Automatic Stadium Reservation System In Universities Based On Number Of Students In Each Department

Thikra Mohammed Ali [1] & Yusra Sabah Mohammed[2] & Huda Abdulbasit Abdullah[3] & Muhammed S. Anwar[4]

[1]Accounting Department, Adminstrative Sciences and Economics Faculty, Tishk International University, Erbil-Iraq.
[2,3] Independent Researhers, Erbil-Iraq.
[4] Computer Education Department, Education Faculty, Tishk International University, Erbil-Iraq.
Correspondence: Muhammed S. Anwar, Computer Education Department, Education Faculty, Tishk International University, Erbil-Iraq.
Email: muhammed.anwar@tiu.edu.iq

Abstract : In the 21st century the role of computerized system becomes essential in booking systems. for sport facilities that want to succeed in today's competitive environment, must use information technology to manage their reservations effectively. The reservation of stadium in Tishk International University go through a complicated process since everything is done manually. And students reserved stadium through stadium managers. The Stadium Management System is a software or online solution that is developed to help the students in any department to reserve the stadium online and in a fair way and to help the stadium management staff to have clear observation of overall stadium utility also the students are able to communicate through a chat system that have been designed throughout this research to help them to find opponent team or if they need any extra player. In the Stadium Management system, the users are divided into two main types according to their position which are admin and representative. Each user has access to different pages and functions according to their position, which are assigned and controlled by the admin. This system will overcome the manual reservation of the stadium and it will eliminate the available conflicts between departments.

1. Introduction

The number of web system development has been expanding as the Internet and intranets have become more widely used. Many firms have progressed from manual to computerized systems in recent years. In the last ten years' reservation of stadium in Tishk International University go through a complicated process since everything is done manually. The TIU stadium management system is a web system used to reserve the stadium by classes and departments in Tishk university. In this project we will try to eliminate the conflict of booking stadium between departments. And finding solution for the problems that facing stadium management. This research will change the existing approach for managing stadium bookings to an electronic one to eliminate difficulties. Stadium Management System contains a user-friendly interface that provide viewing schedule of weekly games. At the TIU, each department counts as a team, and students can reserve the stadium and play through their departments. Based on the number of students in each department number of booking the stadium will change in a week. And this reservation will be done by representative of departments.

The reservation of stadium in Tishk international university has been done till now manually. Until now, the students have reserved stadium through stadium manager, and this has caused conflict between departments, which more than one department reserve the stadium at the same time and, in some other times the stadium is empty, and the stadium does not reserve by any apartment. TIU stadium reservation website will rearrange the schedule of booking stadium by departments and giving them equal opportunity to reserve the stadium.

The aim of this project is to provide and design an automatic reservation system for university stadium and giving them opportunity for all the classes and group to reserve stadium according to the number of students in the department then in the class and using the chat system to notify the other group if any team needed opponent team or a player.

Also, the main goals of this project are:

- To develop an automated system for reserving stadium in Tishk international university
- To provide a system that can control the stadium reservation based on the number of students in each department.
- To schedule the stadium timetable in a fair way.

To create chat system to communicate with other teams or players, which helps them to notify the other group if any team needed opponent team or a player.

2. Literature Review

When it comes to infrastructure and administration of sport facilities, the world of sport has grown tremendously in recent years (Ugwueze, Stacey Adanna, 2018). Computer systems are now used to organize it. As a result, there will be a reduction in the number of needed people to run different systems inside the company. One person may be all that is required for a company to run a system. In addition, technology saves individual's time by allowing them to record data electronically rather than manually. So, to make meetings and appointments easier, several businesses have implemented an online appointment system (Zulkifli, 2020). Computerization is the development of a new system based on computer technology for input, output, processing, and archival purposes. The paper-and-pencil method has been completely replaced with a computer system. To be considered "computerized," one must not include just the hardware and software components of a computer, but also how people may communicate with one another and exchange information, both locally and internationally. (Amanze B.C, Ononiwu C.C, Nwoke B.C, Amaefule I.A, 2015)The capacity of computers to process enormous volumes of data or even perform difficult tasks at a rapid pace (the processing cap ability) has led to their replacement of manual technology, according to Oparah & Oguike (2006). (Oparah, C.C & Oguik, O.E, 2006)

In these past years, a lot of people has created reservation system. in this section, many people's work and existing system, which is used for sport complex reservation will be mentioned.

