Department of Computer Science
Faculty of Computing

GROUP PROJECT

Phase 2

Database Conceptual Design

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Introduction

In the dynamic realm of information technology, crafting an effective and streamlined database is essential, especially when dealing with intricate systems like the Event Management System on the Nexscholar website. As we embark on Phase 2 of our project, we focus on the conceptual design, setting the stage for a robust and efficient ticket booking system.

Within the Nexscholar Event Management System, Phase 2 unfolds the creation of an Entity-Relationship Diagram (ERD), a visual representation that encapsulates the intricacies of our system's data model. This pivotal stage requires us to identify entities meticulously, define their attributes, explore potential relationships, and determine the multiplicities that govern the connections.

Based on the requirements established in Phase 1 previously, our mission is to translate the unique needs of our event management system into a structured and cohesive database design. Each entity identified plays a crucial role in housing specific information, and the relationships between them weave the fabric of our ticket booking system.

We don't merely settle for the conventional in our pursuit of excellence.
Instead, we delve into enhanced ERD features, adding layers of detail and sophistication to our model. These enhancements meet current requirements and ensure scalability, accommodating future needs seamlessly.

The conceptual ERD we craft is more than a diagram; it's a blueprint for the Nexscholar website's Event Management System. The lines and shapes represent entities and relationships and the flow and connectivity of data within our platform.

To complement this visual representation, we will construct a comprehensive data dictionary. This guide will offer detailed insights into each element of our conceptual design—entities, attributes, relationships, and more—creating a roadmap for our ticket booking system.

Join us in this exciting phase as we transform abstract concepts into a tangible blueprint for the Nexscholar Event Management System. From requirements to conceptual design, this
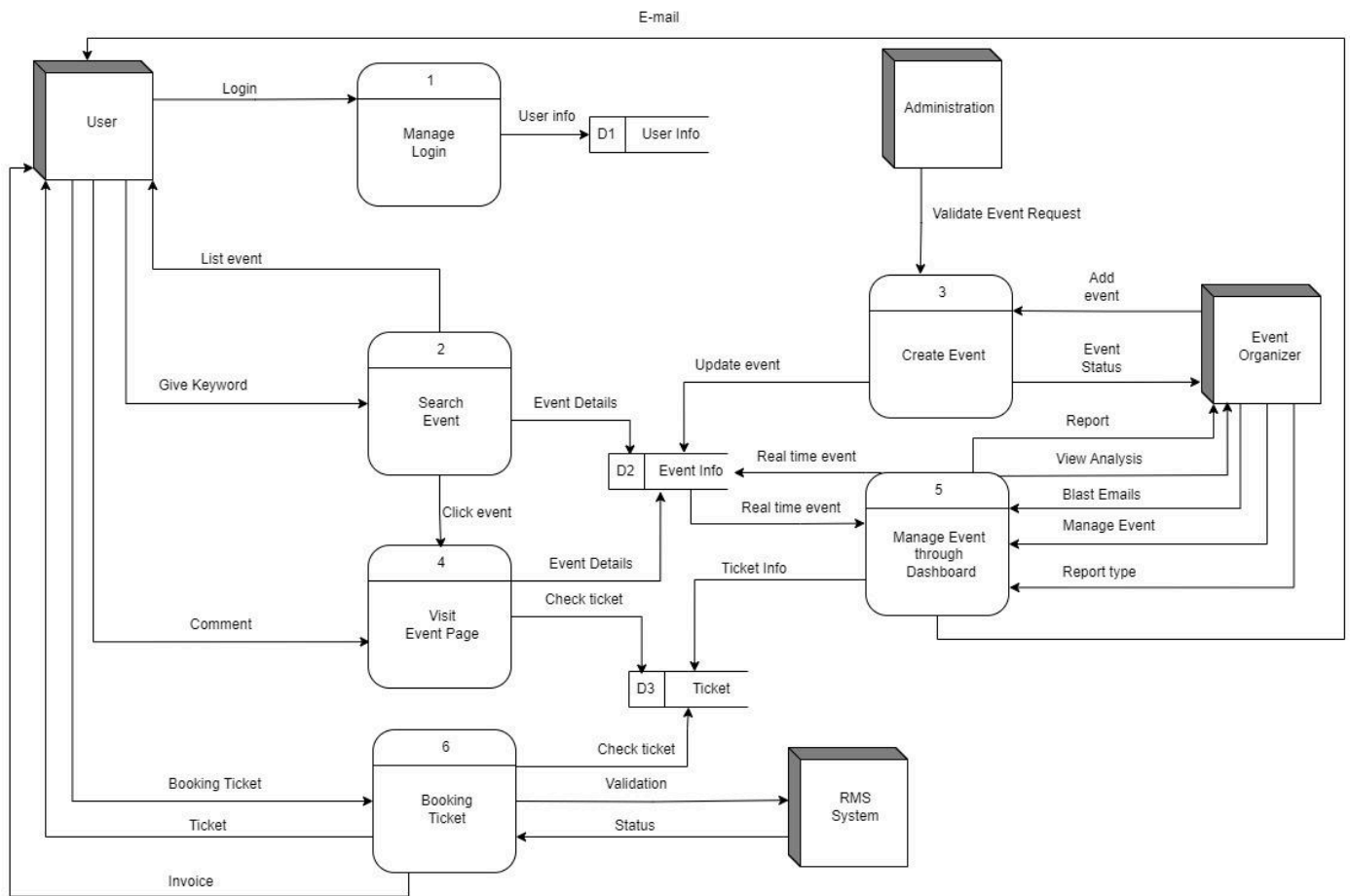
journey is crucial in realising a powerful and efficient ticket booking system that aligns seamlessly with the unique dynamics of our platform. Together, let's shape the future of event management at Nexscholar.

