Design of a Digital Platform for Managing Mental Health Consultations for Children

Aman Kumar Singh[1] , Sourabh Joshi,[2] Subham Agarwal[3], Sneha Agarwal[4]
Computer Science, Department of Computer Science, VIT Bhopal University , Bhopal Madhya Pradesh, India {amankumar.singh2022 , Sourabhjoshi2022 , subhamagarwal2022 , snehaagarwal}@vitbhopal.ac.in

Abstract - Booking an appointment online has grown in popularity over the past few years. Many different types of businesses use some type of Web-based online appointment management system to help make the appointments setting appointment process more streamlined. An online management system allows students to register and book appointments with their advisers. This paper gives details of the development process of an online appointment Web-based management system to be used within a higher education Institution. We have conducted some experimentation to show the effectiveness of our system.

Keywords: Web 2.0, Web Technology, Appointment management system, Web based application.

Introduction

Web applications have helped in streamlining many of the tasks we perform on a daily basis, and have made our lives easier. These applications are widely used to assist us in overcoming problems with student learning and scheduling appointments. In the past, these appointment processes were done manually and, because of this, there were many an instances of overbooking or forgetting to cancel appointment which could free up the space to schedule another in its place. To eliminate human error due to setting appointments manually, a web application will be developed to make the scheduling process easier. Also, given the busy lives that many of us lead today, an online appointments management system within a university makes perfect sense as it frees up valuable time, not only for students, but also for lecturers and university staff members.

The purpose of this paper is to develop and evaluate an online lecturer appointment system for students' projects, where all processes of appointments are verified. Most aspects of appointment management, such as reservations, confirmations and cancellations, are controlled automatically. Our online appointment management system for students' projects should be able to facilitate the task of booking an appointment with lecturers.

Nations defines web application as any application which can use a web browser as a client. The application can be simple Such as a message panel or a visitor sign-in book on a website, or complex like a word processor or a spreadsheet [5]. In the proposed paper, a new web application called KinderConnect will be developed using the MERN stack (MongoDB, Express.js, React.js, Node.js) [9]. This online psychiatrist appointment management system will allow children (or their guardians) and psychiatrists to interact with each other in real time. The application streamlines the appointment and registration process, ensuring accessibility and efficiency.

The application will be hosted on a multi-platform-compatible environment, allowing users on older systems (like Windows XP or Vista) to access or print reports generated from the system [7]. This ensures compatibility across various user devices, especially in environments where not all systems are up to date [4].

All users—psychiatrists, guardians, and admins—receive real-time updates. Traditional systems often delay reflecting changes, but with KinderConnect, once an appointment is added, canceled, or modified and passes through verification, it's instantly visible. For example, when a psychiatrist updates their availability, guardians can immediately view open slots and book appointments without delay.

To reduce errors caused by manual scheduling, KinderConnect replaces the old system where:

- A guardian would physically visit a clinic to request an appointment.
- A receptionist manually fills a scheduling form.
- That form is handed over to the psychiatrist.

By digitizing this entire workflow, KinderConnect provides a smarter, error-free solution for mental health appointment management.

- The information is then entered into the psychiatrist's calendar whenever the staff gets around to it. This means that even if a guardian books the earliest available slot, it might not be reflected immediately in the system. There's a risk that another staff member or user might assign the same time slot to a different child, leading to double bookings or missed appointments.

- If rescheduling is necessary for the first child, the staff member must contact the guardian, explain the booking conflict, and attempt to reschedule the appointment. This manual back-and-forth consumes valuable time that could otherwise be used to support the child, assist staff, or allow the psychiatrist to focus on consultations —reducing overall productivity.

The paper is organized as follows: section 2 presents the related works, section 3 considers Requirements and Design, section 4 also discusses the implementation and testing, and section 5 presents the system evaluation.

