Skill-Synergy (A Cloud-Based E-learning Platform)

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Abstract

This paper introduces an innovative approach to address global education disparities through the development of a hybrid e-learning platform. By merging Waterfall and Agile methodologies, we prioritize comprehensive requirements collection, including Program and Course Learning Outcomes (PLOs and CLOs). Our platform, leveraging cloud technology, aims to provide universal access to quality education, offering diverse courses, virtual classrooms, and analytics tools. Through iterative testing and user feedback loops, we ensure alignment with educational goals and real-time collaboration. We assess the platform's impact on underserved communities and its contribution to Sustainable Development Goal for Quality Education.

Introduction

Our project is focused on tackling the issue of ensuring that everyone has access to quality education. We propose a web platform (E-learning website) that utilises cloud technology to offer courses, educational materials, and virtual classrooms. This website will allow students from any background to have opportunities for top-notch education, enabling them to learn at their convenience and from any location. By using cloud technology, we aim to provide access to educational content regardless of where users are or what devices they use. The platform will feature engaging learning modules covering a range of subjects to suit learning preferences. Furthermore, it will promote real-time collaboration between students and teachers in classrooms, creating a learning environment. Educators will benefit from analytics that track student progress and help personalize teaching methods for results. Through the use of technology to expand opportunities, our web platform is set to make progress towards achieving the Sustainable Development Goals (SDGs). By providing quality resources to students, in underserved communities, we aim to bridge the education gap and empower individuals towards realizing their full potential, thereby contributing towards a fairer and more prosperous society.

Methodologies

The project will use an iterative development methodology that combines aspects of the Waterfall and Agile development processes. Comprehensive requirements collection, including the creation of Program Learning Outcomes (PLOs) and Course Learning Outcomes (CLOs), will be part of the initial phases. The creation of PLOs at the program level and the incorporation of CLOs into specific courses will be given top priority in the upcoming development cycles. Throughout the development lifecycle, stakeholder meetings and feedback sessions will be crucial to fine-tuning the application of these learning outcomes.

Cost Analysis

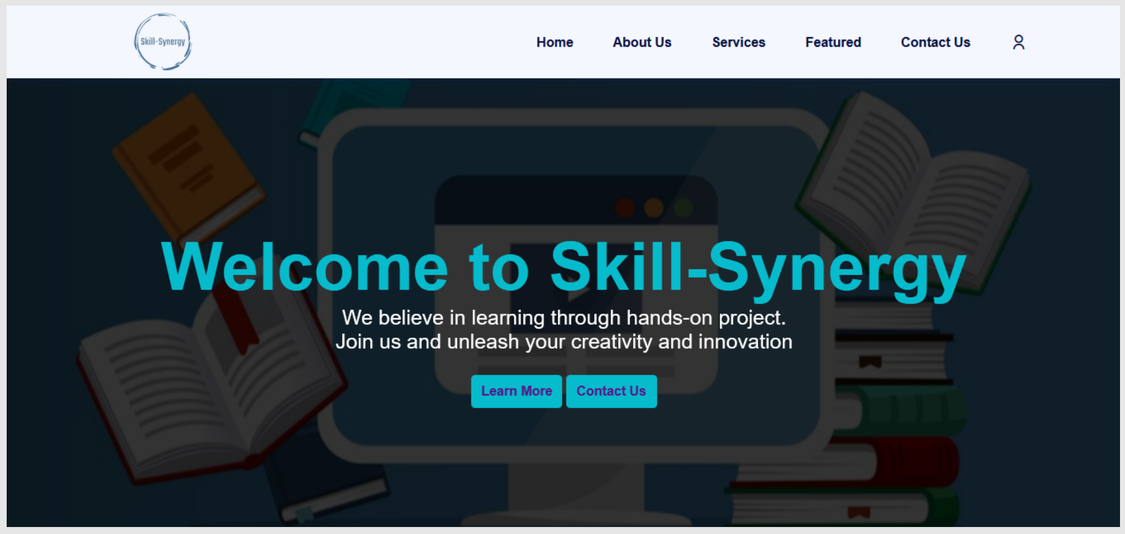
Estimate summary

Upfront cost	Monthly cost	Total 12 months cost
521.64 USD	6,322.30 USD	76,389.24 USD
		Includes upfront cost

