

IS2901 - Software Development Project

Project Proposal



Department of Interdisciplinary Studies
Faculty of Information Technology
University of Moratuwa

2024

Group Name	SyntaxStorm	
Project Name	Enterprise Learning Management System (LMS)	
Client's name and address	ExcelllyGen Labs (pvt.) Ltd. 440B,Batama South, Kadana, Sri Lanka	
Group Members	Index No	Name
	225128K	B.G.A.U. Deshapriya
	225089N	R.A.M.R.Ranawaka
	225077C	P.G.S.Nirodya
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	225047K	Kahawalage D.I.
Supervisors' names	1. Ms. M.B. Mufitha 2. Ms. M.N. Chandimali	

1. Introduction

In the current dynamic corporate environment, ongoing staff education, development, and effective organizational management are essential for organizational success. Organizations encounter the problem of providing their employees with the requisite skills to adjust to emerging technologies, market dynamics, and consumer expectations while ensuring streamlined management processes to enhance productivity and efficiency. This proposal presents a complete and engaging solution through the introduction of a bespoke Enterprise Learning and Management System (L&MS) for ExcellGen.

This L&MS will offer a unified platform for employees to access a variety of learning resources, including courses, videos, and interactive assessments, discussion forums while also providing robust management tools for administrators to oversee and optimize workforce operations. The suggested L&MS aims to establish a dynamic, efficient, and cohesive environment by utilizing contemporary technologies such as React for an intuitive interface and .NET Core for a resilient backend.

2. Problem in brief

In the highly competitive and innovation-driven software industry, maintaining a skilled and adaptable workforce is a critical challenge. Companies like ExcellGen and other software firms often struggle with outdated training and management methods that fail to meet the demands of a rapidly changing technological landscape. Traditional methods are not only costly but also lack flexibility, engagement, and robust management capabilities, leading to inefficiencies and skill gaps.

Key issues include:

- **Skill Disparities:** Rapid advancements in technology make it difficult for employees to stay updated, leading to gaps in critical skills required for success.
- **Inconsistent Training Access:** Unequal distribution of training opportunities creates disparities in employee performance and growth.
- **Low Engagement Levels:** Conventional training methods often lack interactive and motivational elements, leading to reduced employee participation.
- **Difficulty in Tracking Progress:** Without a centralized system, it becomes challenging to monitor and evaluate training outcomes effectively.
- **Ineffective Management Processes:** Lack of a unified platform for managing employee data, project assignments, and performance evaluations creates administrative bottlenecks and reduces operational efficiency.

An Enterprise L&MS is no longer a luxury but a necessity for software companies aiming to maintain their competitive edge. It enables organizations to upskill their workforce, streamline management processes, foster a culture of continuous learning, and enhance operational efficiency. By addressing these pain points, the proposed L&MS will empower ExcellGen and similar firms to thrive in a dynamic market.

3. Aim and Objectives

Aim: To develop a comprehensive Enterprise Learning & Management System (L&MS) for ExcellGen, designed to address the challenges of workforce training and organizational management, using innovative technologies and modern learning methodologies.

Objectives:

1. Establish a centralized platform for diverse learning resources, enabling streamlined access for employees.
2. Enhance engagement through gamified learning experiences, interactive courses, and rewards such as badges and certificates.
3. Enable self-paced and personalized learning pathways with robust progress tracking features.
4. Simplify management processes by integrating role-based access control, employee data management, and performance monitoring.
5. Provide advanced analytics and dashboards for tracking employee progress, skill gaps, and organizational learning trends.
6. Facilitate integration with external content marketplaces like LinkedIn, Coursera, and Udemy to offer diverse learning materials.
7. Implement AI-powered video search, discussion forums, and dynamic CV generation to enhance employee learning and development.
8. Incorporate multilingual support to cater to a global workforce and ensure accessibility for all employees.
9. Enable administrators to efficiently manage and update learning content, monitor employee progress, and generate insightful reports.
10. Foster a culture of continuous learning by leveraging modern tools and technologies to empower both employees and management.

4. Proposed Solution

The proposed Enterprise Learning & Management System (L&MS) is designed to address training and management challenges by incorporating key features that ensure a comprehensive, engaging, and effective platform for employees and administrators. Below is a concise description of its core features:

1. **Course Library:**
A diverse repository of courses covering technical skills, leadership, and professional development. Employees can select relevant courses, track their progress, and use certifications to advance their careers within the organization.
2. **Interactive Quizzes:**
Integrated quizzes, including multiple-choice and short answers, allow employees to test their knowledge in real time. Supervisors can analyze quiz results to identify knowledge gaps and provide targeted feedback.
3. **Customizable Learning Paths:**
Administrators can design personalized learning paths for employees based on their roles. For example, Software Engineers may focus on advanced coding, while Project Managers might follow a curriculum on stakeholder management.
4. **Certifications and Recognition:**
Employees earn dynamically generated certifications and badges upon course completion. These are displayed in dashboards and contribute to a leaderboard system that promotes healthy competition.
5. **Admin Tools:**
Features like role management, course creation, and advanced reporting simplify administration. Analytics dashboards enable tracking of employee performance and system utilization.
6. **Skill Gap Analysis:**
AI-powered tools compare employee competencies to industry benchmarks, offering personalized learning recommendations to address skill gaps with content from platforms like LinkedIn Learning and Udemy.
7. **Employee Management System:**
Managers can oversee employee details, assign projects, monitor bench status, and manage skills availability through an integrated system.
8. **AI-Driven Enhancements:**
Advanced AI functionalities such as video captioning, subtitle generation, and interactive transcripts allow employees to efficiently search and navigate video content, saving time and improving learning outcomes.
9. **Interactive Discussion Forums:**
Forums foster communication and collaboration, enabling employees to ask questions, exchange ideas, and engage with their peers and experts.