2 Related Works

2.1 Web Application

Lately, there have been many evolving trends in web application development, a field that continues to grow rapidly. Jazayeri stated, "Web applications have a user interface based on the browser that interacts with the user and can manage large amounts of data" [2]. One key reason for their popularity is that new versions can be deployed instantly without requiring manual installation on user devices, unlike desktop applications that demand full installs or patches [2].

The development of online appointment management systems is growing significantly, especially in healthcare, because it provides a more efficient way of handling administrative and scheduling tasks [3]. These systems have been widely adopted in hospitals and mental health centers to manage patient records and appointments.

Although KinderConnect is being developed for a child psychiatrist appointment platform, inspiration is drawn from existing systems used in healthcare. For example, UCLA developed a web-based hospital data management system, which, despite its limitations, has been successfully deployed across numerous institutions [8].

Similarly, Lu and Ab Hamid (2007) developed WBAMS, an appointment management system built using WEBML and .NET four-tier architecture, which they claimed improves efficiency and effectiveness in scheduling. Their system was based on six functional requirements.

In KinderConnect, a similar modular structure is being considered, with components such as:

- User Maintenance Module - Used to manage and the user groups.

maintain

- Admin Dashboard Module – enables admin to manage user roles, monitor appointment flow, and view system analytics.
- Calendar Sync Module – syncs psychiatrist availability with the appointment system in real-time to avoid double bookings.
- Child Profile Management – allows guardians to maintain detailed records including child's medical history, age, and preferences.
- Feedback and Rating System – lets guardians provide post-appointment feedback, helping improve psychiatrist accountability and service quality.
- Consultation Module - Allows the lecturer to manage his/her appointments. The lecturer may schedule and cancel appointments as well as block some students from scheduling.
- Appointment Module - This is where the students schedule their appointments.
- Payment Integration Module - This is used by the administrator.

There are also non-functional requirements that were used:

- Usability - The intuitive interface provided by the system.
- Performance - Deals with the response time of the system.
- Maintainability - The ability to modify a component without affecting other components.

The authors developed different views for the students, lecturers and administrators using the system:

- Student Site View - This consists of an appointment area and a student area.
- Lecturer Site View - Consists of the lecturer and appointment view.
- Administrator Site View - This is the default page users see when they log into the system.

2.2 Web 2.0 Technologies

A website programming language, Web 2.0 was named as a result of a meeting between Tim O'Reilly and Media Live International. O'Reilly said that Web 2.0 had become more interesting than before because it had some new features which increased the functionality of web sites, such as YouTube, Facebook and Bloglines [6].

2.2.1 Web 2.0 Concept

Web 2.0 is a term that refers to a group of new technologies and web applications that led to changes in the behaviour of the global network "Internet". O'Reilly defines Web 2.0 as embracing the business on the Internet as a platform and using its power [6].

Web 2.0 consists of applications based on the World Wide Web which carries a number of features that distinguish it from Web 1.0. For example, it allows users to use applications that rely on the browser. Therefore, these users can obtain their own database on the site, and can also control this database. In addition, Web 2.0 allows users to add values to the applications which are based on the browser [6].

3 Requirements and Design

3.1 Descriptions of Data Requirements

A lot of data requires being stored in a database. This includes the details of each user, and appointments. Data requirements provide a detailed description of the data model which the system must use to accomplish its functional

requirements. In this section, we provide details about the required data, as well as any security issues surrounding access to that data. The system needs to keep details of lecturers, students,
projects and appointments.

 Information about each lecturer and student is recorded at registration. These are Children ID, name, user name, password, email and activation. Every user has activation and blocking fields.

 Each user name is unique.

 Each user has a privilege stored in field roles that manage the security. The availability of the lecturer is stored in lecturer available, while student unavailable stores the student unavailability.

 Each student may register his project with a lecturer. This includes project ID, lecturer ID, student ID, project name and description. Each student chooses only one project. The acceptance of a student by a lecturer is recorded in the field acceptance in the table student project.

 Information recorded for each appointment includes appointment ID, project ID, lecturer ID, student ID, start time, end time, duration and date.

 Each appointment should contain points which include points ID, appointment ID and point's title.

 Each appointment should also contain results which include results ID, appointment ID and results title.

3.2 System Architecture

The OAMS allowed Childrens to schedule their own appointments, cancel and register. The newly developed online appointment registration system also allowed students to avoid the hassles and mistakes that can occur as a result of using paper registration. Since everything is done in real-time, the registration process will be fair and done on a first come, first registered basis. Allowing childrens to book their appointment with lecturers online has several benefits.

 The system will be available twenty-four hours/seven days
a week allowing for scheduling at a time that best suits the childrens.

 Students will be able to view the lecturer's availability for appointments and schedule accordingly.

 Lecturers can add results after finishing the appointment.

 All processes are performed in real-time which cuts down drastically on mistakes and errors.

Figure 1: The users' abilities and privileges, and functionality of the web application.

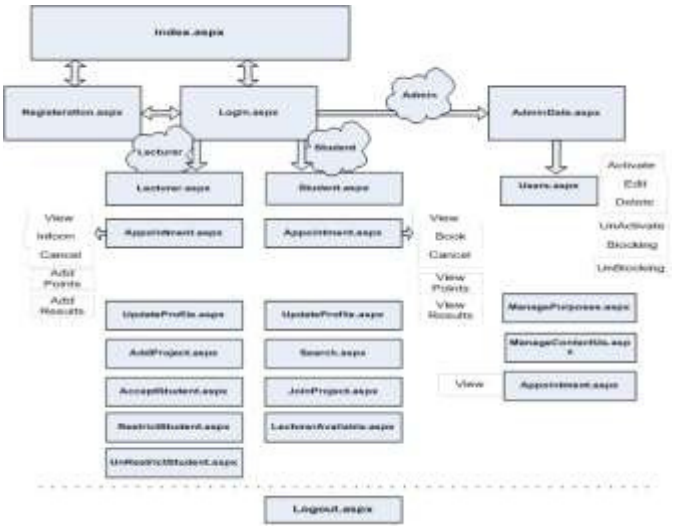

Figure 1: Diagram of the Research

The creation of database tables in KinderConnect is based on the Entity Relationship Diagram (ERD).
Each entity is converted into a relational table, and its attributes become the fields of that table. **Figure 2** illustrates the database relationships for our online psychiatrist appointment management system, clearly showing how different entities like Users, Appointments, Psychiatrists, and Sessions are linked in the database structure.

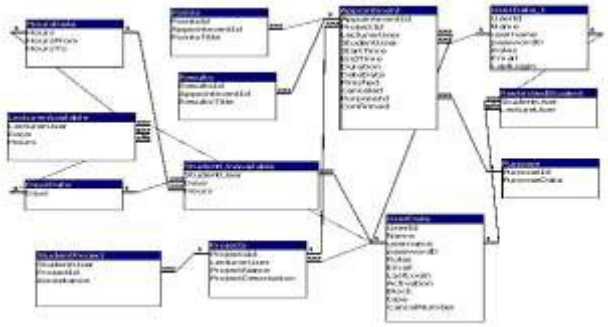

Figure2 Database Relationship Diagram

4. Implementation and Testing

In this section, the implemented pages as can be seen during the browsing on the online appointments management system are displayed

4.1 Implementation in General

The implementation and development of an online system to manage appointments between lecturers and students is the main goal of this research. The content of this system should adapt to the users' requirements. For instance, reservations, confirmations and cancellations have to be implemented in this system.

In this system, students can register in and join a project which has been added by a lecturer. They can also reserve appointments with lecturers. In addition, they can manage

Guardians can cancel or reschedule appointments on behalf of their child.

On the other hand, psychiatrists can register, update their availability, and accept or reject appointment requests. After each session, they can also log session notes or observations.

If a guardian cancels appointments more than five times, the system allows the psychiatrist to restrict further bookings from that account to ensure fairness and time efficiency

4.2 Description of Implemented Pages

In this part, the main pages in the website will be described.

4.2.1 Registration Page

In order to let students book appointments with lecturers, they have to complete the registration forms which include:

- Personal and contact information: Name and Email.
- Login information: User name and Password.
- Available time: Available time for lecturers and lecture schedule for the student.

Lecturers can add projects for students by adding the project name and description. In addition, students can select a lecturer's name, and then choose a project from a list of projects which can be added by the lecturer.

After a student joins a project, the lecturer has to accept that student's decision in order to allow the student to book an appointment with them.

4.2.2 Booking Page

Guardians can book appointments with psychiatrists after viewing their available time slots. They can select the preferred date and time, and also have the option to add the appointment to Google Calendar by logging in with their credentials, as shown in Figure 3. However, psychiatrists can restrict certain guardians from booking appointments if necessary, based on prior cancellations or other valid reasons.

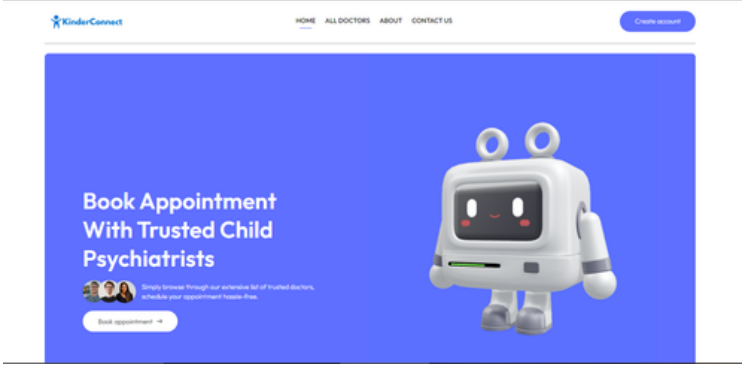

Figure-3 Booking Page

4.3 System Testing

The implemented system has been tested as follows:

- Navigation between pages was tested.
- Registration for lecturer and student was tested.
- All of the users have to be activated by the administrator to allow them to access the online appointment management system.
- Add project by lecturer, join project by student and accept student's project by lecturer were tested.
- Reservation, cancellation and confirmation were checked.
- Appointments enter to Google calendar worked very well.
- Sending an email when the student reserves or cancels an appointment was tested.
- Sending an email when the lecturer confirmed and cancelled an appointment was tested.
- The email reminder worked well.
- The ability of the lecturers to add points for appointments before confirmation and add results after finished worked well.
- Student can view points and results of appointments.
- Restrict/unrestrict student by lecturer was tested.
- User blocking and activation worked well.
- Managing purpose and managing contact us worked well.

5 System Evaluation

Evaluation took place after the system had been used for several weeks. A field study was carried out to observe the system's features and users' usage. Furthermore, the online appointment management system has been compared with another static appointment system.

5.1 System Testing

Some students were asked individually to use the online appointment management system and fill in the questionnaire in order to obtain feedback and to assess the whole system.

Each student was asked to read the following scenario and fill in the questionnaire:

"Assume that you have to reserve an appointment with a lecturer. You are visiting our online appointment management system. Please execute the following tasks:

- Register.
- Login to the website.
- Navigate throughout the website.
- Add your project.
- Reserve an appointment with a lecturer.
- Cancel this appointment.
- Check your email.
- Logout."

5.1.1 Results from Questionnaire

A survey was carried out among 28 students. Most of them were studying for a Master's degree, while 43% were

studying for a Bachelor degree as shown in Figure 4. Table 1 also shows the demographic information about the participants.

