

Vendor Management & SLA Optimization for Educational Digital Platforms

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Abstract— Digital education in India has just boomed to a large extent that education institutions have become highly reliant on third-party vendors to provide technology, content delivery, and infrastructure provision. The paper presents the topic of vendor management and optimization of the Service Level Agreement (SLA) as the means of improving the efficiency, reliability, and scalability of educational digital platforms. The study has the descriptive and exploratory approach where primary and secondary data is gathered on the students, educators, administrators, and vendors. The results indicate that the organized vendor management and the well-established SLA parameters (system uptime, response time, and quality of service) have a great impact on the improved performance of the operations and user satisfaction. Also, Artificial Intelligence and automation in SLA monitoring contributes to minimizing disruptions in the services and increases the responsibility of vendors. Digital divide and absence of standardized structures and limited visibility of operations of vendors are still a challenge though. The research draws the conclusion that a technology-based vendor management system and streamlined management of SLA should be applied to guarantee cost-efficiency, the quality of services, and long-term expansion of digital educational platforms.

Index Terms— Vendor Management, SLA Optimization, EdTech Platforms, Service Quality, Vendor Performance, and Operational Efficiency.

I. INTRODUCTION

The paper is aimed at studying how the issue of vendor management and optimization of Service Level Agreement (SLA) can improve the work of educational digital platforms. As the EdTech industry expands at a rapid rate, more and more of the services provided by third-party companies are purchased by

institutions like learning management systems, content delivery, cloud infrastructure, and technical support. The study is descriptive and exploratory in nature employing both primary and secondary data gathered on the major stakeholders such as students, educators, administrators and vendors. The results have shown that the approach to vendor selection, continuous monitoring of the Performance and proper parameters of SLA (uptime, response time and service reliability) contribute greatly to the operational efficiency as well as user satisfaction. It is also noted in the study that there is an increasing use of Artificial Intelligence and automation to forecast service problems and mitigate SLA violation. Nevertheless, issues like the absence of universal schemes, the digital divide, and poor transparency in the work of the vendors remain. The study concludes that a technology-based, well-organized vendor management system is necessary to guarantee both cost-efficiency and quality of services and long-term development of online learning platforms.

II. DIGITAL EDUCATION STATISTICS IN INDIA

Sr. No	Category	Statistics	Source
1	Total Schools in India	14.72 lakh (1.472 million)	PIB
2	Total Students	24.8 crore (248 million)	PIB
3	Total Teachers	98 lakh (9.8 million)	PIB
4	Schools with Computers	57.2% (up from 38.5% in 2019-20)	PIB
5	Schools with Internet	53.9% (up from 22.3% in 2019-20)	PIB

6	Urban Households with Internet	42%	NSO
7	Rural Households with Internet	15%	NSO
8	Internet Access by State	Delhi - 55%, Kerala & Himachal Pradesh - 50%+, Odisha - 10%	Officers Pulse

Overview Of World Market

The global digital education (EdTech) market has been growing exponentially because of the growth in the penetration of the internet, the growth in technological capabilities, and due to the growing demand of flexible learning solutions. The online education market across the world has been estimated to be USD 30 billion in 2021 and is expected to grow to close to USD 200 billion by 2030 with a compound annual growth rate (CAGR) of approximately 23.

This expansion is fuelled by the intensive use of:

- LMS based on the cloud.
- Personalized learning Artificial intelligence (AI).
- Massive Open Online Courses (MOOCs).
- Professional and corporate upskilling sites.

The digital education platforms around the world are relying heavily on the third-party vendors to:

- Cloud infrastructure (AWS, Azure)
- Content development
- Maintaining and support of platforms.
- Information privacy and legal compliance.

Consequently, optimization of vendor management and SLA have been reduced to essential parts of global EdTech operations. Structured SLAs are employed in organizations to guarantee:

- High system uptime
- Quick response and response times.
- Data security compliance
- Seamless user experience

Moreover, worldwide tendencies suggest the growing popularity of AI-based SLA monitoring, predictive analytics, and systems of automated vendor assessment that contribute to improving the reliability of services and minimize the risks of its operations.