4.1 Technology to be Adapted:

- **Frontend (React):** React is a modern JavaScript library for building dynamic and interactive user interfaces. Its component-based architecture ensures a modular, maintainable frontend, providing a seamless user experience across various devices.
- **Backend (.NET Core):** A high-performance, cross-platform framework ideal for developing robust and scalable web applications. .NET Core will handle essential backend functions such as user authentication, data management, API integrations, and business logic.
- **Database (PostgreSQL):** PostgreSQL is a powerful open-source relational database management system known for its reliability, data integrity, and scalability. It will store critical information, including user data, course content, and learning progress.
- **Cloud Hosting (Azure):** Microsoft Azure will provide the infrastructure for hosting the L&MS, ensuring high availability, scalability, and security. Services like Azure Blob Storage will be utilized for storing video content and other learning materials.
- **Reporting and Analytics (Power BI / React-based charts):** The system will integrate Power BI for advanced analytics and reporting. Additionally, React-based charting libraries will be employed for interactive, real-time visualizations to support administrators and stakeholders in data-driven decision-making.

4.2 Nature of Solution:

- **Input:** The system will accept user inputs such as course content, video uploads, user data, and learning path configurations. Administrators can make learning paths, get employee reports, assign role-based access (RBA), and maintain the system. Course coordinators can create and update training materials and also track learners' progress.
- **Process:** The L&MS processes this data to facilitate dynamic learning paths, real-time progress tracking, skill gap analysis, and personalized learning recommendations. Built-in AI algorithms will further enhance the efficiency and accuracy of the system by automating tasks like video indexing, transcript generation, and content recommendations.
- **Output:** Users will receive outputs such as certificates of course completion, progress reports, interactive dashboards, and performance analytics. Administrators will gain insights through comprehensive reporting tools, predictive analytics, and employee management features.
- **Users:** The primary users of the system will be ExcellGen employees (learners), course coordinators (supervisors) and system administrators (HR, trainers, managers).

4.3 Feasibility of Implementation:

- **Proven Technology Stack:** The selected technologies—React for the frontend, .NET Core for the backend, PostgreSQL for database management, and Microsoft Azure for cloud hosting—are widely used and supported in the software industry. Their robustness, scalability, and reliability make them ideal for developing and maintaining a complex system like the L&MS.
- **Team Expertise:** The project team is equipped with the necessary skills and experience to work with the chosen technologies. The division of tasks among team members ensures efficient use of resources and adherence to timelines.
- **Availability of Resources:** Tools, libraries, and frameworks required for development are readily available and well-documented, which minimizes development risks and accelerates the implementation process.
- **Scalability:** The system is designed with scalability in mind. The use of cloud hosting through Azure ensures that the L&MS can handle increased user loads and expanded functionalities without compromising performance.
- **Cost-Effectiveness:** Leveraging open-source tools like PostgreSQL and cloud infrastructure like Azure reduces initial investment and maintenance costs. This makes the solution affordable while still offering enterprise-grade reliability and security.
- **Integration Capabilities:** The system can seamlessly integrate with third-party platforms such as LinkedIn Learning and Udemy, enhancing the variety and quality of learning resources available to employees.
- **User-Centric Design:** The modular and component-based architecture of React enables the creation of a highly intuitive and responsive user interface, ensuring that both administrators and learners can navigate the system effortlessly. The proposed LMS directly addresses the identified problems by:

4.4 Capability to Solve the Problem:

The proposed LMS directly addresses the identified problems by:



- **Centralized Learning Platform:**
Combines all learning materials into one hub, ensuring equal access and eliminating inconsistencies.
- **Self-Paced and Personalized Learning:**
Provides flexible, role-specific learning paths, enhancing employee engagement and productivity.
- **Progress Monitoring and Feedback:**
Uses tracking tools and AI analytics for actionable insights into learning outcomes and skill gaps.
- **Streamlined Administrative Management:**
Simplifies management tasks with tools for data handling, training design, and report generation.
- **Enhanced Engagement through Gamification:**
Incorporates interactive features like quizzes and badges to motivate employees and boost participation.
- **AI-Driven Efficiency:**
Employs AI tools for video search, transcript generation, and skill gap analysis to enhance learning processes.
- **Seamless Integration with Industry Platforms:**
Expands learning resources by integrating with external platforms like LinkedIn Learning and Coursera.
- **Scalability and Accessibility:**
Ensures growth and inclusivity through scalable technologies, cloud hosting, and multilingual support

5. Timeline

Phase 1: Requirements Gathering and Planning (November 27th, 2024 - December 15th, 2024)

- Detailed requirement analysis: Finalize the scope of features, user roles, and functionalities of the LMS.
- Technology stack confirmation: Confirm the chosen technologies (React, .NETCore, PostgreSQL, Azure) and any third-party integrations.
- Project plan creation: Develop a detailed project plan with tasks, timelines, and resource allocation.
- UI/UX design: Design React.js for the initial set of front-end pages.

6. Signatures of group Members

Index No	Name	Signature
225128K	B.G.A.U. Deshapriya	
225089N	R.A.M.R.Ranawaka	
225077C	P.G.S.Nirodya	
225130J	U.S.D.Silva	
225047K	Kahawalage D.I.	

7. Supervisors' declaration

I hereby declare that I have checked this project and, in my opinion, this project is adequate in terms of scope and quality

1. Name of Supervisor: **Ms. M.B. Mufitha**

Designation:

Date:

Signature:

Any further comments:

2. Name of Supervisor: **Ms. M.N. Chandimali**

Designation:

Date:

Signature:

Any further comments: