

# Pura Kencana Sports Centre Management System

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**Abstract:** In most companies, the introduction of web-based management system solutions results in the simplification of business procedures. Problematic for Pura Kencana Sports Centre is the paper-based method of the management system. This increases the likelihood of duplicate bookings and lost customer information at Pura Kencana Sports Centre. To solve this problem, the Pura Kencana Sports Centre Management System was developed to manage their sports facilities, with a focus on court booking, and to evaluate the system's overall performance. The system is based on ZF2, PHP, and MySQL and uses HTML5 extensively without needing support for obsolete browsers. The Agile Software Development Model was used to develop the system. It is hoped that the Pura Kencana Sports Centre Management System would assist the customers and management of the Pura Kencana Sports Centre in gathering information, performing the booking process systematically, and being well-integrated with any payment gateway in future.

**Keywords:** Management System, Agile Development Cycle, Web-Based

## 1. Introduction

Regardless of their sector of activity, sports organizations should address the position of any other organization. This assertion is founded on management's universality [1]. Pura Kencana Sports Centre is a famous sports centre in Batu Pahat, Johor. Badminton and futsal are the most popular sports in Malaysia. This place provides high-quality rubber flooring, a well-ventilated indoor environment, and world-class facilities. Pura Kencana Sports Centre previously used a manual management system which requires a lot of work and paper and more other flaws. The proposed system was built specifically for their customers and the management of Pura Kencana Sports Centre. The proposed system will assign a unique booking ID to each reservation as confirmation of the reservation. Using this approach, management may save money by avoiding the purchase of paper since all data is saved in a database that is safe and organized. The proposed system is a web-based system which more systematic and would prevent court booking duplication.

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Numerous sports organizations have used web-based management systems to boost the effectiveness of the management process. Currently, the Pura Kencana Sports Centre has a manual administration system. The biggest problem with the previous manual system is that it is inefficient. Court availability cannot be determined by customers since there is no visible time slot available online. Customers must contact the staff by phone or message to inquire about available slots. The previous system requires considerable effort, delay, and persistence. The proposed web-based system and a database are required to effectively manage the court booking and sports equipment sales processes.

The suggested system has distinct goals. First, the development of a web-based management system for sports facilities, with a focus on court booking. Second, the suggested system would provide a web-based sports centre management system using the popular LAMP stack (Linux, Apache, MySQL, and PHP) and the sturdy Zend Framework 2. The third purpose of the suggested system is to evaluate the system's overall performance.

The importance of this project is an effective sports centre management system that focuses on court bookings. A web-based sports centre management system is the standard of care. The system implementation generates a visible timeslot. It streamlines the procedure for customers and employees to save time and make it more user-friendly. In addition, the web-based solution will make the database design more user-friendly and facilitate the monthly generation of reports by employees. In addition, the deployment of this web-based method increases the likelihood of obtaining a maximum court booking.

## **2. Related Work**

### **2.1 Web-Based System**

Due to the significance of internal and external idea management (IM) in innovation processes, web-based idea management systems (IMS) are now critical assets for organizations [2]. In this revolution 4.0, everything needs fast access to build a system. Of course, adequate technology is needed to achieve this goal. A web-based management information system is the right solution at this time. The rapid development and advancement in technology require one to follow developments and progress. This development has been widely used by many parties [3].

### **2.2 LAMP Stack**

LAMP is an open-source web development platform consisting of Linux as the operating system, Apache as the web server, MySQL as the database system, and PHP/Perl as the back-end scripting language. LAMP is one of the most effective platforms for the building of web applications since each of its components allows for seamless connection with the others. LAMP is one of the oldest stacks that many enterprises favor. LAMP gives complete server administration and remote access, allowing administrators to execute administrative tasks via a Linux server from anywhere [4].

### **2.3 Study of Existing Related System**

The Pura Kencana Sports Centre Management System is an example of a working online system. The existing system is used as the basis for the analysis of the proposed system. Universiti Teknologi Malaysia (UTM) Sports Complex Booking System, Universiti Malaya UMPOINT Sports Centre, and Lembaga Sukan Sukan Negeri Sabah (LSNS) GoNet e-Booking have been chosen as reference systems.

**Table 1: Comparison between the existing system and the proposed system.**

Feature/Module	UTM Sports Complex Booking System	UMPOINT Sports Centre	LSNS GoNet e-Booking	Proposed System
Registration & Login	Email and password	Email and password	Email and password	Email and password
Calendar Timeslot	No	No	Yes	Yes
Email Verification	No	No	Yes	Yes
Products Promotion	No	No	No	Yes
Multiple User's Status	No	No	No	Yes
Events Booking	Yes	Yes	No	Yes
Application Type	Web-based	Web-based	Mobile application	Web-based

The system that is developed, which is the Pura Kencana Sports Centre Management System, has all of the characteristics listed in Table 1. This system is capable of performing the function with more effectiveness and efficiency.