2.0 DFD (to-be)

2.1 Context Diagram
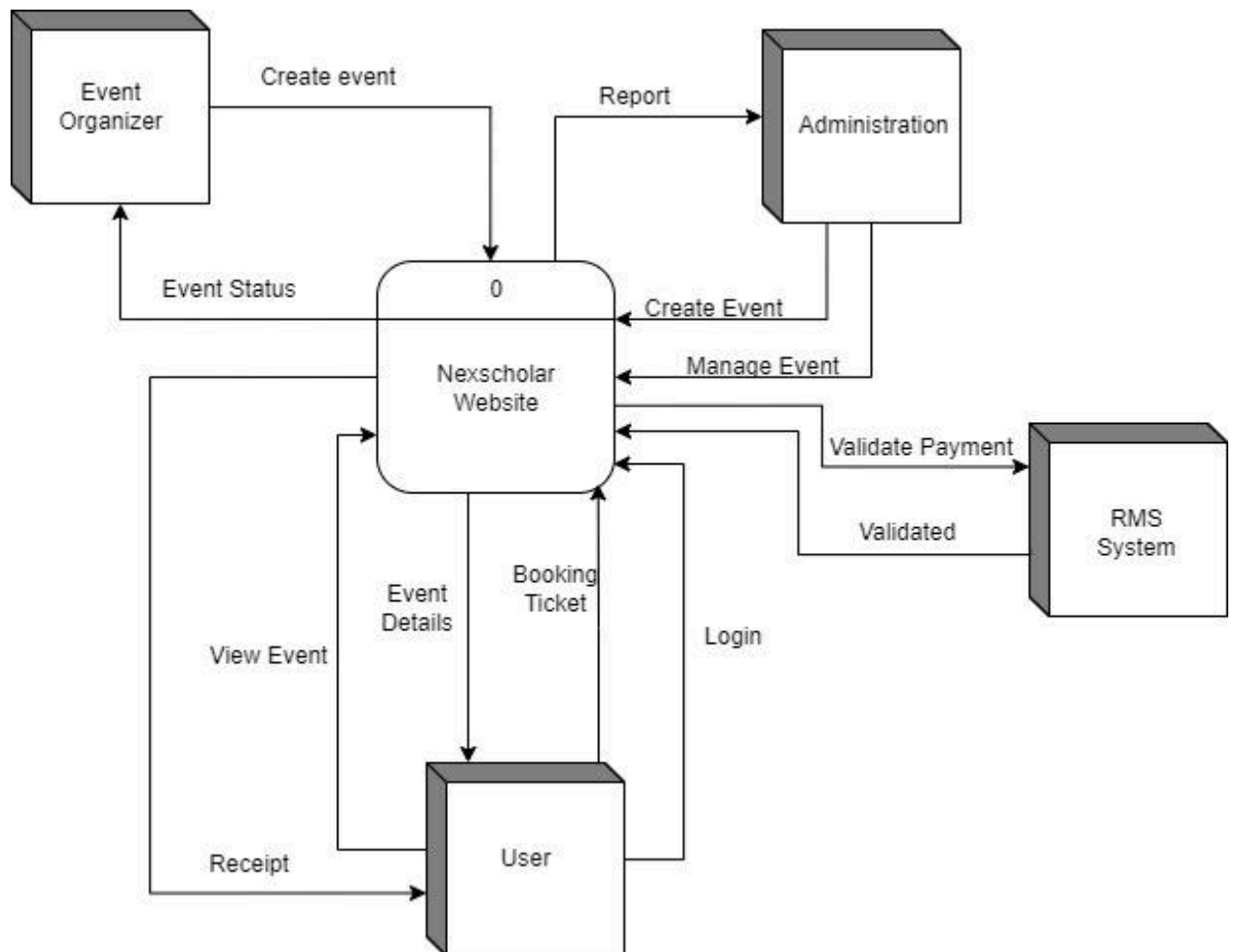
2.1 Diagram 0

3.0 Data & Transaction requirement

3.1 Proposed business rule

1. Broad Features for Event Management:
   - Customisation: Event templates and details should be highly customisable by users, giving them complete control over:
     - Kind of event (webinar, workshop, symposium, etc.)
     - Type of audience: students, staff, teachers, etc.
     - Format of the event (in-person, virtual, hybrid)
     - Structure of sessions (one-time, multi-day, or recurrent)
     - Options for registration (free, premium, and tier-based pricing)
     - Management of speakers and trainers
     - Uploading and managing content (recordings, handouts, and presentations)
   - Capabilities for scheduling:
     - Adaptable event and session scheduling
     - Time zone coordination
     - Scheduling recurring events
   - Integration of a calendar Extra features:
     - Event waitlist features
     - Management of event capacity
     - Talk and live Q&A during events
     - Surveys and feedback gathering following the event
2. The Event Registration User Experience:

   - Specific details about the event: When consumers click on an event, they ought to see:
     - complete schedule and description of the event
     - Speaker/trainer biographies and credentials

- ○ Details about the venue (for in-person events)
- ○ Details about access (for online events)
- ○ List of materials (records, handouts)
- Easy registration procedure:
  - ○ Options for registration based on the sort of event: free, premium, and tier pricing
  - ○ a convenient and safe payment gateway
  - ○ email confirmation that includes links to the event and details
  - ○ Calendar integration for events that are registered.

3. Integrations of Systems:

- Integrate permission and authentication with the current user management system.
- Connect to a payment gateway to provide safe and easy transactions.
- Connect calendar systems to schedule events and send out reminders.
- Connect with messaging platforms to receive updates and information about events.

4. Analytics and Reporting:

- Give statistics on registrations, attendance, interaction, and feedback to the event organisers.
- Utilise data to monitor user preferences and behaviour in order to plan future events.

5. Accessibility and User Interface:

- Provide an easy-to-use and intuitive interface for guests and event organisers alike.
- Make sure people with disabilities can access the system.

