SECD2523 - 03

DATABASE

PROJECT PHASE 1

GROUP NAME : SPICE GIRLS

NO	NAME	MATRIC NUMBER
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3	SERI NUR AYUNI BINTI SALIMI	A22EC0268
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1.0 INTRODUCTION

Nexscholar is a social networking platform for students, academics, researchers and industry players to obtain reliable information and build a strong network of relationships that can benefit each other. It is developed by two excellent lecturers from the Faculty of Computing, Universiti Teknologi Malaysia, Dr Ahmad Najmi and Dr Muhammad Aliff together with Dr Seah Choon Sen from Universiti Tun Razak.

Nexscholar has several modules in its websites to cater to different user needs such as journals, events, scholarships, experts and many more. For example, the journals database module provides a wide range of academic articles written by researchers and experts in specific fields of study. Another module provides a list of collaboration and scholarship opportunities for students and researchers. Next, Nexscholar also has the expert module that lets users find supervisors who specialize in the same study field as them.

Among all modules available in Nexscholar, the event module will be our main focus for this project. In this module, users can find on-going and upcoming events held nationwide and throughout the asia. Users can view details of events such as the date, location and activities. However, this module lacks a crucial feature that needs to be added which is an event booking feature. Currently, users can only view event descriptions but have to manually register through external web pages or in person at the event venue. This process can be troublesome and potentially cause the users to lose interest in joining the event.

Therefore, the key stakeholder of Nexscholar, Dr Ahmad Najmi has proposed a solution to integrate a booking system into the existing event module. The primary goal is to develop an effortless self-booking system that allows users to directly book a slot for their selected event on Nexscholar platform. This feature can offer a smooth event registration and also provide an easy payment process in one place. Moreover, the suggested system will also be equipped with a feedback feature in which users can leave comments or review after attending the events.

2.0 BACKGROUND STUDY

A database is required to develop a complete and practical event booking system in Nexscholar. The primary purpose of the database is to provide a reliable infrastructure to store and manage all relevant data of Nexscholar including booking ticket and attendees information.

The database will store and manage information related to booking tickets such as ticket prices, availability and sales. By utilizing a database, real-time ticket availability can be updated, preventing problems like double booking or overselling. This ensures that both the admin and users can access up-to-date ticket availability information.

Moreover, a database also helps in storing records of the attendees which includes their contact information and credit card details for payment processing. This allows for a smooth registration process and provides a secure method for attendees to make payments. Additionally, the stored attendee information in the database can be used for communication purposes. Nexscholar can easily send automated emails or notifications to attendees regarding booking confirmation or event updates by retrieving the necessary information from the database.

Furthermore, Nexscholar admin can collect feedback from attendees into the database. The admin can then access and analyze the comments or suggestions made by attendees on the events they attended, helping in understanding the requirements and needs of users. From this process, admin can gain valuable insights for future improvements and enhancements of Nexscholar platform.

Another advantage of using a database for this booking system is its ability to manage large volumes of data efficiently. This scalability is important as Nexscholar may grow and needs to accommodate more event bookings and attendees. The database system ensures that the storage infrastructure can handle the increasing data volume while still maintaining the same performance and responsiveness.

3.0 PROBLEM STATEMENT

Prior to this, the existing management system faces deficiencies in crucial aspects, hindering its effectiveness and user experience. The system solely displays events without any mechanism to track or manage attendees and reservations, as well as storing attendees' information details. As there is no specific management such as ticket inventory, current volume of events and many more, the absence of these creates a notable gap in understanding participation in upcoming events, leading to **inefficiency event and attendee data management**.

Moreover, as the number of users would increase over time, this system would be facing **scalability issues**. The constant increase in the number of users poses a substantial challenge to the scalability of the current system. As the user base grows, the system struggles to accommodate the surging volume of events and the increase in the number of attendees. The current infrastructure lacks the scalability required to seamlessly handle the expanding user base and the corresponding surge in event attendance. As a result, the system becomes prone to performance bottlenecks, delays and potential data management issues.