Overview of Indian Market

India has one of the highest rates of EdTech market in the world, due to the high number of students, high rate of digital adoption, and the government support. Indian EdTech market is projected to grow to USD 33.2 Billion by 2033; it is currently estimated at about USD 2.8 Billion, with a CAGR of about 28-30.

Key growth drivers include:

Digital India, NEP 2020, DIKSHA, and SWAYAM are only some government initiatives in this area. • Growing usage of smartphones and the internet. Demand in preparations in skill-based and competitive exams. • Gravity towards hybrid and online post-pandemic education.

Online education has one of the greatest user bases in India which has millions of students using online learning platforms. Nevertheless, this has brought about high reliance on various vendors, such as:

- LMS and ERP providers
- Cloud service providers
- Content creators
- Technical support vendors This poses such challenges as:
 - Poor uniformity of services.
 - Delays in content delivery
 - High operational costs
 - Vendor contract lack of transparency.

Thus, in the Indian context, vendor management and optimization of SLA is important to:

- Make digital education affordable.
- Provide reliability in service.
- Enhance scalability of the platform.
- Enhance user satisfaction

The usage of AI and automation tools in monitoring of vendors is also going up in India and it assists the institutions in enhancing SLA compliance and minimize disruption of services.

Overview of Gujarat Market

Gujarat is a forward-looking and fast emerging digital education ecosystem in India. The level of development of the digital infrastructure and use of educational technologies has improved greatly in the state.

Key highlights:

- 98% of schools are provided with computers.
- There is a percentage of 94 percent connected to the internet in schools. It has more than 1.14 crore students and 3.9 lakh teachers.
- Firm establishment of digital education programs in the midst and post-COVID-19.

Digital learning has been undertaken through a multi-modal process in- featuring of:

- Online platforms
- Television-based education

Mobile based learning solutions. Since this extensive use of digital has been organized at an early stage, the education system in Gujarat heavily relies on outsourcing vendors in:

- Electronic systems (LMS, ERP systems).

Network and connectivity services

- Development and delivery of content.

Technical maintenance and support.

This great dependence renders the performance of vendors and compliance of SLA to be imperative in providing continuous learning. Nevertheless, there are still problems:

- Rural-urban digital divide
- Internet quality disparity.
- Little standardization of vendors.
- Should have improved monitoring systems.

Therefore, to ensure that structured frameworks of vendor management and optimized SLA mechanisms are put into practice in Gujarat, it is necessary that:

- Make certain the delivery of services at consistent rates among the regions.

In rural communities, accessibility is driven down.

- Ensure platform reliability.
- Improve educational performances.

III. GROWTH OF THE INDUSTRY / SECTOR (EDTECH & DIGITAL EDUCATION)

The education technology (EdTech) industry has experienced a swift and radical increase in its development in the last ten years due to technological progress, heightened internet access, and movement towards a system of digital education. The online education market is currently expanding in a big way

with a valuation projected to grow to nearly USD 200 billion by 2030 as compared with its current estimation of about USD 30 billion in 2021 and the value of the market is projected to rise at a good rate of yen per annum-compound annual growth rate (CAGR) of approximately 23. The EdTech sector also represents one of the most rapidly developing industries in India with the help of a high number of students, the growing use of smartphones, and massive government programs like Digital India and the National Education Policy (NEP) 2020. An approximation of USD 2.8 billion was considered the Indian EdTech market in 2024 with a projected growth of USD 33.2 billion by 2033 with a CAGR that is almost 2830. By the year 2030, the sector is likely to have more than 100 million paid users hence a high level of demand in the future. Many major segments are contributing to this increase, such as K-12 education, preparative of competitive exams, skills, professional certification and business training. Also, the adoption of new technologies including Artificial Intelligence (AI), Machine Learning (ML), cloud computing, and virtual learning platforms have made digital education platform more effective and scalable. The COVID-19 pandemic was an incredible catalyst that boosted the acceptance of online learning and made institutions spend heavily on digital infrastructure. This shift has heightened the use of third-party providers of services like Learning Management Systems (LMS), development of content, cloud services, and support services. Consequently, the development of the EdTech industry has also changed the complexity of the operations, which has made the issue of vendor management and SLA

IV. LITERATURE REVIEW

Vendor management and optimization of Service Level Agreement (SLA) have been popularly researched within the framework of IT services, cloud computing and more recently within the educational digital platform. The studies below give considerable insight on the contribution of vendor performance, SLA design and integration of technology to enhance the service delivery and efficiency of the operation.