The table tennis hall is used at Zhengzhou University as a model for an online booking system for university sports facilities. User registration and login, area booking, payment via credit card and personal center are only some of the system's core functionalities that are intended to meet the needs of the general user population. Online booking for university sport facilities have been fixed, allowing for more effective use of the facilities, and meeting the demands of more people. (Can Li*, Junjie Li, Hongxiang Cao and Zhan Meng, 2016). A smartphone application with functionality for online sport

field rental bookings and real time scheduling for each customer was built as part of this project. The app can help the community and the general public, especially ball sport fans, make field reservations without having to physically visit the location. Rental services for sport fields, such as football and basketball fields, are offered through the application. (Tonto Claudinus, Made Prayoga Wicaksana, Nicolas Kornelius Sitorus, Marsa Ariqi Gustiandza, Tanty Oktavia, Ford Lumban Gaol, Takaaki Hosoda , 2020). In the (Zeyad M. Alfawaer, Mohammad Awni, Saleem Al-Zoubi, 2011) study a mobile ticketing system for the Amman International Stadium in Jordan presented that gives fans an E-ticket so they can watch games without wasting time or effort. This is simple approach to make a reservation for a football event is provided by sample by offering the public with information about tickets and allowing them to reserve seats. A thorough testing and assessment has shown that the sample is up to mobile users' standards.

According to (Collins, 2011) project ticketing system has been developed for both Swansea City FC and Ospreys Rugby Union at the Liberty Stadium. With this project, we wanted to make it as simple as possible for clients to buy the tickets that they want. And to develop a match-by-match cost-saving entrance method to the stadium that is more efficient and contemporary. For the sake of equitable ticket distribution for away games. In the end, this research led to the development of a web-based system for liberty stadium that eases the process of reserving match tickets online, and even allows supporters to buy season tickets online.

This study presented here focuses on the development of Android-based sports arena ordering apps to aid community futsal activities in Jakarta. This software makes it easy for individuals to get information about the sports arena and to order sports fields at any time. This application provides information about the sports facilities that the customer wants, such as what time the sports field is free, how long they want customers to rent the field, and customers can also book without having to come in person to the location, so that they can save time and money. (Farel Darari Deksano, Dimas Raka Erfiandhi, Anggy Cahya Prasetya, Aditya Satria Nagara Patmuryanto,, 2021). And another Booking system Sport & Recreation Centre (SRC) has been utilized by the National University of Singapore (NUS) (SRC). NUS uses this website to make all its sporting facility reservations. At the end, the systems' users must be university employees or students. The SRC system can prevents non-students from using the university's athletic facilities and it is solely open to students and faculty at the institution because someone takes over the sport facilities. This approach can avoid conflict or dispute. (Sports Facilities, n.d.).

Hong Kong Polytechnic University has an online booking system for its sport facilities, and all reservations are made via the website. The university's faculty and students as well as their close family members and alumni are the primary users of these systems. To prohibit students from outside the institution from renting the university's sports facilities, (Online Booking, n.d.). The Institute of Human Performance (IHP) online booking system is used by the University of Hong Kong (HKU) to manage their daily bookings for sports facilities. It is an online booking system for HKU's sports facilities, and all bookings are made on the website (HKU portal). Only HKU personnel and full-time students who have an IHP sport membership (principal cardholders) are allowed to utilize these systems. (HKU PORTAL, n.d.).

Sports & Recreation Centre Online Booking System has been adopted by Nanyang Technological University (NTU). Every reservation for NTU's sport facilities is made through the website. To utilize these systems, only full-time employees and students who have paid the yearly sports fee for this

institution are allowed to access them. This approach is designed to keep university sport facilities from being used by non-students. (Welcome to Sports & Recreation Centre, n.d.)

The Keele University has utilized a system called Sports Centre Online Booking System to reserve sport facilities. It is an online booking system, and all bookings are made via the website. The university's employees and students must be the primary target user for these systems. The advantages of using the Sports Centre Online Booking System include the ability to book at any time of the day or night. It is solely open to students and faculty at the institution. (Online Booking, n.d.)

3. Methodology

The issue statement which was mentioned in the first chapter can be solved by providing an website. For this purpose, actions were needed to start accordingly to plan the phases as shown in figure 1.

Planning and Collecting Requirments	
Search for existing systems	Outline of the website

Designing
Designing the Website

Coding	
Develope the Main, Register and Login Activities	Developing reservation and chat system

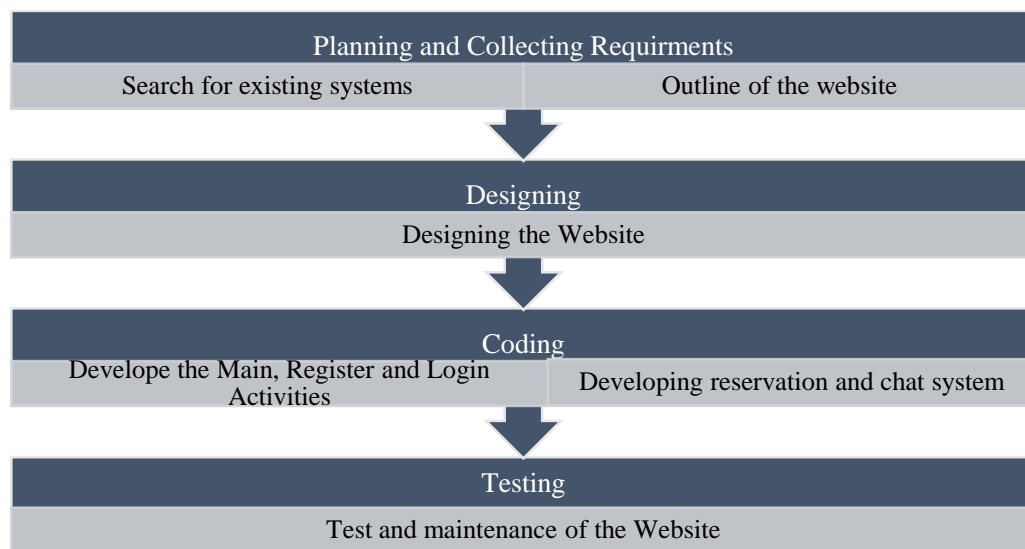| Testing |
| --- |
| Test and maintenance of the Website |

Figure 1: Phases of creating stadium management system

The first step was to search for existing reservation management systems and to gather information on how to create a dynamic system, which technology, and language to use and what should be included in the system in order to make it more efficient. The next step was designing and planning the outline of the website to simplify the process of development. Then, HTML is used for building the structure of the website and the style is given by CSS and Bootstrap. Next, backed of the system has been developed. The online system has three main types of access which are system Admin, representative of students, and students. The admin is the Dean of Student and has full authorized access to all the pages and student accounts. They can edit, delete, and view information of each user and can modify number of students in each department. Also, they will create account for representatives. The representative of students can access to the reservation page and reserve the stadium for their department, Also, they have ability to make announcement to notify the other group if they need opponent team or a player. Students can see the schedule of the games and use a chat system for replaying announcement. When representative want to book a stadium, the reservation will change based on number of students in their department. The time of reservations has divided into two sections. The first section starts from 3 to 7 P.M. And the second section starts from 7 to 11 P.M. If a department which its students' number are less than 50 then they can reserve the stadium once a week in the section that they desire. But if the number of students is more than fifty then they can reserve

the stadium twice, once in the first section and the second time in the second section. These actions and features mentioned in this chapter are being performed by using PHP, JavaScript and JavaScript libraries like JQuery. Finally, the whole website has been evaluated to make sure that everything is working correctly.

4. Results and Desiccation

TIU Stadium Management System contains different pages, these Pages Are Administration, Representatives and Students, In addition to the Login, Dashboard and the profile pages. Database used to store all the information related to the Representative, students, reservations and etc. The data that is stored in the database contains information regarding the representative personal information, number of students in each department, each departments reservation requests the stadium, announcement regarding the need of players in a team in the chat system and… etc. In the Login both admin and representatives can log into their account for admin to be able to add new representative of a department and for the representative to reserve the desired hour for the department. The user needs to enter their username, password, and type of there account. For the representative account type to be able to use the system the account must be created first by the admin. Then the representative can use the system to reserve the stadium else no student can access the reservation part to modify.