Furthermore, the existing system **lacks a centralized ticketing system**. Prior to this, users can only see upcoming events happening on their calendar, and further ticket reservations and payment need to be done manually. Hence, this leads to difficulties in tracing and tracking attendees' reservations, availability and attendance. Current data pertaining to ticket reservations, attendee details are not stored in a centralized system, leading to **data inefficiencies**.

In another context, the manual nature of payment processing compounds the challenges. The **absence of a dedicated payment processing system** complicates financial transactions related to ticket reservations, leading to error, delay and security concerns. This manual approach not only increases the likelihood of errors but also contributes to delays in processing payments, adversely affecting both organizers and participants.

No feedback management mechanism is present in the existing system. This prevents the collection and analysis of valuable insight from attendees. The absence of a structured feedback system hampers the organizers' ability to understand participant satisfaction, identify areas for improvement and enhance the overall quality of future events.

Communication within the system too is not being highlighted in the existing system. They **lack automated communication** that would create potential delay and errors in conveying important details of ticket information. The absence of a structured system to communicate results in missed opportunities to relay important event details, updates, and announcements directly to participants. This lack of interaction further increases the challenges faced by attendees in seeking information, as there is no streamlined way to communicate with event organizers.

4.0 PROPOSED SOLUTION

The proposed solution aims to address the existing problems or issues in NexScholar comprehensively. In response to the deficiencies in ticket management, a **centralized ticketing system** will be implemented. This system will not only streamline the reservation process but also record the attendees' details upon registration. For the feasibility, the implementation of this requires a technical infrastructure capable of handling large volumes of transactions and data. The scalability and compatibility of the existing system need to be assessed to ensure a seamless integration.

To address the manual payment processing issues, the proposed solution introduces a secure and reliable **payment gateway** within the database system to facilitate seamless financial transactions. Attendees will have the flexibility to make payments by introducing multiple payment options, such as credit, debit cards or e-wallets. Additionally, a refund management system will be implemented to facilitate efficient and transparent handling of refund requests, enhancing the financial transaction processed and reducing the likelihood of errors. Integrating multiple payment options and a refund management system needs evaluation of technical capabilities for secure payment gateways and efficient transaction processing. For the feasibility, compatibility with various payment methods and technologies should be considered.

In response to the lack of feedback management, the proposed solution involves the implementation of a user-friendly **feedback collection system** within NexScholar platform. This feature will allow attendees to easily provide feedback after each event, hence fostering a structured approach to gathering valuable insights. The feedback collected will serve as a refinement for future events to meet participant expectations and to identify areas for improvement. The success of the feedback management system hinges on its acceptance by the users. The feasibility study should address the simplicity and intuitiveness of the feedback system. An easy-to-use interface encourages active participation, ensuring that users feel comfortable providing feedback after each event.

In this proposed solution, enhancement will be made in response to the attendee management by implementing a system that can track and manage attendees and reservations in order to have an efficient event and attendee data management where data is well organized for easier access by NexScholar admin. The system should define ticket types, quota and the prices for an easier booking process by the Nexscholar user on top of enabling attendees to **provide necessary details** during the process of booking of ticket such as email for data storing and notifications purposes. The operational feasibility study should enable the system to be implemented effectively within the existing infrastructure of NexScholar.

To address the absence of automated communication in the system, an **automated email notification system** will be implemented in the proposed solution. Automated email notification system enables the admin to make announcements and updates related to the events and future events directly to the attendees. This system is also implemented for attendee's confirmation on event-booking and reminders about the event. In an effort to enhance user experience and communication channels, the feasibility study evaluates the viability and practicality of putting the suggested automated email notification system into practice.