1. E-Learning System SLA Frameworks.

Elementary (2015) paid attention to creating SLA models in e-learning systems based on clouds. The proposed study had structured SLA parameters such as

uptime, service availability, and response time. It further reiterated that SLA frameworks are clear in enhancing transparency between the service providers and the educational institutions to result in improved service quality and accountability.

2. SLA Life-Cycle and Security Considerations. Nicolazzo et al. (2024) have carried out a review of the management of SLA and specifically on Security SLA (SecSLA). The paper demonstrated the significance of the inclusion of security metrics in the SLA contracts to provide data protection and conformance. It also found the gaps in the continuous SLA monitoring and suggested lifecycle-based SLA management to dynamic digital platforms.

3. The SLA role in relationship of outsourced IT.

Goo et al. (2009) investigated how the characteristics of SLA influence the relationship in the IT outsourcing. The research outcomes have shown that SLAs and relational governance are complementary and play an important role in shaping trust and flexibility along with long relationship with vendors. This observation is very pertinent to the EdTech systems where cooperation among vendors is needed to deliver the services uniformly.

4. Issues that affect SLA Performance.

Swain et al. (2022) compared the operational factors that influence SLA compliance in IT service management. Some of the important variables identified by the study which significantly determined the SLA performance were response time, efficiency of issue resolution and ticket management systems. It found that the optimal working processes have a direct positive influence on SLA compliance.

5. Managing Vendors in Education.

Hassan (2015) explored the performance management of suppliers in institutions of higher learning. The analysis has brought out the role of Key Performance Indicators (KPIs), regular appraisal of vendors and systematic monitoring systems in enhancing efficiency of the vendors. It pointed out that learning institutions should implement formal vendor performance evaluation schemes.

6. Supplier Selection and Multi-Criteria Decision Models.

Taherdoost (2019) and Bayazit (2004) studied different techniques of supplier selection, especially

the multi-criteria decision-making (MCDM) methods, including Analytic Hierarchy Process (AHP). These studies came to the conclusion that selection of vendors should be done on several aspects such as cost, quality, delivery and technological capability whereby, the selection of the vendor would be more aligned towards the organizational goals.

7. AI and Automation Effect on Vendor Management. The latest works of Mangalampalli (2023), Avancha et al. (2023) revealed the increased importance of Artificial Intelligence and Machine Learning in the area of SLA monitoring and vendor management. The findings suggest that AI

V. RESEARCH GAP IDENTIFIED

Although much has been researched and documented on SLA frameworks, vendor management, and selection of suppliers in information technology and supply chain divisions, there has been scanty research on its combination use in the educational digital platforms. Furthermore, the literature has not tried to combine the influence of vendor management, SLA optimization and new technologies such as AI in enhancing service delivery and access in EdTech industry. The proposed research is intended to fill this gap by offering an extensive framework that is specific to digital education platforms.

VI. BACKGROUND OF THE STUDY

The blistering development of digital technologies has changed the traditional system of education greatly to a more active and more technology-based ecosystem. Learning Management Systems (LMS), virtual classes, cloud-based applications, and AI-driven learning are just some of the ways in which educational establishments are embracing the digital platform to improve access, flexibility, and quality of education. This change has given rise to Educational Technology (EdTech) platforms that are intensive on third-party vendors in the provision of an array of services such as content development, software solutions, cloud computing, and technical support. Vendor relationship management has become an important operational activity in educational institutions as it grows dependent on the outside vendors. Conventional vendor management methods