### 3. Methodology

Methodology is a technique or component used to organize and describe the procedure and flow of system development. The software development life cycle has the greatest impact on software quality (SDLC). The software development industry uses the SDLC to design, produce, and test high-quality software [5].

#### 3.1 Agile Software Development Model

For the development of this suggested system, the Agile Software Development model was adopted. The Agile Software Development model is one of the most well-established software process models now utilized in system development. Agile Software Development model is a blend of iterative and incremental process models that emphasize process flexibility and customer needs by delivering functioning software solutions rapidly. The agile paradigm employs the Software Development Life Cycle idea (SDLC). The planning phase is the first step of the agile approach. The next step is the requirement analysis phase, followed by the design phase, which addresses how to design the system. Afterwards comes the implementation phase, followed by the testing phase. Once the process flow from the planning phase to the testing phase has been completed, it will be regarded as one iteration and will be repeated in the second and third iterations. The process flow between the first and second iteration is known as incremental process [6].

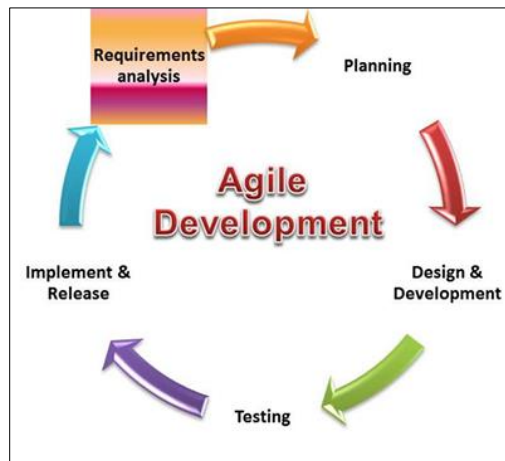


Figure 1: The Agile Development Cycle [7].

### 3.2 Phases of Agile Software Development Model

#### i. Planning Phase

In this phase, planning for the project is discussed and finished. The results of the planning phase have been covered in Chapters 1 and 2. Following the owner of Pura Kencana Sports Centre's request for the proposed system, the title and kind of the system have been debated and specified. Before doing any system development, Chapter 1 outlined the project's aim and scope. The present system and the new system were considered to assure the successful completion of the project. The timeframe for the project was prepared and displayed using Gantt Chart.

#### ii. Requirement Analysis Phase

In order to develop the system, the hardware, software, and user requirements had been collected and compiled. The interview is used to collect data and criteria, such as functional and non-functional requirements, from the stakeholder. The interview question is also intended for the owner. The interview revealed the related manual process problems. The interview is performed between the software developer as the interviewer and the owner of Pura Kencana Sports Centre as the interviewee. The developer was able to suggest a customized solution that will be implemented into the web-based management system as a result of the interview.

#### iii. Design Phase

During this phase, the architecture, flowchart, use case diagram, sequence diagram, and flow chart for the current and proposed system's process will be developed. The database design will include a class diagram and data dictionary. In this phase, the interface is also designed according to the user interface's concepts.

#### iv. Implementation Phase

During this phase, the suggested system will be built using the scripting language and database. In addition to implementing the suggested system, the data will be saved in the database. In this phase, just a portion of the system is developed then in the subsequent phase, the whole system is developed. The system will be developed using Adobe Dreamweaver, Sublime Text, and MySQL as the database for this project.

#### v. Testing Phase

In this phase, the system will be tested before to its development into a functional system. For each iteration, a test plan will be created. In this phase, several forms of testing will be conducted, including

system testing, integration testing, and unit testing. The system will be checked to identify the error and ensure that it meets the standards of Pura Kencana Sports Centre's owner. The result of user testing from several form questions on user satisfaction of the system interface and system functionality are shown in Appendix A.

### 3.3 Hardware and Software Requirements

Hardware and software requirements are determined in developing this system. Table 2 and Table 3 show the hardware and software requirements for developing the proposed system. All of those requirements are needed to make sure the system could develop successfully.