5.0 OBJECTIVES

This project will outline a few objectives that are going to be implemented in order to provide useful guidance for a successful and effective project execution. The namely objectives are as follows:

- To develop an event booking system for Nexscholar to extend its services and functionality.
- To redesign a system and its database so they are well optimized and flexible to ensure effective data retrieval, storage, management, and analysis.
- To create a database structure that is capable of accommodating the growth of Nexscholar website's platform as well as compromising its scalability.
- To ensure the database performance, effectiveness, and reliability of the database system created for the Nexscholar website

6.0 PROJECT SCOPE

6.1 SCOPES

To visualize a better understanding about the project, we highlight its scopes and define its system boundary as below.

6.1.1 System

Nexscholar website

- Allow data retrieval of event attendees as well as efficient data storage in a database system.
- Provide a payment gateway for the ticket(s).
- Provide a feedback system about users' experience regarding the ticket purchasing system.
- Provide communication between the event managers or Person in Charge (PIC) and users for any direct inquiries.
- Allow a comprehensive and meaningful analysis of data collected regarding the events promoted via the website.
- Allow analysis in terms of ticket availability for the events promoted

6.1.2 User

Event attendees

- Allow event attendees to view the details of events organized and promoted on the website.
- Allow event attendees to book or purchase tickets via its event management system.
- Allow event attendees to make payments for ticket(s) of events they wish to participate in.
- Allow event attendees to contact or communicate with event organizers in cases of inquiries.

- Allow event attendees to give feedback to express their satisfaction with the system.

Website administrator

- Allow the website administrator to collect and store data of event attendees.
- Allow the website administrator to manage and organize the events to be promoted on the website.
- Allow the website administrator to collect and assess the feedback from the website users/event attendees
- Allow the website administrator to analyze the data gathered from the system

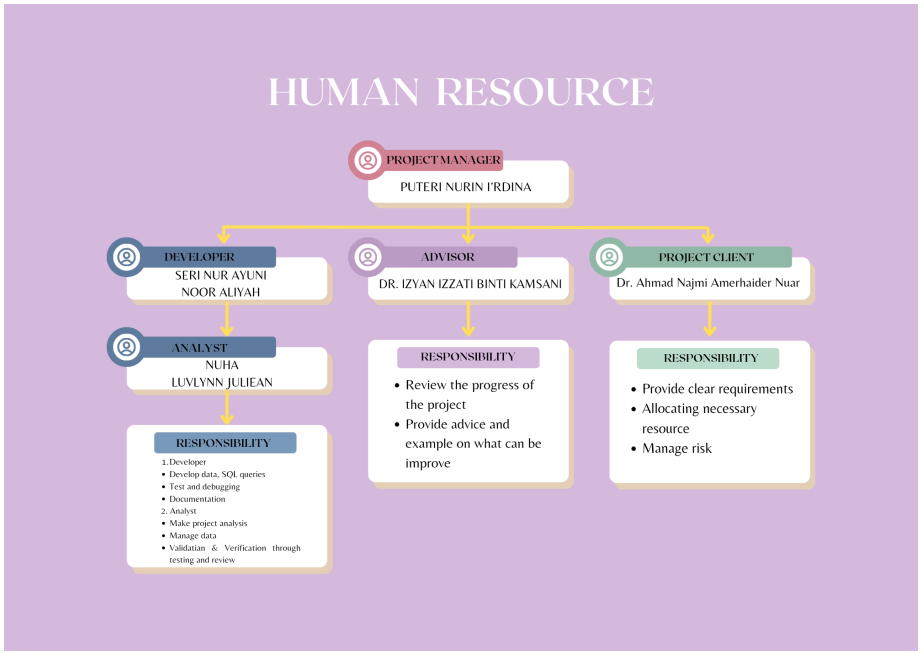
6.2 SYSTEM BOUNDARY

Nexscholar is a website for scholars, be it undergraduate students, postgraduate students, doctorate students, or even lecturers to gather on one platform to gain educational information, namely, scholarships, newsfeed, journal database, and myriad other features. However, the feature that we will highlight as well as enhance in this project is the event management sys tem. In this case, the website will allow users not only to view and learn about events promoted on this platform, but also to book and make online payment for the tickets in order to participate. It will also retrieve and store the data of the event attendees to make further analysis, as well as collecting feedback from the users of the website after they have used the system. Additionally, users or event attendees are allowed to communicate with event organizers especially if they have any inquiries to be made.