that were mostly manual and reactive are no longer capable of operating in the present digitalized world. Digital platform involves complexity, which involves technology-oriented and structured vendor management systems that tend to provide transparency, accountability, and efficiency. SLAs are an important aspect of establishing the relationship between educational institutions and vendors by stating expectations and responsibilities. The parameters specified in SLA are measurable and include; uptime of the systems, system response time, service quality, security of data and time it takes to resolve. Nonetheless, the problem of poor definition of SLAs, absence of constant monitoring, inconsistent performance of the vendors, and insufficient implementation of advanced technologies are some of the problems facing many institutions. The acceleration of the EdTech industry in the Indian context, which has been aided by the government and rising rates of digital adoption, has only contributed to the necessity of proper vendor management and optimization of SLA. Thus, this work aims at evaluating the current approaches to vendor management, finding out the performance gaps, and suggesting the strategies to streamline the SLAs to enhance the efficiency and reliability of the educational online platforms and their scalability.

VII. OBJECTIVES OF THE STUDY

The major purpose of the research is to assess and enhance the vendor management and SLA performance in educational online platforms. The particular research questions of the study are as follows:

In the process of examining the current practice of vendor management implemented by educational institutions and digital learning platforms, it is necessary to pay attention to the vendor selection, monitoring of their performance, and contract management. To investigate Service Level Agreements (SLAs) as a means of quality, reliability, and accountability of the services provided in a digital education system.

In order to define the key performance indicators (KPIs) that include system uptime, response time, service quality, cost efficiency, and user satisfaction to measure the performance of the vendor.

To assess the difficulties and constraints related to managing vendors and implementation of the SLA including related problems connected with the lack of transparency, data protection, and inefficient work.

To evaluate how new innovative technologies like Artificial Intelligence (AI) and automation can enhance the monitoring of SLA and performance of the vendor.

To recommend an organized vendor management model that incorporates the cost, quality, and performance measures to enhance improved decision-making.

To propose the planning of the optimization of the SLA to increase the efficiency of the operations, minimize the number of service disruptions, and provide environmental sustainability of the expansion of educational digital platforms

VIII. PROPOSITION OF THE STUDY

Proposition 1: Vendor Management and Operational Efficiency

Effective vendor management practices positively influence the operational efficiency of educational digital platforms by ensuring better coordination, cost optimization, and consistent service delivery.

Proposition 2: SLA Effectiveness and User Satisfaction

Well-defined and effectively implemented Service Level Agreements (SLAs) enhance overall user satisfaction by improving system reliability, response time, and service quality.

Proposition 3: Vendor Responsiveness and Issue Resolution

Higher levels of vendor responsiveness led to faster issue resolution and improved service delivery outcomes in educational digital platforms.

Proposition 4: Platform Reliability and Performance Satisfaction

Increased platform reliability contributes significantly to higher levels of user satisfaction and perceived performance of digital education systems.

Proposition 5: SLA Optimization and Service Quality
Optimization of SLA parameters, including uptime, response time, and security, leads to improved service quality and better vendor performance.

Proposition 6: AI and Automation in SLA Monitoring
The integration of Artificial Intelligence and automation in SLA monitoring enhances real-time performance tracking, reduces service disruptions, and improves overall operational efficiency.

Proposition 7: Vendor Communication and Relationship Management
Strong vendor communication and effective relationship management improve coordination, reduce service failures, and contribute to successful service delivery.

IX. RESEARCH METHODOLOGY

Research Design

The research design is a descriptive and exploratory study that will examine how vendor management and SLA optimization can be used in learning digital platforms. The former has a descriptive approach that is employed to learn the existing practices and the former is the exploratory approach that aids in the identification of challenges and areas of improvement. The study is organized in the form of a survey design based on the use of Google Forms that allows gathering and analyzing the answers to various stakeholders in a systematic manner.

Sources of Data

The research is premised on primary and secondary sources of data:

- **Primary Data:** It is data that is gathered directly through the respondents, who are in this case the students, educators, platform administrators and vendors, using structured questionnaires.
- **Secondary Data:** Obtained in research articles, industry reports, government sources, and online materials in the area of EdTech, vendor management, and SLA structures.