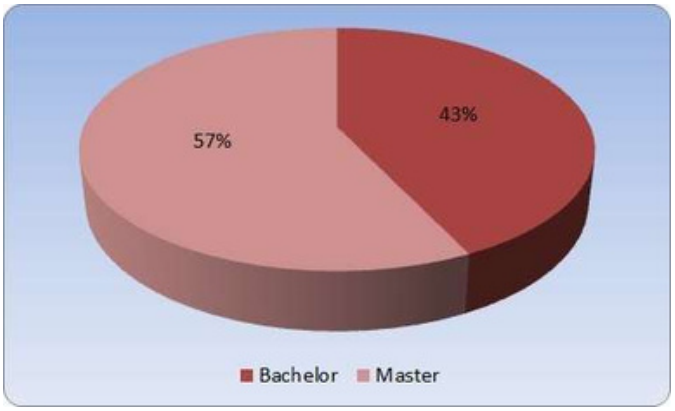

Figure-4 Percentage of Participants' Courses

	19 - 20	21 - 22	23 - 24	25 - 26	27 - 28	Total
Female	1	3	7	3	1	15
Male	5	1	4	1	2	13
Total	6	4	11	4	3	28

Table 1: Participants' Demographic Information

The second and third questions in the questionnaire focused on the features integrated into KinderConnect. All participants confirmed that they were able to successfully book sessions with psychiatrists, as illustrated in Figure 5.

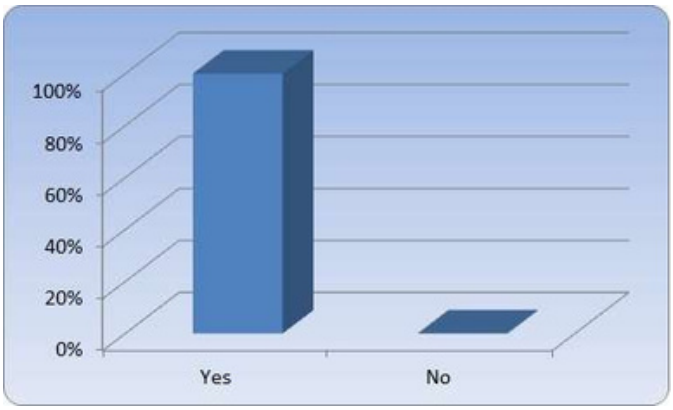

Figure 5: I can successfully book a session with a psychiatrist

In addition, participants were asked whether email reminders for scheduled appointments were among the most important features of the system. 43% strongly agreed, while around 39% agreed, as shown in Figure 6.

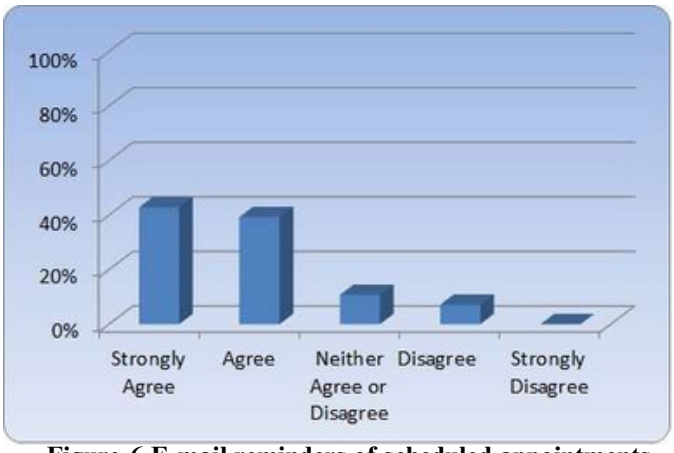

Figure-6 E-mail reminders of scheduled appointments are one of the most important features of this system

6 Conclusion

We felt that the development of an online appointment management system was necessary because of the antiquated way in which many schools register and schedule student appointments. In order to keep up with growing technology, we must seek ways to make certain processes less time consuming, more error free and more user friendly. We have built the system using ASP.NET 2008. A field study has been carried out to observe the features of our system and stakeholders' usage. Furthermore, our online appointment management system has been compared with another static appointments system.

7. References

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