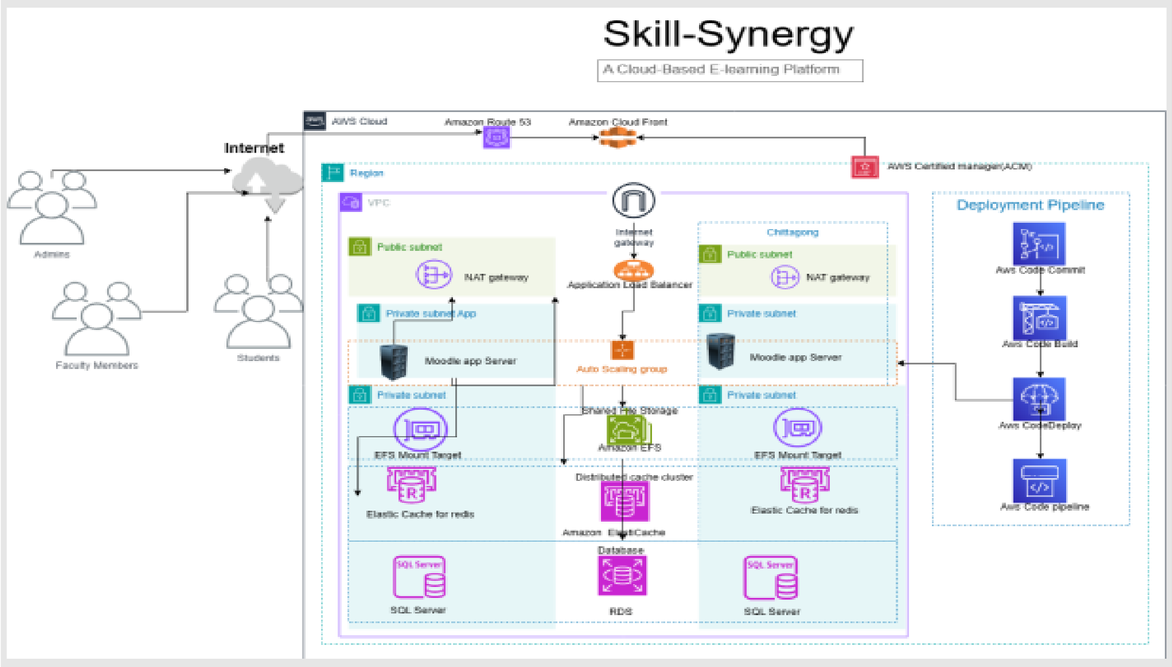
Detailed Estimate

Name	Group	Region	Upfront cost	Monthly cost
Amazon EC2	No group applied	US East (Ohio)	341.64 USD	0.00 USD
Status: - **Description:** **Config summary:** Tenancy (Shared Instances), Operating system (Linux), Workload (Consistent, Number of instances: 5), Advance EC2 instance (t2.micro), Pricing strategy (1yr All Upfront), Enable monitoring (disabled), DT Inbound: Not selected (0 TB per month), DT Outbound: Not selected (0 TB per month), DT Intra-Region: (0 TB per month)				
Amazon DynamoDB	No group applied	US East (Ohio)	180.00 USD	151.14 USD
Status: - **Description:** **Config summary:** Table class (Standard), Average item size (all attributes) (1 KB), Write reserved capacity term (1 year), Read reserved capacity term (1 year), Data storage size (500 GB)				
Elastic Load Balancing	No group applied	US East (Ohio)	0.00 USD	921.63 USD
Status: - **Description:** **Config summary:** Number of Application Load Balancers (1)				
Amazon Elastic Graphics	No group applied	US East (Ohio)	0.00 USD	1,460.00 USD
Status: - **Description:** **Config summary:** Instance type (eg1.2xlarge), Number of nodes (5), Utilization (On-Demand only) (100 %Utilized/Month)				
Amazon Virtual Private Cloud (VPC)	No group applied	US East (Ohio)	0.00 USD	3,789.53 USD

The Website



AWS System Diagram



Implementation

```
function showCOWisePLOGraph() {
    let courseId = document.getElementById("CSECourseSelection").value;
    document.getElementById("chart-container").innerHTML = "";
    createCanvasElement(courseId);

    document.getElementById("chart-container").style.backgroundColor = "#fff";
    let data;

    var xmlhttp = new XMLHttpRequest();
    xmlhttp.onreadystatechange = function() {
        if (xmlhttp.readyState == 4 && xmlhttp.status == 200) {
            data = xmlhttp.responseText.split("-");
            createGraph(data, courseId);
        }
    };
    var url = "";
    url = "./utils/getPLOData.php?courseId=" + courseId;
    xmlhttp.open("POST", url, true);
    xmlhttp.send();
}
```

Real-World Applications

Our e-learning platform, Skill Synergy, aims to bridge global education gaps by providing universal access to quality education. Tailored for underserved communities, it offers diverse courses and resources, empowering individuals regardless of location or socioeconomic status. Flexible learning options cater to diverse needs, benefiting professionals, caregivers, and those with limited mobility. Real-time collaboration fosters dynamic learning environments. Aligned with the Sustainable Development Goal for Quality Education, our platform contributes to a more equitable society and global sustainable development.

Conclusion

The hybrid e-learning platform presents a promising solution to address global education disparities. By leveraging cloud technology and adopting an iterative development methodology, the platform ensures universal access to quality education while promoting real-time collaboration and personalized learning experiences. Further research and implementation efforts are warranted to fully realize the platform's potential impact on achieving equitable education worldwide.