receipts offered to users when they left, so the users could know their consumption clearly. Besides, the attendance rate of morning exercise increased from 70% to 98% after using the attendance management system, which motivated students to do exercise more actively.

Table 3 The financial management style before and after using the system

	Accounting style	Payment method	any receipts
before the using of system	handwriting	cash	no
after the using of system	automatic input	cash and on-line payment	yes

Conclusion

In this paper, an intelligent sports venue management system was exploited and applied in Nanjing Institute of Railway Technology to optimize the usage of sports venue. This intelligent platform is based on the concept of internet plus and Browser/ Server mode, which increases the information transparency and the usage rate of sports venue significantly. The sports enthusiasm of students were motivated efficiently, and the attendance rate of morning exercise is more than that before

using the platform. So it is a successful case for the efficient management of college sports venue and it is potential for widespread application in various colleges.

Acknowledgments

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