7.0 PROJECT PLANNING

To ensure the project is executed with good time management, as well as efficiency, we designed a project planning. In order to do so, we used charts such as Work Breakdown Structure (WBS) and Gantt Chart to better organize and visualize the flow of the project. We will also establish the team structure in Human Resource. The diagrams are as follows:

7.1 HUMAN RESOURCE



7.2 WORK BREAKDOWN STRUCTURE (WBS)

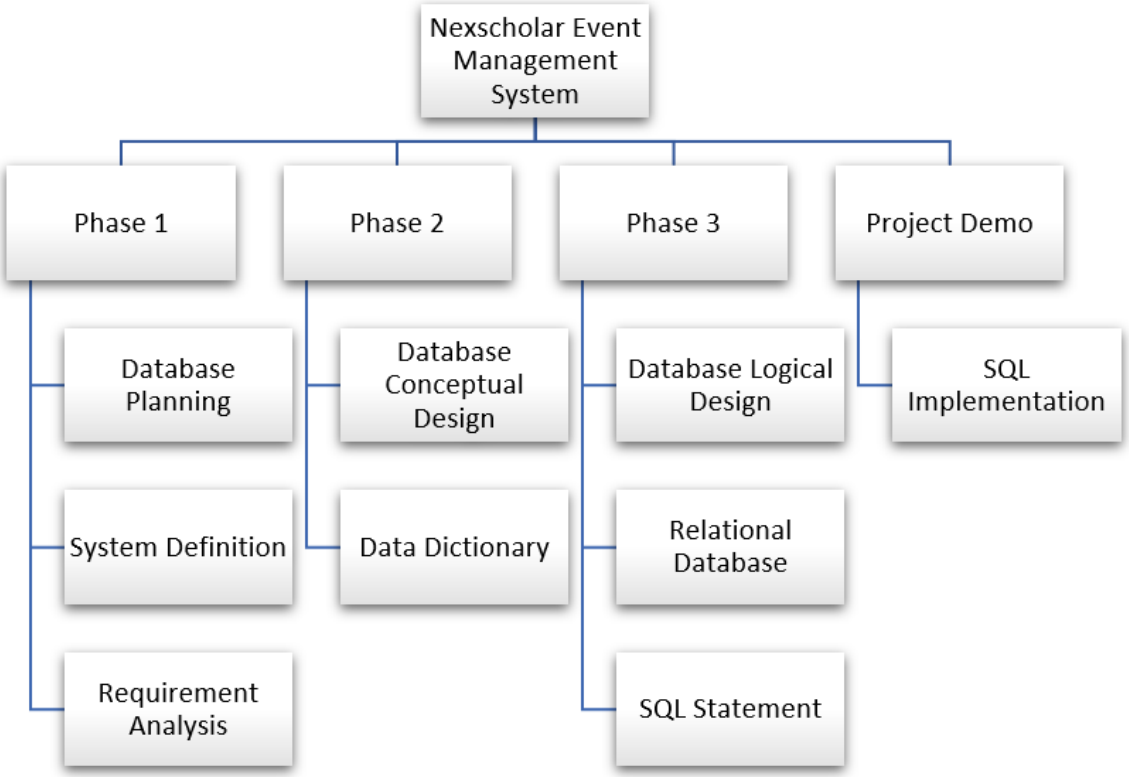


Figure 2: Work Breakdown Structure (WBS) of Nexscholar Event Management System

7.3 GANTT CHART

TASK	DURATION	START DATE	END DATE	Oct 2023				Nov 2023				Dec 2023				Jan 2024			
				W1	W2	W3	W4	W1	W2	W3	W4	W1	W2	W3	W4	W1	W2	W3	W4
PHASE 1	4 WEEK	22/10/2023	18/11/2023																
Database Planning	1 WEEK	22/10/2023	28/10/2023																
System Definition	2 WEEK	29/10/2023	11/11/2023																
Requirement Analysis	2 WEEK	5/11/2023	18/11/2023																
PHASE 2	4 WEEK	19/11/2023	16/12/2023																
Database Conceptual Design	2 WEEK	19/11/2023	02/12/2023																
Data Dictionary	2 WEEK	03/12/2023	16/12/2023																
PHASE 3	4 WEEK	17/12/2023	13/01/2024																
Database Logical Design	2 WEEK	17/12/2023	30/12/2023																
Relational Database	1 WEEK	31/12/2023	06/01/2024																
SQL Statement	1 WEEK	07/01/2024	13/01/2024																
PROJECT DEMO	1 WEEK	14/01/2024	20/01/2024																
SQL Implementation	1 WEEK	14/01/2024	20/01/2024																

Indicator
W1 = Week 1

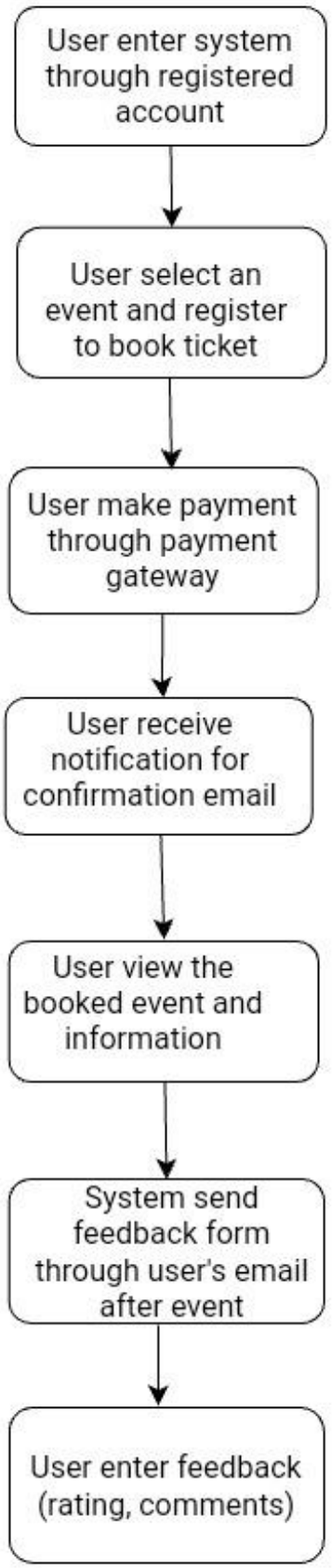
Figure 3: Gantt Chart of Nexscholar Event Management System

8.0 REQUIREMENT ANALYSIS

Category	Functional Requirements	Non - Functional Requirement
