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# **Information System Project: Learning Management System**

**GROUP: 2**

**LECTURER: DR. SOLA EDAGBAMI**

**COURSE: CSC 419**

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# **TEAM MEMBERS**

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**Project Duration:**

* **Start Date:** December 9th, 2024
* **End Date:** [End Date]

### **Abstract**

This project focuses on developing a **Learning Management System (LMS)** to improve online teachings and learning. The LMS provides a simple and accessible platform where teachers can register, upload course materials, and manage content, while students can browse, enroll in, and study courses at their own pace.

The system was built using ReactJS with Vite for the front end and Node.js with MongoDB for the back end, ensuring a smooth and efficient user experience. GitHub was used for version control and collaboration among the 12-member team, with regular code reviews to maintain quality and security.

The project was completed in phases, starting with user authentication, followed by front-end and back-end development, and ending with testing and deployment. The team faced challenges such as skill gaps, technical integration issues, and coordination difficulties. These were addressed through teamwork, regular meetings, and continuous learning.

The final LMS successfully supports online learning by offering a secure, user-friendly, and scalable platform. Future improvements could include real-time discussions, automated grading, and AI-based course recommendations to further enhance the learning experience.

Future enhancements may include **real-time discussions, automated grading, and AI-driven recommendations**.

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# **Executive Summary**

This report documents the collaborative efforts of our 12-member team in developing an Information System, specifically a Learning Management System (LMS), designed to enhance online teaching and learning experiences. The LMS provides a platform where teachers can register and upload course content, making it accessible to students who can enroll in and study any course of their choice.

**Key Points:**

* **Project Duration:** December 9th, 2024 – [End Date]
* **Technological Stack:**
  + **Front End:** HTML, SCSS, ReactJS with Vite
  + **Back End:** Node.js, MongoDB
  + **Collaboration:** GitHub, with strict review protocols ensuring security and quality.
* **Team Dynamics and Collaboration:** The project relied heavily on teamwork and constant communication, with scheduled meetings twice weekly, supplemented by calls, texts, and one-on-one interactions when necessary. Every team member contributed significantly, with Temi (front-end routing) and Samuel (back-end API development) providing critical technical support.
* **Educational Functionality:**
  + Teachers can register and upload courses easily.
  + Students have seamless access to available courses, selecting and studying at their convenience through intuitive dashboards.
* **Execution and Adaptation:** The team executed the project in phases, beginning with foundational login functionalities and moving into simultaneous front-end and back-end development. Flexibility was critical, as the team adjusted to unforeseen challenges and skill gaps effectively.

The LMS successfully achieved its educational objectives, allowing flexible and accessible online learning. Through teamwork and continuous collaboration, each member developed new skills, strengthened existing ones, and gained valuable insights for future projects.

Despite challenges such as **varying skill levels and technical integration issues**, the team effectively utilized **collaboration, structured meetings, and continuous learning** to develop a functional system. The project was executed in phases, beginning with **user authentication** and culminating in a **fully operational LMS**.

**System Functionality Overview**

The **LMS** provides the following functionalities:

### **User Roles & Authentication:**

* **Teachers:**
  + Register and log in securely
  + Create courses and upload materials (PDFs, videos, quizzes)
  + Manage course content and student enrollment
* **Students:**
  + Sign up and log in
  + Browse available courses and enroll
  + Access structured learning materials (videos, readings, quizzes)

### **Dashboard & Course Interaction:**

* **Teachers’ Dashboard:**
  + Manage uploaded courses
  + View student progress and engagement statistics
* **Students’ Dashboard:**
  + Track enrolled courses and progress
  + Engage with course materials

### **Security & Data Management:**

* **Secure authentication system (JWT-based)**
* **Role-based access control**
* **Real-time database updates for course progress tracking**

# **1. Introduction**

This report describes the creation of a Learning Management System (LMS) as part of an Information System project assignment. Our team of twelve students worked together to build a platform where teachers and students can interact through online courses.

Given the flexibility to select any type of information system, the team agreed on an LMS to address educational needs. The system allows teachers to register and upload courses, while students can easily access, select, and study these courses.

The project used web technologies such as ReactJS and Vite for the front end, Node.js and MongoDB for the backend, and GitHub for secure collaboration. Regular meetings were held primarily on Tuesdays and occasionally on Fridays. Team members communicated frequently via texts and calls to clarify issues and collaborate effectively.

During the project, the team faced challenges including skill gaps, technical problems, and coordination difficulties. Working together, the team overcame these challenges, improving both technical and teamwork skills.

This report provides details of the project, highlighting technical achievements and the importance of teamwork in meeting our objectives.