**Table 2: Hardware requirements**

Item	Hardware	Purpose
1.	Acer Nitro 5 AN515-54	Using software to code, design, implement, and test the system. It also used for writing documentation work.
2.	Solid State Drive (SSD)	To backup project
3.	Random Access Memory (RAM)	To perform software applications

**Table Error! No text of specified style in document.: Software requirements**

No.	Software	Description
1.	XAMPP	To store, receive, and send or "serve" files and data to other computers on its network.
2.	Sublime Text	As a platform to develop the system. Design web page with HTML and CSS; develop the function of the system with JavaScript; design database using PHP.
3.	MySQL	To store input database and retrieve output when User wants display record.
4.	Microsoft 365 Apps	To write documentation work, presentations, and diagrams.

#### 4. System Analysis and Design

In this section, the proposed system analysis and design will be discussed.

##### 4.1 Functional Requirement Analysis

Functional requirements are features or functions that the software developer must implement in order to enable the users to accomplish their tasks. Table 4 shows the functional requirements for the proposed system.

**Table Error! No text of specified style in document.: Functional requirements for the proposed system.**

Item	Module	Functionalities
1.	Registration Module	<input type="checkbox"/> The system allows users to register before they can log in. <input type="checkbox"/> The system allows the admin to access the system using a specified email and password. <input type="checkbox"/> The system allows users to view the services and promotions provided.
2.	Booking Module	<input type="checkbox"/> The system restricted to customers. <input type="checkbox"/> The system displays each court's operating hours and daily (anonymous) reservations. <input type="checkbox"/> The system allows users to click individual cells facilitates interaction. <input type="checkbox"/> The system will automatically close past slots and no longer clickable and are noted as <i>past</i> . <input type="checkbox"/> The system's calendar is responsive, meaning it will adapt to the size of the user's screen (on modern web browsers). Thus, when the screen size decreases, fewer days will be shown simultaneously. On extremely tiny displays (such as those seen on mobile devices), just one day will be shown.
3.	Admin Module	<input type="checkbox"/> The system allows the admin to manage courts, bookings, users, update the page content, update contact details, change their password, manage file manager, configuration, and log out.
4.	Notification Module	<input type="checkbox"/> The system sends an activation email to new registered User before they can log in.

### 4.2 Non-Functional Requirements

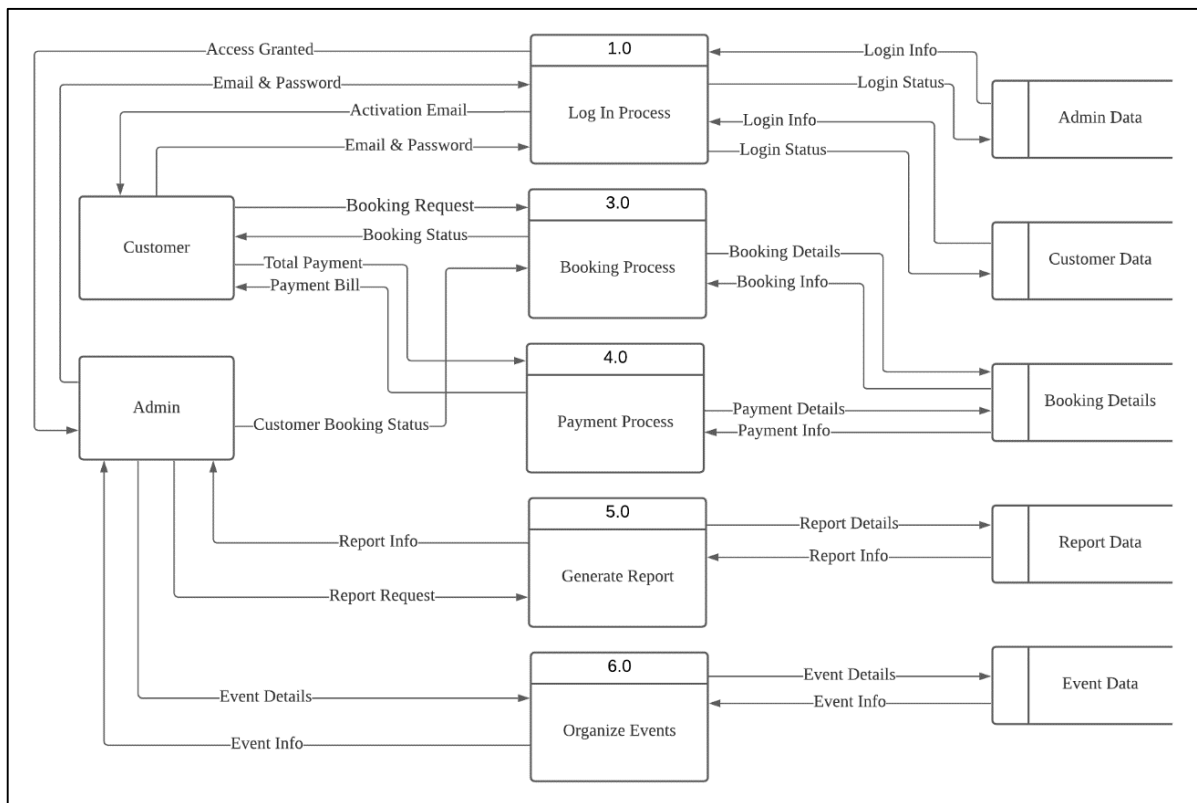
Non-Functional requirements describe how the proposed system must behave and establish constraints of its functionality. Table 5 shows the non-functional requirements for the proposed system.