1. Ticket Booking and Management	- Store ticket details (prices, availability, sales)	- Performance: Efficient handling of concurrent users
	- Real-time updates for availability	- Reliability: Data consistency during transactions
	- Admin and user access to up-to-date info	- Scalability: Handling increasing ticket sales without performance loss
2. Attendee Information Management	- Store attendee contact and payment details securely	- Security: Sensitive data storage compliance
	- Smooth registration process	- Compliance: Data protection regulations
	- Enable automated communication with attendees	- Efficient retrieval of attendee information
3. Feedback Collection and Analysis	- Store feedback/comments from attendees	- Analytics: Tools for analyzing feedback data
	- Admin access for feedback review and analysis	- Data storage: Efficient management of growing feedback data
4. Automated Email Notification System	- Implementation of automated email notification system	- Viability assessment for enhanced user experience and communication
	- Automated communication for event-related updates and confirmations	- Improve communication channels for better user engagement
5. Compliance and Security	- Compliance with data protection laws	- Data encryption for sensitive information

	- Robust security measures for attendee data protection	- Access control based on user roles

8.1 Current Business Process



9.0 TRANSACTION REQUIREMENT

9.1 Module <Ticket management>

9.1.1 Module Description

The ticket management module only involves the interaction with the admin that organizes the event posting on Nexscholar. This module is for the admin to easily manage, update and delete information regarding event posting and ticket information on the platform.