The combination guarantees an all-inclusive and sound analysis of the research problem.

Data Collection Method

The data collection technique is mainly a survey method on the basis of an online questionnaire (Google Form). Structured questions were asked to the respondents pertaining to:

- Service quality
- Vendor performance

- SLA consciousness and performance.
- Platform reliability

Through online surveys, it was guaranteed that:

- Wide reach
- Cost efficiency
- Faster data collection
- Ease of analysis

Population

All the concerned stakeholders in the field of educational digital platforms will be the target population of this study including:

- Students / Learners
- Teachers / Educators
- Platform Administrators / Operations Managers.
- Vendors / Service Providers

The reason these groups have been chosen is because they are directly involved with or directly affected by vendor services and SLA performance.

Sampling Method

The researcher employs non-probability sampling method, which is convenience sampling. The selection of respondents was made due to their accessibility and availability over the internet.

Such an approach is appropriate because:

- Time constraints
- Ease of data collection
- Availability of interviewees in an online setting.

Sampling Frame

The sampling frame will be made up of those individuals who actively participate in digital education platforms. This includes:

- Online learning students studying in colleges and universities.
- Digital teaching faculty members.
- Technical employees operating electronic systems.
- Professionals related to EdTech services.

The frame is defined based on accessibility through academic networks, institutional contacts, and online communities

Sample Size

The proposed study will be carried out on a sample of around 180-190 respondents which will give an

adequate data to carry out relevant analysis and interpretation.

Data Collection Instrument

A structured questionnaire created with the help of Google Forms is the main tool of data collection. The questionnaire includes:

- Multiple-choice questions
- Likert scale questions (to test the level of satisfaction and agreement)
- Simple demographic questions.

The instrument was formed to elicit data regarding:

- Vendor performance
- SLA effectiveness
- Service quality
- User satisfaction

The use of Google Forms ensured:

- Standardization of responses
- Easy data compilation
- Efficient analysis using digital tools

X. DATA ANALYSIS AND INTERPRETATION

These results of the 222 respondents with a structured questionnaire give a significant understanding of the effectiveness of educational online platforms, especially under the authority of vendor management and the effectiveness of Service Level Agreement (SLA). The discussion shows that most of the users are still really using Learning Management Systems (LMS), virtual learning platforms, and ERP systems, which means that they are highly reliant on various third-party vendors to deliver content, infrastructure, and technical support. Such multi-vendor dependency makes the management of service quality and performance more complex. The feedback indicates that a majority of the users do not have technical problems frequently when using these platforms, with a lesser number of respondents stating they have frequent interruptions. This implies that although the platforms are mostly operational, there are visible holes of inconsistency and performance, which denote partial inefficiency in the execution of SLA. This is also supported by the level of user satisfaction, where the responses are spread in terms of satisfied and dissatisfied, with a large proportion of the respondent's showing dissatisfaction. This is an indication that the current vendor management practices are not quite

efficient in achieving a smooth user experience. System uptime is another issue which becomes a critical factor and most of the respondents rate the issue to be of high importance. This underscores the need to have good parameters of SLA that emphasize on availability and reliability. Despite the fact that most users view the platforms as relatively reliable, the fact that they experience inconsistency is evidence that SLA is not implemented consistently on all services. Regarding the issue solving, the majority of respondents stated that their issues are considered in a decent time period, i.e. it may be a day or several hours. There are however delays in some of the cases that indicate inefficiencies in the vendor responsiveness and support systems. The communication with vendors is usually viewed as very simple and efficient, implying that the mechanisms of coordination are established, yet it does not necessarily mean that the quality of services is always the same. One of the key issues that are detected in the course of the analysis is connected with data security. Many respondents also complained about the level of security of digital platforms and it can be said that the existing SLA models might not be helpful in meeting the needs of data protection and privacy. This brings out an important gap in the practices of vendor management. On the whole, the analysis proves that the responsiveness and communication of the vendors are rather high, but there are considerable issues related to the maintenance of the quality of the services, the security, and the efficiency of the operations. Such conclusions indicate that more formal vendor management tools and streamlined SLA models are required.