User $\xrightarrow[\text{1..*}]{\text{Make >}}$ 1..* Comments

- Each user can make zero or many comments
- Each comment can be made from one or many users

User $\xrightarrow[\text{1..*}]{\text{Buy >}}$ 1..* Ticket

- Each user can buy one or many tickets
- Each ticket can be bought from one or many users

User $\xrightarrow[\text{1..*}]{\text{Register >}}$ 1..* Event

- Each user can register for one or many events
- Each event can be registered by one or many users

Event $\xrightarrow[\text{1..1}]{\text{Generate >}}$ 1..* Ticket

- Each event can generate one or many tickets
- Each ticket can be generated from one event

Event $\xrightarrow[\text{1..1}]{\text{Generate >}}$ 1..* Report

- Each event can generate one or many reports
- Each report can be generated from one event

Event $\quad$ 1..1 $\qquad$ Have > $\qquad$ 1..* $\quad$ EventInfo

- Each event can have one or many event information
- Each event information can be from one event

The overall goal of these suggested business principles is to develop an all-inclusive and intuitive event management system that overcomes the existing drawbacks and gives attendees and organisers more authority. The expanded features, easy registration, system integrations, and data insights that this improved system offers can greatly enhance the user experience and increase the number of events that are utilised inside NexScholar.

3.2 Proposed data & transactional

Proposed Data:

- User: Identifies the people utilising the system, most likely staff, instructors, and students. Includes userID, name, email address, affiliation (student, faculty, staff).

- Event: Describes the different gatherings that NexScholar hosts or participates in. Includes eventID, title, description, date, time, location, format (in-person, online, hybrid), type (seminar, workshop, etc.), audience, speaker/trainer information, registration options (free, paid).

- Event Information: Contains specifics about each event, like the name, description, date, time, and venue, as well as information about the speaker or trainer. Includes additional details specific to each event, such as agenda, materials list (handouts, recordings), access links (for online events), and capacity information.

- Ticket: Keeps track of attendees for paid events for registered users. Includes ticketID, userID, eventID, price, purchase date.

- Comment: Enables people to share their thoughts and opinions about happenings. Includes commentID, userID, eventID, timestamp, and the actual comment text.

- Report: Offers a range of user interaction and event performance data and insights. Includes Report type (registrations, attendance, engagement, feedback), timeframe, data visualizations, and key insights.

Data Entry:

- User:
  - When registering as a new user, provide your name, email address, affiliation, and password.
- Event:
  - Organising brand-new events that include pertinent details such as the title, description, date, time, venue, format, type, audience, speaker/trainer information, registration options, and more.
  - Uploading the handouts and recordings from the event.
- Ticket:
  - Creating tickets for events that need payment and associating them with user and event IDs, costs, and purchase dates.
- Comment:
  - Encouraging people to leave text and time stamped comments on happenings.
- Report:
  - Producing event reports with information about registration, attendance, interaction, and feedback.

Data Update/Delete:

- User:
  - Changing personal data (password, affiliation, email, name, etc.).
  - Removing or deactivating user profiles.
- Event:
  - Making changes to the event's information (title, description, time, date, venue, format, etc.).
  - Events are being cancelled.
  - Altering the event's collateral.
- Ticket:
  - Refunding or cancelling tickets.
- Comment:
 - Modifying or eliminating user feedback.

- Report:
  - Updating reports with current information.

Data Queries:

- Users:
  - Obtaining user lists according to certain criteria (participation at events, affiliation, etc.).
  - Looking over each user's profile.
- Events:
  - Finding events by using different search parameters (title, keywords, date range, type, format, audience).
  - Viewing comprehensive event details, such as comments, reports, materials, and event information.
- Tickets:
  - Monitoring event attendance and ticket sales.
- Remarks:
  - Outputting remarks regarding particular occurrences.
- Reports:
  - Creating and examining a range of reports regarding user interaction and occurrences.
  - Examining user behaviour and event performance.