The administration section accessed only by the Dean of Students Unit. It contains several pages which are responsible for entering basic data including the university departments, department representatives, reservation details, and making announcements. After admin enter all department, the system will use the data of department page to create a list of departments and display it when adding new representative for the available as shown in figure 4.5. The department is also one of the elements that is used in the reserving stadium which will be explained in stadium reservation section.
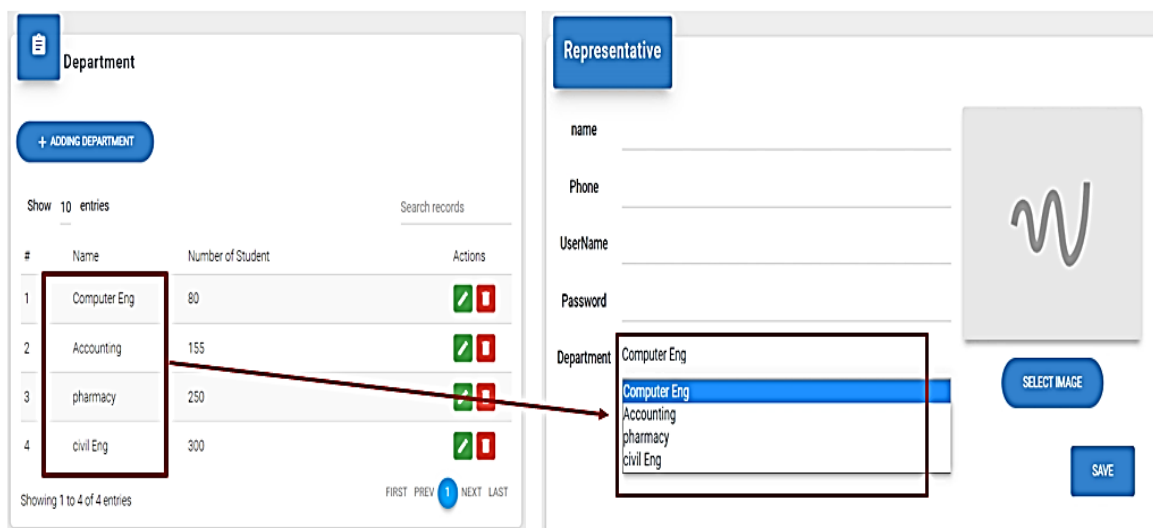

Figure 2: Department list in adding new representative.

Also, Admin can assign representative for each department and create a new account for them, Since the representative logs in with their username, the username given by the admin to any department representative must be unique to prevent any kind of confliction. The text field of each form has been validated, when entering the username, it will first check if this username already exists in the database, if yes, the admin cannot submit the form and a pop up message will be shown to the admin with the

error message. And, Admin can see all the details of reservation, which reserved by the representative of a department, the admin can delete the reservations while no one has able to delete them.

The Representative section can be access only by those representatives that the admin creates account for them. They are responsible for booking stadium for their department and making announcements. The reservation will be done only by representatives of each department, he can see the weekly schedul of the stadium and in which time/day stadium is empty or not as shown in figure 3. Those departments that they have less than 50 students they can reserve the stadium once a week from 3 P.M to 10 P.M. And those departments that they have more than 50 students they can reserve the stadium twice a week one from 3 P.M to 7 P.M and second time from 7 P.M to 11 P.M. Departments that they want to reserve more than what they deserve, the system will show them a notification that they are not able to reserve because they do not have right. and if the stadium is reserved by department in a specific time and day, other departments cannot reserve the stadium in the same day and time. Also, the Representatives of each department could make announcement to notify the students if any team needed opponent team or a player, or if the team regret to use the stadium they can announce on the chat system if any team wants to use that specific time.

Figure 3: weekly schedule of TIU Stadium

All students in Tishk International University can access to this website and view weekly schedule of games that reserved by their departments, or they can only view list of games in specific. Also, all of the students have ability to replay announcements that announced by representatives by entering their name and content of message.

5. Conclusion

The aim of this project was to provide and design a web – based management system for the stadium reservation of Tishk International University that allows them to arrange schedule of reserving stadium by departments in a fair and efficient way. The main focus was to develop a system that automate the tasks of booking stadium. As the report has demonstrated the system can control the reservation based

on the number of students in each department that will give more opportunity to the departments that have more student. Also, chat system has been developed that can be used between students. When using the system for the very first time, the admin needs to setup all the general settings from the Administration section, which are responsible for the structure of the university such as departments, representatives etc. After setting those structure the system can be fully used. The representative structure set up is responsible for booking the stadium based on the number of students in their department.

Author's Contribution

"We confirm that the manuscript has been read and approved by all named authors. We also confirm that each author has the same contribution to the paper. We further confirm that the order of authors listed in the manuscript has been approved by all authors."

Conflict of Interest:

"There is no conflict of interest for this paper"

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