**Table 5: Non-functional requirements for the proposed system.**

No.	Data	Functionality
1.	Operational Requirement	The system can be accessed using a web browser and is only available when there is an internet connection.
2.	Usability Requirement	The system provides attractive, user-friendly, and easy-to-understand applications and provides a variety of modules for the users.
3.	Security Requirement	Users need to enter their email and password to access the system so that the user information such as a home address, email, and phone number will be protected.
4.	Portability Requirement	The system is portable because it can be used on smartphones and computers.

### 4.3 Data Flow Diagram (DFD)

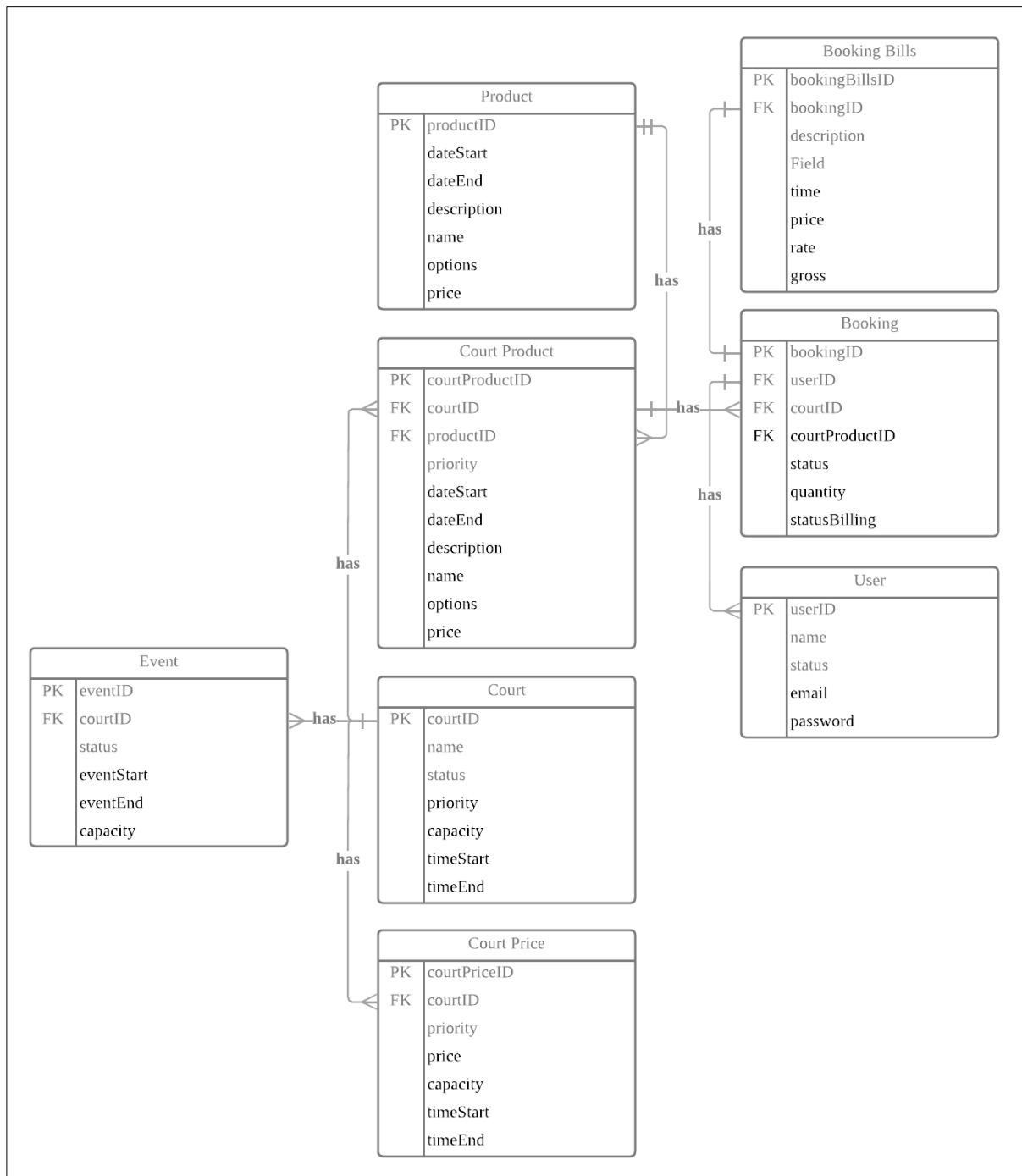
A Data Flow Diagram (DFD) depicts how information flows through the proposed system. It shows data inputs, outputs, storage sites, and paths between each destination using predetermined symbols. Figure 3 demonstrates the DFD of the proposed system.



**Figure 3: Data Flow Diagram (DFD) for the proposed system.**

#### 4.4 Entity Relationship Diagram (ERD)

The system's ERD contains the major entities within the system scope and the relationships among these entities. Figure 4 shows the ERD created for the proposed system.



**Figure 4: Entity Relationship Diagram (ERD) for the proposed system.**

#### 4.5 Interface Design

The interface of the registration page, booking page, and admin main page of the system had been shown in Figure 5, Figure 6, and Figure 7.



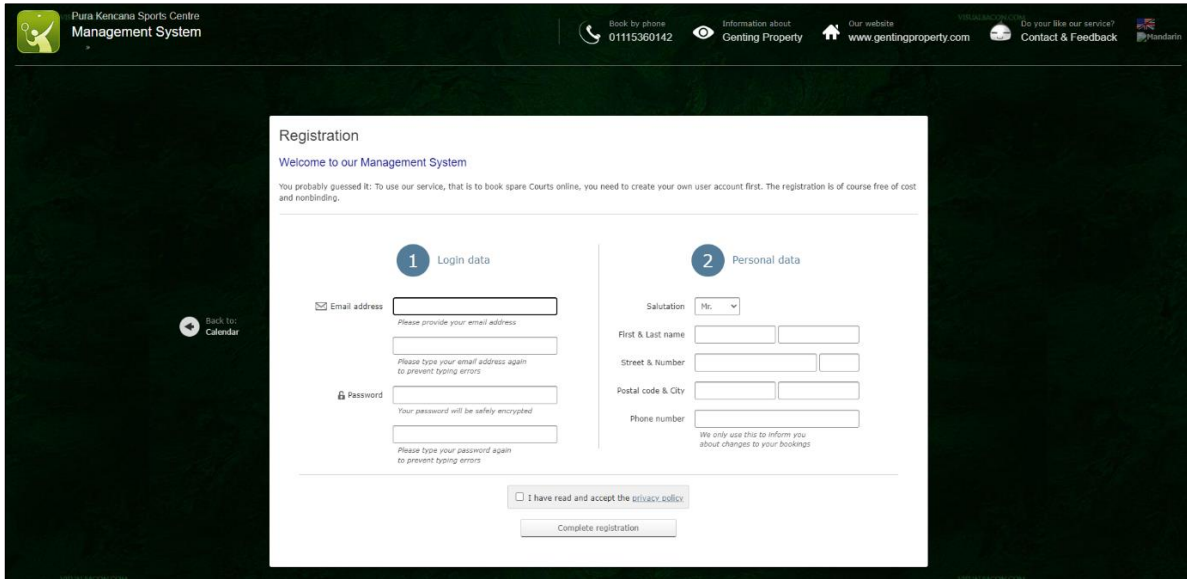


Figure 5: Registration and Login page.

Figure 5 shows the registration page where the customers must fill in their credentials such as email address, password, home address, and phone number.

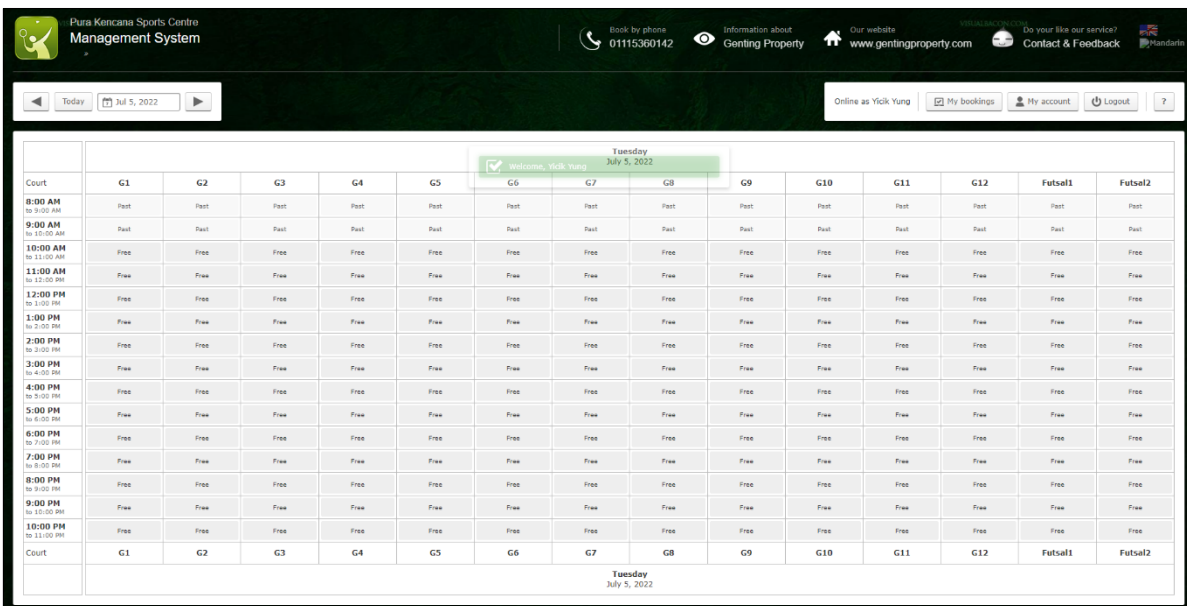


Figure 6: Calendar Booking page for customers.

Figure 6 shows the booking page which is also called “Calendar” where all the users including the admin can book their desired court, date, and time to be reserved.

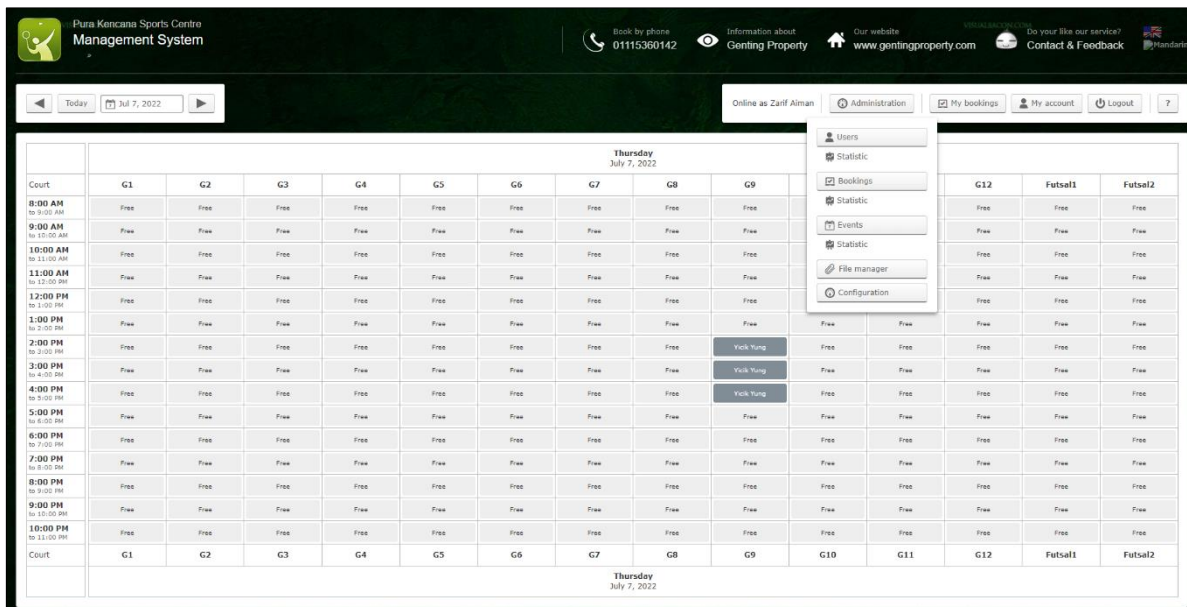


Figure 7: Admin main page.

Figure 7 shows the main page for admin. It is the same design as the customers and other users except for the “Administration” button where the admin can manage users, bookings, events, and configuration of the system.

## 5. Conclusion

On the basis of the achieved results, it is possible to conclude that this project was a success because all of its objectives were met. In the planning phase of the Agile Software Development Model, the development of this project is proceeding as planned and on schedule. The objectives and scope of the Pura Kencana Sports Centre Management System are determined during the planning phase. Every phase of the Agile Software Development Model is completed on schedule.

The Pura Kencana Sports Centre Management System is designed for the advantage of its users, particularly the sports centre. The benefits are that the sports centre can track customer data, manage existing products and users so that there is no duplication in the booking system, manage booking dates in a systematic manner, and track the number of monthly customer bookings. However, this system has a number of limitations. The limitations of this system can serve as a starting point for the future development of the Pura Kencana Sports Centre Management System. First, the system lacks a page that could attract customers to the other exciting services provided by the Pura Kencana Sports Centre. Second, the system is dependent on an internet connection, and network issues will disrupt its operation. Thirdly, the system lacks a secured online payment solution in order for customers to complete their bookings.

Future work can include improvisation, despite the limitations that have been identified. Modifications such as including promotions on the home page to inform the user of current promotions, adding more information about the owner's store on the "About Us" page, and incorporating alternative payment methods such as online banking transfer or Financial Process Exchange (FPX). These enhancements to the system will ultimately render it more appealing, flexible for other devices, and user-friendly.

### Acknowledgement

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### Appendix A

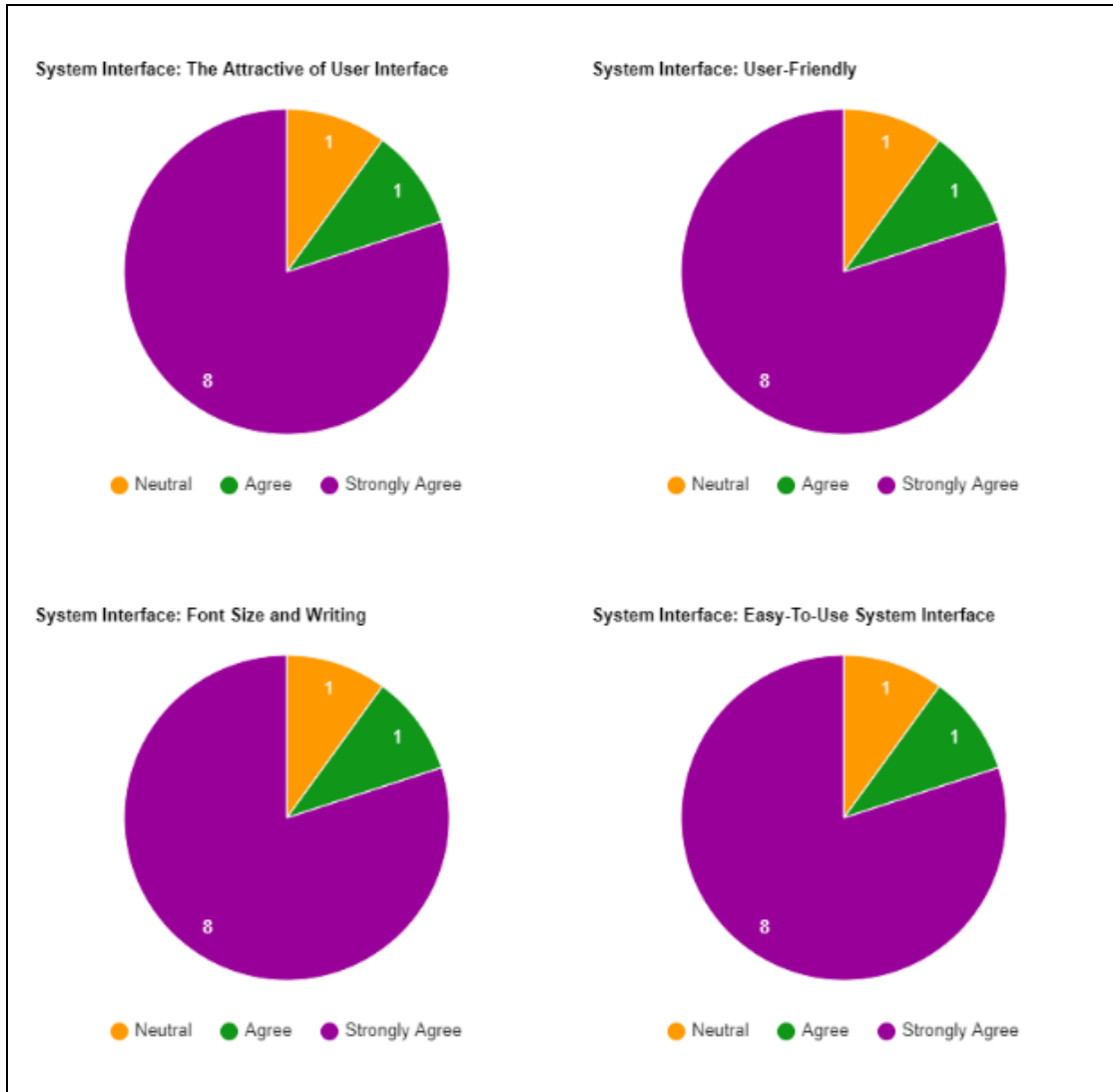


Figure A.1: Result of system testing on System Interface: The Attractive of User Interface