# **2. Project Overview**

The LMS developed by our team provides a user-friendly platform for teachers and students. Teachers can register on the system and upload course materials, including documents, videos, and quizzes. Students can browse available courses, enroll in courses they find interesting, and access all related materials.

The system includes secure user authentication, ensuring that only registered users can access courses and personal information. The interface was designed to be intuitive, allowing smooth navigation between courses, lessons, and assessment tools.

Technologically, the project combined front-end and back-end components effectively. ReactJS and Vite allowed the team to create responsive and interactive user interfaces. Node.js and MongoDB were used to handle data storage and management efficiently. GitHub facilitated structured and secure collaboration among the team members.

Regular communication, structured collaboration, and a clear project vision enabled the team to complete the project successfully despite encountering various challenges. This section provides a summary of how the LMS functions, the key technologies used, and the teamwork involved in delivering the final product.

# **3. Technical Architecture and Implementation**

The technical architecture of the LMS includes clearly defined front-end and back-end components, integrated seamlessly to ensure smooth performance and scalability.

### **Front-End Development**

The front end of the LMS was built using ReactJS and Vite. ReactJS allowed us to create modular, reusable UI components, improving maintainability and ease of updates. Vite provided rapid development and optimized build processes, making it easier to test and deploy changes quickly.

Temi managed front-end routing, ensuring efficient navigation throughout the platform. Richard and Nifemi contributed significantly to UI design, particularly the intuitive login and registration pages. James and Olympia worked collaboratively on creating interactive dashboards and user-friendly course pages.

### **Back-End Development**

The backend was developed using Node.js and MongoDB, providing efficient and scalable server-side functionality. Samuel led backend development, particularly API creation, managing critical aspects such as user authentication and course data management. Blossom, who transitioned from PHP to Node.js, provided substantial backend assistance, addressing technical issues and supporting database operations.

### **Collaboration and Version Control**

The team utilized GitHub for collaborative coding, employing a structured review process to maintain high code quality and security. Team members regularly reviewed each other's contributions, ensuring that issues were identified and resolved promptly.

# **4. Collaboration and Team Dynamics**

Regular meetings were held primarily on Tuesday evenings and occasionally Fridays. Communication continued consistently outside scheduled meetings through texts and calls. Temi and Samuel offered reliable technical support, while James coordinated the dashboard and frequently consulted teammates for feedback. Olympia provided consistent front-end support, with Richard and Nifemi enhancing the user interface.

Blossom, Austine, Leye, and Ndubisi effectively supported various project aspects, adapting roles as needed. The ongoing collaboration and clear communication among all members significantly contributed to the project's success.

# **5. Project Execution and Milestones**

The project was executed in clearly defined phases to manage progress and handle challenges effectively:

### **Phase 1: Planning and Foundation**

* Initial meetings and decision on building an LMS.
* Team formation, role assignments, and setup of initial project structure.
* Development of secure login API as the foundational component.

### **Phase 2: Parallel Development**

* Simultaneous front-end and back-end development, facilitated by continuous communication.
* Regular integration meetings to ensure alignment between components.
* Significant advancements in routing, dashboard development, and backend API integration.

### **Phase 3: Testing, Refinement, and Deployment**

* Thorough testing procedures were performed to detect and resolve issues promptly.
* Final refinements based on testing results and user feedback.
* Successful pilot deployment with user feedback incorporated to enhance usability and functionality.

# **6. Challenges, Adaptations, and Lessons Learnt**

Throughout the project, the team encountered and addressed several challenges:

### **Skill Gaps**

* Different skill levels within the team initially slowed progress.
* Experienced members provided support and mentorship, helping others gain necessary skills quickly.

### **Technical Difficulties**

* Integration between front-end and back-end components occasionally caused technical issues.
* Open communication and structured reviews quickly addressed and resolved these technical challenges.

### **Coordination and Communication**

* Initial challenges in coordinating the large team were resolved through regular meetings and ongoing communication via texts and calls.

### **Lessons Learned**

* Clear communication, structured roles, and effective use of each member’s strengths are crucial.
* Flexibility and adaptability to unforeseen challenges ensure smoother project execution.

# **7. Conclusion**

The Learning Management System project successfully achieved its objectives through effective teamwork, technical proficiency, and adaptability. The system meets essential educational needs by providing teachers and students with a practical, secure, and user-friendly online platform.

The project enhanced our technical skills, teamwork, and problem-solving abilities. Each team member contributed significantly, demonstrating the value of clear communication, adaptability, and mutual support in achieving shared goals. The experiences gained during this project have prepared us well for future collaborative and professional endeavors.