4.0 Database conceptual design

4.1 Conceptual ERM
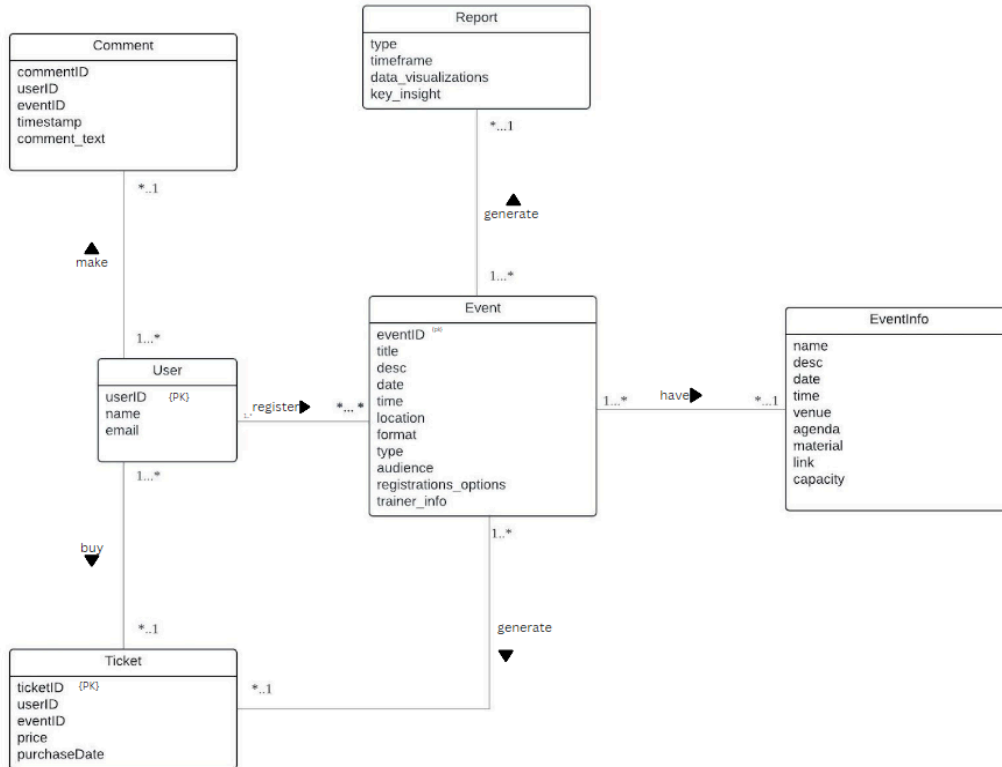
4.2 Enhanced ERD (EERD)
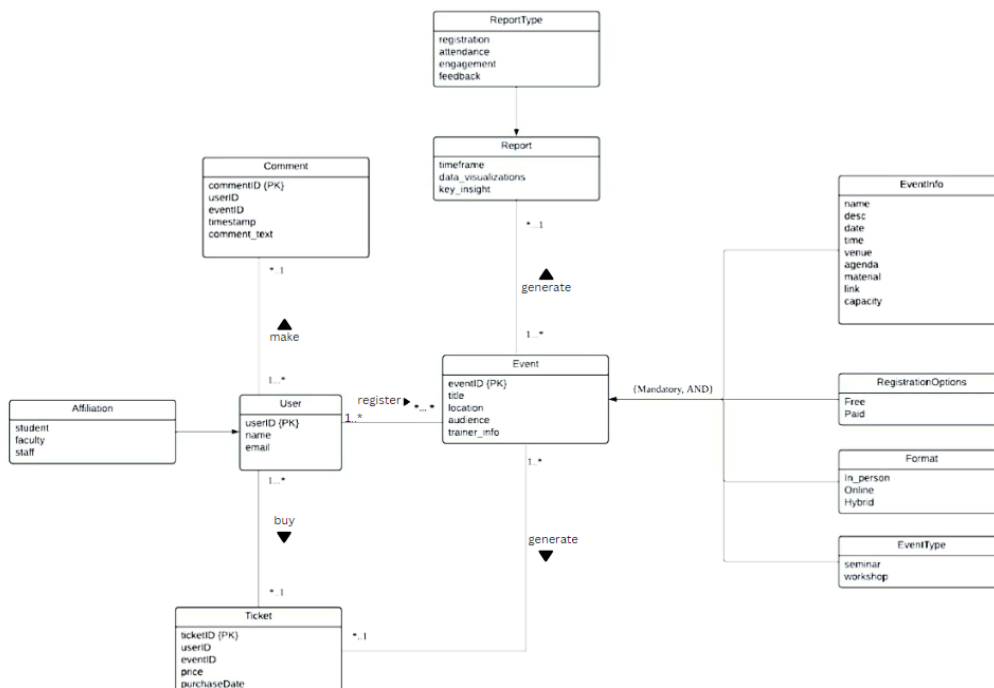
5.0 Data dictionary