1. Event posting will be handled by the admin whereby the administrator enters information regarding the event that will be available for Nexscholar users to see and interact with.
2. Once an event is posted, users can make booking and payment for the desired event.
3. The administrator has the ability to edit the event posting and monitor when the quota has been reached.

9.1.2 Data Entry

Admin post about event details provided by event organizers to be posted on the Nexscholar website. The details that need to be entered are:

1. Enter event name
2. Enter contact information of the event organizer: phone number, email
3. Set the duration for which reservations can be made: first day, last day
4. Enter the quota of number of attendees
5. Enter event details

9.1.3 Data Update/Delete

1. Update event information
2. Update the availability of tickets by referring to the quota
3. Delete event information

9.1.4 Data Queries

1. List of event name, contact information, booking duration, quota and event details
2. View attendee quota

9.2 Module <Attendee Management>

9.2.1 Module Description

This module will interact with the website admin, and the users/event attendees. It is designed to manage the event attendees on the website, such as registration management, attendee dashboard, view registration analysis, and delete registration.

1. Users of Nexscholar website who are interested to participate in the events that are promoted on this platform can register and book ticket(s) via this module. In order to register, users need to enter needed information, which is their credentials such as name, phone number, email address, and number of tickets to be purchased.
2. Users are able to refund or delete their registration if they change their minds after already registering for the event.
3. Admin can view and manage the analytics of the event attendees who registered to participate in the event such as the number of attendees registered, and information of the participants.
4. This module allows the website admin to also analyze the registration for the events promoted on the website.

9.2.2 Data Entry

1. Enter attendee's name, IC number, home address, phone number, email address.
2. Enter the number of tickets the attendee wishes to purchase.
3. Enter payment information/method.

9.2.3 Data Update/Delete

1. Update/Delete attendee's registration.
2. Update/delete attendee's information.
3. Update/delete payment information.

9.2.4 Data Queries

1. List of attendees's name, IC number, home address, phone number, email address, number of ticket(s) to book/purchase, and payment information/method.

9.3 Module <Payment Processing>

9.3.1 Module Description

This module will be interacting with registered users, specifically attendees and administrators. This module introduces a secure and reliable payment gateway to facilitate financial transactions related to ticket reservations. This module will also incorporate a refund management system.

1. This module will present various payment options such as credit/debit card or e-wallets to continue the transaction after a confirmed reservation.
2. The user can choose their preferred payment method from the provided options.
3. The payment gateway will verify the entered information and seek authorization from the payment financial institution.
4. Secure protocols such as encryption will ensure data protection during the verification process.
5. Users will receive a confirmation page for reviewing the transaction details.
6. If applicable, users may have the option to initiate refunds.
7. Admins can access a dashboard to track and manage payment transactions, and to monitor payment status.

9.3.2 Data Entry

1. Enter payment method.
2. Enter card details, card number, expiry date, CVV, cardholder name.
3. Enter e-wallet provider, username, password.
4. Enter text field specifying the reason for the refund request, if applicable.

9.3.3 Data Update/Delete

1. Update transaction status; pending, completed, refunded.
2. Update/Delete payment options if necessary.
3. Update/Delete reason for refund request.
4. Update/Delete transaction history.

9.3.4 Data Queries

1. List of detailed transaction information, date/time, transaction amount, name, event, payment method used.
2. List of payment verification, attendee's name, contact information, transaction status, payment details.
3. List of refund tracking, refund request id, date, amount, status.
4. List of financial reports, total revenue generated, refund amount, successful and declined transaction count.
5. List of admin's data, refund requests, pending transaction, user transaction reports.