XI. RESULTS AND FINDINGS

The results of the research show conclusively that the vendor management activities in digital platforms in learning institutions are moderately performance but not optimally maximized. Vendors are highly responsive, and have a good communication channel, but, service delivery has inconsistency, which affects the overall performance of the platform. Application of SLAs seems to be incomplete with the most important parameters covered including uptime and response time which is not fully covered with critical parameters like data security and consistency of the service being taken care of. The research also indicates

that user satisfaction levels are not equally high where a large percentage of the respondents are not satisfied. This shows that the existing systems are not quite in line with the expectations of the users. The first critical area that comes out is data security, which indicates that the current SLA contracts do not have a detailed security coverage. What is more, the results demonstrate that, in spite of the overall usefulness of issue resolution mechanisms, they are not efficient enough to avoid delays in every situation. The inability to guarantee real time performance monitoring and fast response is due to the dependency on manual or semi-automated systems. On the whole, the findings indicate a significant need to enhance the vendor management approach, SLA, and technologies, including AI and automation, to make them more efficient, reliable, and user-friendly.

XII. LIMITATIONS OF THE STUDY

The current study is limited to some extent, which can impact the rates of the scope and generalizability of the presented results. To begin with, the research is mainly based on surveys of the respondents which could contain subjective perceptions and biases of the respondents. The sample used is very sufficient, but it is restricted to a certain group of users and might not be representative of the total population of users on the digital platforms. Also, the analysis is mostly pegged on the perception of the users as opposed to the facts on performance or internal vendors benchmarking, and this limits the possibility of making a more technical and accurate analysis on the effectiveness of the SLA. Restricted access to company-specific information, which includes detailed SLA agreements and vendor contracts, further restricts the level of analysis. The fast-paced nature of EdTech industry is a constraint as well, the changes in technology and the market can affect the applicability of the findings in the long term. Furthermore, the regional factors, including the differences in digital infrastructure and accessibility could affect user experiences and prevent the extrapolation of the findings to other regions.

XII. CONCLUSION

The paper finds that the key factors influencing the efficiency and effectiveness of educational digital platforms are vendor management and optimization of

SLA. Although vendors are mostly responsive and have good communication skills, there are serious loopholes in the provision of consistency in the service delivery, strong data protection, and user satisfaction, in general. The existing SLA models are not completely effective since they focus on simple performance parameters, yet they do not take into consideration the most important factors like security, reliability, and real-time performance monitoring. These holes restrict the capacity of digital platforms to provide user experience that is high in quality and seamless. The results indicate that in the absence of the methodical and technology-oriented process of managing the vendors, the educational institutions are likely to struggle with the ability to ensure the efficiency of their operations and attain the sustainable growth in the digital education setting.

XIV. SUGGESTIONS / RECOMMENDATIONS

To enhance the vendor management practices and further increase the effectiveness of SLA, the following recommendations are offered: Schools and colleges must come up with and establish elaborate SLA frameworks that articulate performance criteria that touch on uptime, response time, service quality, and data security. Such agreements must contain some quantifiable indicators to make them accountable. Advanced technologies like Artificial Intelligence and automation on real-time SLA monitoring are to be adopted. Such technologies are capable of assisting in anticipating possible failures, decreasing downtimes, and enhancing responsiveness. The institutions ought to have vendor performance evaluation mechanisms, such as dashboards and key performance indicators (KPIs) that would constantly monitor and evaluate the performance of vendors. This will help in increasing transparency and aid in making better decisions. Enhanced data security measures ought to be among the priorities. More powerful SLA provisions concerning data protection, privacy and regulatory compliance should be included to assuage the concern of the user. Moreover, the organizations need to consider commercializing the selection and vendor management procedures in order to achieve consistency and sustainability. It should have regular audits and performance reviews to ensure that there is quality in the services. Lastly, improving user satisfaction and platform reliability can be greatly

enhanced by improving issue resolving systems by responding faster and 24/7 support.

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