Entity Name	Multiplicity	Relationship	Entity Name	Multiplicity
User	1…* 1…* 1…*	makes buys registers	Comment Ticket Event	*…1 *…1 *…*
Event	1…* 1…* 1…*	generates have generate	Report EventInfo Tickets	*…1 *…1 *…1

Entity Name	Attributes	Description	Data Type & Length	Null	Multi-Valued
User	userID name email	Unique user identification User name User email	5 variable char 15 variable char 15 variable char	No No No	No No No
Comment	commentID userID eventID timestamp comment_text	Unique comment identification Unique user identification Unique event identification Comment timestamp Comment text content	5 variable char 5 variable char 5 variable char 8 variable char 100 variable char	No No No No No	No No No No No
Ticket	ticketID userID eventID price purchaseDate	Unique ticket identification Unique user identification Unique event identification Ticket price Ticket purchase date	5 variable char 5 variable char integer 8 variable char	No No No No No	No No No No No
Event	eventID title desc date time location format type audience registrations_options trainer_info	Unique event identification Event title Event description Event date Event time Event location Event format Event type Event audience Event registration options Event trainer info	5 variable char 20 variable char 100 variable char 8 variable char 8 variable char 20 variable char 20 variable char 10 variable char 10 variable char 10 variable char 20 variable char	No No Yes No No No No No No No No	No No No No No No No No No No No

Report	type	Report type	10 variable char	No	No
	timeframe	Report timeframe	8 variable char	No	No
	data_visualizations	Report data visual	20 variable char	No	No
	key_insight	Report insights	20 variable char	No	No
EventInfo	name	Event name	20 variable char	No	No
	desc	Event description	100 variable char	Yes	No
	date	Event date	8 variable char	No	No
	time	Event time	8 variable char	No	No
	venue	Event venue	20 variable char	No	No
	agenda	Event agenda	20 variable char	Yes	No
	material	Event material	100 variable char	Yes	No
	link	Event link	20 variable char	Yes	No
	capacity	Event capacity	integer	No	No

6.0 Summary

In summary, the plan for our event system for NexScholar is discussed in this study with a focus on essential requirements and flows between our entities and functionalities.

The data and transactional needs are described in the project. Moreover, the Data Flow Diagrams (DFDs) are used to show how data moves through the NexScholar Event System's processes, data storage and external entities from input to output. The database design is represented visually by the Entity Relationship Diagram (ERD) and Enhanced Erd (EERD).

Furthermore, with its extensive reference handbook, the Data Dictionary lists important entities, attributes, descriptions, data types and lengths for the system, this includes User, Comment, Ticket, Event, Report, EventInfo.

Lastly, to ensure the efficient operation of the system, this phase introduces a comprehensive system on the interactivity and the entities state while co-existing. It includes business rules, data flow diagrams, conceptual and enhanced ERDs and a comprehensive data dictionary.