9.4 Module <Communication>

9.4.1 Module Description

This module will interact with the Nexscholar system, admin and event attendees to assist communication between them. Its aim is to ensure event attendees can receive instant confirmation of their ticket reservation and be notified with event updates or any necessary changes regarding the event.

1. The Nexscholar system will automatically send confirmation emails to attendees upon ticket purchases.
2. The Nexscholar admin will send notifications to attendees regarding changes in event details.
3. The admin also can send reminders to attendees about upcoming events or important guidelines that attendees must follow before attending the event.
4. The event attendees can view confirmation emails and notifications.

9.4.2 Data Entry

1. Enter event and attendee information for the system to generate a personalized automated email.
2. Enter email addresses, unique code, subject line and body.
3. Enter new event information such as agenda, rescheduled date or requirements to notify attendees.
4. Enter a new reminder a few days before the event including necessary instructions.

9.4.3 Data Update/Delete

1. Update fields of emails including code, recipient's information and the contents.
2. Update event notification with new information about the events.
3. Update notification settings or format such as visibility.
4. Delete attendees' email addresses and confirmation email code.
5. Delete event notification and reminder.

9.4.4 Data Queries

1. List of specific event attendees for notification purposes.
2. View email and notification settings or formats.
3. View booked event and attendee information in the confirmation email.
4. View details of event notification and reminders.

9.5 Module < Feedback>

9.5.1 Module Description

This module will be interacting between the registered user which is the event attendees, event organizer and the Nexscholar system to provide a platform for systematically collecting, storing, analyzing and utilizing attendee feedback to enhance the quality of events and improve overall user experience. With this module, it is able to make a decision for future event planning and refinement strategies.

1. The Nexscholar system will send a feedback form to the user's registered email.
2. The user can provide feedback or any improvement to be make on the event or the overall user experience
3. The Nexscholar system will receive the user's feedback and send it to the event organizers' email.

9.5.2 Data Entry

1. System sent feedback form to attendee's email
2. Attendees will enter information including attendee ID, rating(numeric or scale), comments or suggestions.
3. Enter validation to ensure completeness of required fields.

9.5.3 Data Update/Delete

1. Update status as complete/missing for required fields
2. Delete irrelevant or duplicate feedback entries
3. Update additional information or correct errors.

9.5.4 Data Queries

1. Feedback related to a specific event based on its unique ID
2. Output includes ratings, comments and attendee details
3. Summary of feedback report for each event such as average rating, most common suggestion.
4. Search and filter feedback based on various criteria(event type, date, rating, keywords in comments)

10.0 BENEFIT AND SUMMARY

10.1 BENEFIT OF PROPOSED SYSTEM

- **More efficient attendee management**

  Obtaining attendee's information during the booking process to manage and store attendee information efficiently.
- **Streamlined event booking**

  Centralized ticketing system which makes the reservation process more efficient for attendees and more efficient data storing process for organizers.
- **More efficient payment process**

  Secured and reliable payment gateway with multiple payment options and a refund management system.
- **Have a feedback collection system - to further improve website**

  Store feedback left by attendees for event planners to identify areas of improvement for future event purposes.
- **Automated event updates and information**

  By integrating an automated email notification system, organizers can ensure timely and efficient communication with attendees, sending out reminders, confirmations, and other relevant information automatically to all those who have booked a place in an event in the system.
- **More scalable**

  Able to accommodate the increase in the number of attendees by handling the expanding user base and the corresponding surge in event attendance. As a result, less delays and data management issues.

