**Gym Database Application**

**- Project report -**

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1. **Introduction:**

Our project is centered around the development of an efficient database management system tailored for a gym environment. Concluding our efforts, we have successfully implemented a user-friendly and effective database management system, in the form of a website, that is easy to use for both employees and customers. This report offers an overview, providing a detailed description of our project, outlining the division of responsibilities within our team, addressing the challenges faced throughout the process, and highlighting the lessons learned.

1. **Project description:**

***Introduction to the Gym Environment:***

In the dynamic environment of a modern gym, effective data management is important for streamlined operations and enhanced customer experience. Gyms handle diverse data sets; customer profiles, membership details, session schedules, equipment maintenance logs and employee’s details . A robust Database Management System (DBMS) is necessary because there is a lot of data, and it is complex. An efficient DBMS not only ensures the seamless organization of information but also contributes to optimizing various aspects of gym operations, including membership management, session scheduling, and equipment maintenance.

Knowing how customer data, training schedules, and managing the facility all work together is important in making a DBMS that not only meets but goes beyond what the gym needs. The goal is to make a central system that helps gym staff easily get, change, and use data, making the gym work better and provide better service.

***Project Objectives:***

Our DBMS project is centered on creating a comprehensive and user-friendly database application customized for the specific requirements of a gym environment. The scope involves managing customer data, membership details, training sessions, equipment maintenance, and administrative functionalities. The project addresses challenges related to diverse data types, ensuring a cohesive and efficient data management system.

***Objectives:***

* **Customer Management**: Develop a system for maintaining accurate and up-to-date customer profiles, encompassing registration details and contact information.
* **Membership Tracking**: Implement a mechanism for tracking memberships, covering payment information, accepted payment types, and membership durations.
* **Session Scheduling**: Create a module for scheduling training sessions, ensuring proper coordination between trainers, training spaces, and enrolled customers.
* **Equipment Maintenance**: Establish a system for tracking equipment details, managing maintenance schedules, and logging technician interventions.
* **Administrative Functions**: Implement administrative features, including user roles, feedback management, and space allocation.
* **Usability and Performance**: Prioritize user-friendly interfaces and optimize the system's performance for a seamless experience for both gym staff and customers.

***System Design and Functionality:***

Our paramount focus in the system design is on creating a user-friendly web interface that ensures a seamless and intuitive interaction for both employees and customers. The design principles revolve around simplicity, accessibility, and clarity.

***Key Design Features:***

1. **Minimalistic and Clean Interface:**

Our web interface boasts a minimalistic and clean design, reducing clutter and presenting information in a clear and organized manner. This aesthetic choice enhances user engagement and facilitates easy navigation through different sections of the application.

1. **Login Buttons:**

Upon landing on the homepage, users are greeted with two distinct login buttons—one catering to customers and the other for employees. This intentional contrast emphasizes the tailored experiences each group will encounter within the application.

1. **Customer Portal:**

* *View Customer Details*: Customers are empowered to view and manage their personal details like contact details.
* *Session Overview*: A dedicated section allows customers to access information about their training sessions, providing details on upcoming sessions.
* *Feedback Submission*: Customers have the convenience of providing feedback directly through the interface, fostering effective communication between customers and the gym management.

1. **Trainer Dashboard:**

* *Trainer Details*: Trainers can access and update their personal details (contact) through the interface.
* *Session Management*: The dashboard provides insights into upcoming sessions, allowing trainers to plan and prepare effectively.

1. **Technician Console:**

* *Technician Details*: Technicians gain access to their personal details and relevant information.
* *Equipment Management*: Technicians can view the equipment they have previously checked, as well as identify equipment requiring attention. They can select specific items for maintenance, streamlining the process.

1. **Admin Hub:**

* *Admin Profile*: Administrators can review and update their personal details.
* *Office Information*: Access to office-related information, including details about the office space, working hours, and other relevant data.
* *Feedback Tracking*: Admins can efficiently manage and review customer feedback, fostering a responsive and customer-centric approach.

In summary, our user-friendly web interface is a gateway to a tailored and efficient experience for each user category, promoting accessibility, clarity, and ease of use. Through intentional design choices, we aim to enhance the overall functionality of the gym's database management system.

***Security Measures:***

***Identity Verification through Database Views:***

Each user type, whether it's a customer, admin, technician, or trainer, is associated with a specific database view. This granular approach ensures that users only have access to information and functionalities relevant to their roles.

***Password Hashing:***

To fortify our system against potential breaches, all passwords stored in our database undergo a secure hashing process. Hashing adds an additional layer of protection by converting passwords into complex, irreversible strings. This measure ensures that even in the event of a data breach, sensitive information remains unintelligible to unauthorized parties.

1. **Team responsibilities:**

**Deliverable 1:**

During the initial deliverable, we frequently met to discuss and concurrently wrote our points on the shared document "*um6p-cs-introdb-project1-requirements.docx*." The ERD was created collaboratively using the platform "*app.diagrams.net*." All team members actively participated in the work, ensuring a joint effort.

**Deliverable 2:**

For the new ERD, modifications were made concurrently through discussions on the "*app.diagrams.net*" platform. The responsibilities for specific documents were assigned:

Ikram Benfellah took charge of "*um6p-cs-introdb-project1-erd-new.docx*" and the report; Malak Kably handled "*um6p-cs-introdb-project1-schemas.docx*" and "*um6p-cs-introdb-project1-fds.docx.*" DDL and DCL queries were a collaborative effort, with Elghali Benjelloun managing the SQL and error handling. Data generation started with Ikram Benfellah and Malak Kably but later transitioned to Yassine Blali, who utilized Python scripts with assistance from Malak Kably. DML commands were handled jointly by Ikram Benfellah and Elghali Benjelloun, with Elghali Benjelloun managing errors. Elghali Benjelloun also handled the logs with assistance from Malak Kably. She also ensured uniformity in document aesthetics.

**Deliverable 3:**

For the database application, Kably Malak managed the frontend of the homepage and login page, while Elghali Benjelloun handled the backend. The team divided tasks: Ikram Benfellah for customer pages, Yassine Blali for admin pages, Kably Malak for the trainer part, and Elghali Benjelloun for the technician part. Elghali Benjelloun organized all parts according to an agreed folder structure. Ikram Benfellah managed performance evaluation, and Kably Malak worked on "*um6p-cs-introdb-project1-report.docx*" and the README.

**Deliverable 4:**

Yassine Blali took charge of the demo video, and the presentation was a collaborative effort. Each team member contributed to their respective parts, and communication occurred via our WhatsApp group whenever assistance or discussion was needed.

1. **Challenges faced:**

In this section, we'll discuss the difficulties we faced in our project. We'll break them down into two types: technical challenges related to various aspects of our work, and personal challenges dealing with teamwork, communication, and time management. Let's take a closer look at each type and how we tackled them.

**Technical challenges:**

1. **Trigger Redundancy**:

* *Problem*: The inability to directly use the CURDATE () function in a "CHECK constraint" in MySQL.
* *Solution*: Created triggers to perform date checks. However, duplicating triggers for different tables or columns proved inefficient.

1. **Generating Data**:

* *Problem*: Existing data generation tools (Mockaroo, data generator, FillDB) were inadequate for producing the required amount of data and ensuring proper foreign key and functional dependency adherence.
* *Solution*: Developed custom Python scripts to generate data, ensuring accuracy in relationships and meeting business rules. This approach allowed for precise control over data creation.

1. **Learning a New Language (PHP):**

* *Problem*: The need to implement an interface using PHP, a language not previously studied in the curriculum.
* *Solution*: Leveraged existing knowledge of HTML and CSS, learning PHP concurrently during the interface development. This hands-on approach enabled the team to overcome the language barrier and comprehend the importance of referential integrity in the database.

**Operational challenges:**

1. **Adapting to Different Timelines**:
   * *Problem*: The team members had diverse daily routines with sports sessions, varying sleep times, exams, and assignments, making it challenging to find suitable work hours.

* *Solution*: After experimenting with different schedules, the team settled on meeting after sports sessions at 10 PM on weekdays. However, working late negatively impacted productivity due to decreased alertness.

1. **Conflicting Opinions on Handling Tasks**:

* *Problem:* As we progressed, we faced situations where team members had different ways of doing things, like organizing the application folder.
* *Solution*: To solve this, we started voting on different approaches. This way, everyone could share their thoughts, and we could decide together on the best way forward.

1. **Lessons learned:**

**Collaboration is Key:**

Working together is more effective than attempting to tackle tasks individually. The diversity of ideas from a group surpasses what one mind can generate. This collaborative environment not only encouraged creativity but also taught us essential skills such as flexibility and the ability to accept and integrate others' opinions.

**Real-Life Experience:**

At the beginning, we collaborated with a real-life client; however, we couldn't complete the project due to their delayed responses and lack of responsiveness. Nevertheless, this experience provided us with valuable insights into the workings of the professional world, offering a glimpse into the challenges, including delays, that can be encountered in a real job scenario.

**Enhanced Skills Through Practice:**

The practical application of our knowledge emphasized the importance of hands-on and practical experience. Real-world practice not only solidifies theoretical understanding but also cultivates a deeper mastery of specific tasks. Indeed, the project significantly enhanced our skills in the database management module, highlighting the value of practical experience and enabling us to excel in various tasks.