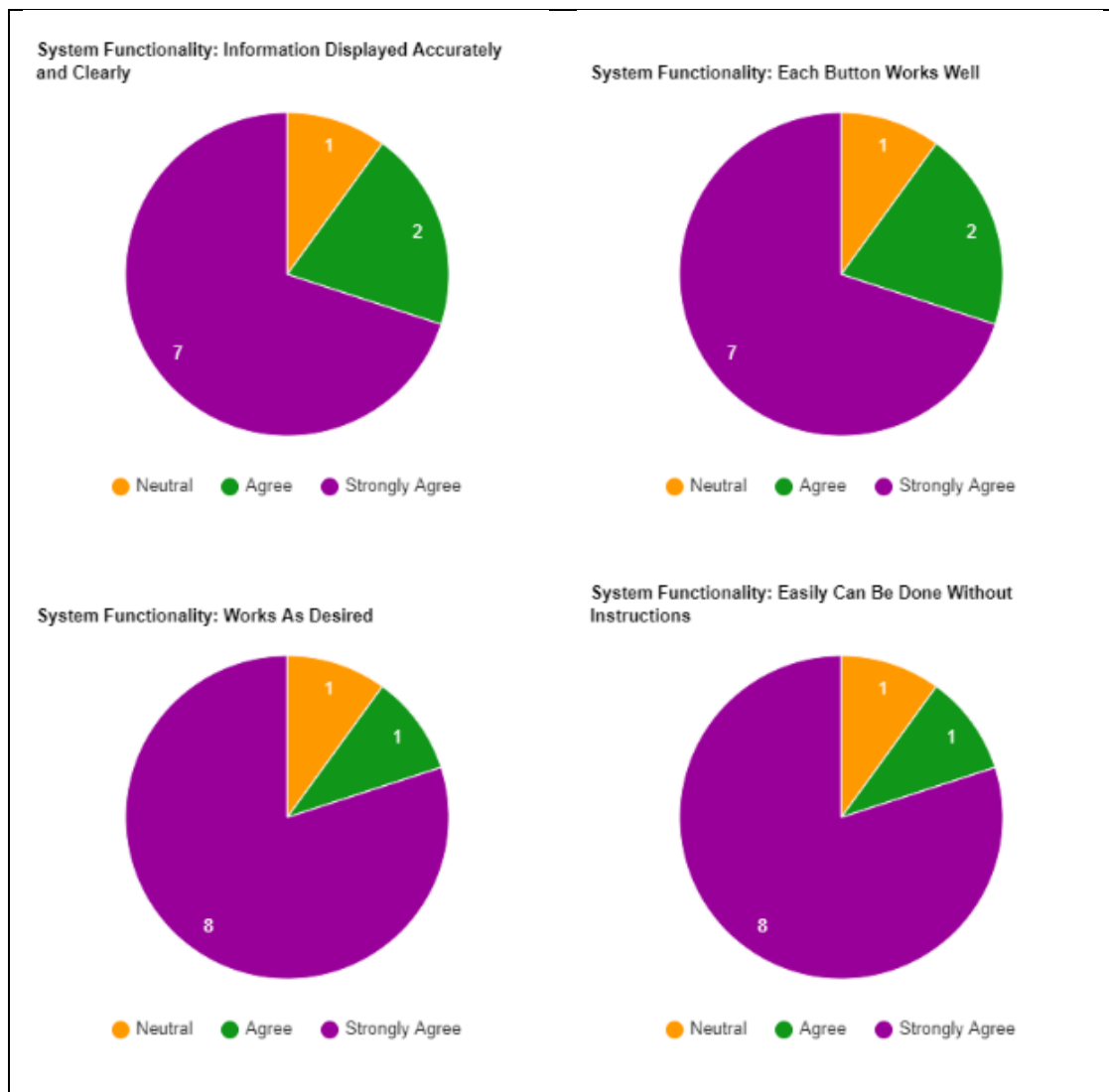


Figure A.2: Result of system testing on System Functionality: Information Displayed Accurately and Clearly

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