10.2 SUMMARY OF PROPOSED SYSTEM

In summary, the proposed system aims to address existing issues and the absence of certain systems in NexScholar by implementing a centralized ticketing system, a secure payment gateway, and a user-friendly feedback collection system, an efficient event and data management, and an automated communication system. The centralized ticketing system will streamline the reservation process and record attendee's details upon registration. The system must have technical infrastructure capable of handling large volumes of transactions and data. Next, A secure payment gateway will be introduced within the database system to facilitate seamless financial transactions. Multiple payment options will be available for attendees as well as a refund management system to handle refund requests. Alongside a secure payment gateway, a feedback management system will be implemented, allowing attendees to provide feedback after each event, providing valuable insights for future events. Subsequently, the proposed solution enhances attendee management by implementing a system for efficient event and attendee data management. It defines ticket types, quotas, and prices, and allows attendees to provide details like email for data storage and notification purposes. Lastly, The proposed solution will introduce an automated email notification system for event announcements, updates, and confirmations. This system will enhance user experience and communication channels.

11.0 SUMMARY

Nexscholar is a social networking platform for students, academics and researchers to obtain reliable information and build strong relationships. The event module is the main focus of this project, as it lacks event booking features such as a payment gateway for payment processing, and absence of feedback management mechanism. Dr. Ahmad Najmi proposes integrating a booking system into the existing event module to create an effortless self-booking system that allows users to directly book a slot for their selected event on the Nexscholar platform.

This project aims to develop an event booking system for Nexscholar, enhancing its services and functionality. The system and database will be optimized for efficient data retrieval, storage, management, and analysis. The database structure will accommodate the growth of the Nexscholar website while maintaining scalability. The project scope includes the Nexscholar website, which allows data retrieval, efficient storage, payment gateways, feedback systems, and communication between event managers and users. Users will be able to view event details, book tickets, and communicate with organizers. The website administrator will collect and store data, manage events, and analyze data. The event management system will be a key feature, allowing users to view and learn about events, book tickets, and provide feedback. Users will also be able to communicate with organizers for inquiries.

The database in the event booking system is designed to store and manage all relevant data, including booking tickets and attendees. It allows updates on ticket availability, preventing double booking or overselling. Attendee records, including contact information are stored for a more efficient data storage for easy modification and access. The database also allows Nexscholar to send automated emails to attendees regarding booking confirmation or event updates. The admin can collect feedback from attendees, analyze their comments, and gain insights for future improvements. The database's scalability is crucial as Nexscholar may grow and need to accommodate more event bookings and attendees. It ensures the storage infrastructure can handle increasing data volume while maintaining performance and responsiveness.

The existing management system is inefficient and lacks a few features, hindering its effectiveness and user experience. It only displays events without a mechanism to track attendees and reservations, and does not store attendees' information details. This lack of specific management leads to inefficiency in event and attendee data management. Furthermore, the system lacks a centralized ticketing system, causing difficulties in tracking attendees' reservations, availability, and attendance. The manual nature of payment processing leads to security concerns. The absence of a feedback management mechanism prevents valuable insight from attendees, hindering organizers' ability to understand participant satisfaction and identify areas for improvement. Communication within the system is also lacking, with no automated communication system, resulting in missed opportunities to relay important event details, updates, and announcements directly to participants. The proposed solution aims to address the mentioned issues comprehensively by implementing a centralized ticketing system, a more efficient attendee data and event management system, a secure payment gateway within the database system, a feedback collection system and lastly, an automated communication system.

There are 5 modules in the enhanced Nexscholar system. The first module is ticket management module which allows administrators to manage, update, and delete information related to event posting and ticket information on the platform. It includes event details such as event name, organizer contact information, booking duration, quota, and details. Secondly, attendee management module interacts with the website admin and event attendees, managing registration, attendance dashboard, and registration analysis. Subsequently, the payment processing module introduces a secure and reliable payment gateway for ticket reservations and includes a refund management system. Following that, the communication module assists in ensuring instant confirmation of ticket reservations and notifications about event changes. Lastly, feedback module interacts with registered users, event organizers, and the Nexscholar system to collect, store, analyze, and utilize attendee feedback to enhance the quality of events and improve user experience. This module is for status can filter feedback based on criteria such as event type, date, rating, and keywords in comments.