# Development of Effective ESG systems in Higher Educations

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**Abstract.** Given the great significance of institutions in the journey towards sustainability, most of them lack the ability to measure and improve their ESG activities. Based on this argument, this work presents the development of a web-based application called ESGConnect, intended to assist institutions in the evaluation process pertaining to their sustainability practices through an interactive structured submission and feedback mechanism. In ESGConnect, institutions provide ESG-related documents, which administrators verify and score with recommendations on how to enhance the documents based on the Environmental, Social, and Governance criteria. User-specific dashboards are present on the tool: administrators monitor submissions, whereas users see scores and comments associated with the submissions. In addition to these items, ESGConnect also supports collaboration because students and various stakeholders are allowed to have a dedicated online community for discussion and sharing information on sustainability practices. The architecture of the platform relies on Java Servlets, JSP, and database integration for easy handling of user management and data. Preliminary testing does indeed suggest that ESGConnect might be able to facilitate better communications and actionable insights for institutions interested in improving their sustainability efforts. Expansion of the platform features and improvement in scalability to service a much larger number of educational institutions are part of the future work.

**Keywords.** Environmental, Social, Governance (ESG), Sustainability Assessment, Feedback Mechanisms.

## 1 INTRODUCTION

Sustainability has become the concern of international importance for the institutions today and is essential for mitigation of environmental degradation, enhancement of social well-being, and strengthening of governance. The ESG framework is an overall structure that helps evaluate and manage such sustainability efforts. Educational institutions play a key role as influencers of the future, making it not only unique in their internal sustainable practices but also shaping a broader influential society. Even though ESG aspects are increasingly taking on importance in the educational area, there still exist massive challenges related to self-evaluation of sustainability practices among educational institutions because of the lack of standardized tools and fragmented feedback mechanisms as well as inadequate collaboration among the stakeholders.

Probably, the most identified key challenge is that there exists no unified platform at the institutional level through which it can document, assess and improve its ESG-related activities. The ESG evaluations carried out at the moment in various educational institutions are sporadic; no structured methodologies are put in place through which such institutions receive feedback or guidance on their sustainability performances. There is limited opportunity for the institutions to hold meaningful dialogues with external stakeholders or learn from their peer-level institutions. This, in turn, leads to many institutions not making fact-and-statistics-driven decisions that improve their ESG outcomes.

This paper proposes ESGConnect, a web application that grapple over the aforementioned issues by providing a central mechanism for submitting ESG-related papers submitted on a potential institution for administrative review, obtaining detailed feedback from the administrators about the respective institutional performance and rating on the ESG performance. The ESGConnect there enables a ceaseless review loop wherein the institutions are provided actionable insights so that their sustainability efforts can be improved. Besides, it encourages collaboration by offering two kinds of communities: a student community where peers can discuss sustainability and stakeholder community with industry experts, administrators, as well as faculty to share knowledge and make decisions on ESG issues.

Development and Features ESGConnect will be discussed in this paper, with its potential effects on sustainability practices in higher education evaluated and future enhancements explored.

# 2 LITERATURE SURVEY

ESG reporting has become quite popular among corporate, government, and educational organizations. Several studies have been conducted to understand how measurements of ESG are impacting the sustainability drive. For instance, Smith and Taylor [1] were of the view that adoption of ESG frameworks in corporate governance needs more emphasis on standardization and reporting level transparency to improve sustainable practices. Johnson [2] also indicated the growing role of ESG compliance in education, particularly in developing social responsibility and environmental stewardship in students and staff members. However, most of these efforts are fragmented, and there is very few interaction and feedback between institutions, thereby minimizing the effectiveness of sustainability initiatives in institutions.

A number of tools and websites have emerged to facilitate sustainability assessment in higher institutions of learning. For example, STARS is one of the most utilized frameworks due to the fact that it has availed a platform whereby colleges and universities can clearly depict their sustainability performance using self-reporting [3]. Even though White et al. [3] reported that effectiveness in quantifying sustainability efforts in the framework was noted, they pointed out that its focus on self- reporting does not offer complete mechanisms of providing feedback or peer-to-peer engagement. Other platforms, like GreenMetric [4], offer rankings in line with sustainability indicators, but these also do not have a process by which institutions receive specific feedback or the possibility for meaningful dialogue with third-party stakeholders.

Currently, advances in web-based technologies also make it possible for institutions to automate and streamline the processes associated with ESG reporting and feedback. Lee and Kumar [5] discussed how platforms such as the Carbon Disclosure Research provide an excellent basis for an organization to document and enhance its efforts for sustainability through standardized metrics. On the other hand, a performance review of GRESB providing solutions in sustainability reporting was reviewed by Park et al. [6]. Most of these platforms, however, cater to corporate or governmental organizations, and very few are developed specifically with the needs of higher education institutions in mind. Besides, the point is that such a system usually concentrates on quantitative reporting and does not provide value for the institutional importance of building a social community where institutions can have best practices and collaborate toward ESG improvements.

An integrated ESG management system in higher education is needed to serve as a medium encouraging both reporting and feedback but still creating an environment of collaboration. Chaudhary and Patel [7] have specified the limitations of the existing tools that are while useful are not providing comprehensive solutions to the problems arising from the implementation of ESG practices in education institutions. The gap in literature and technology inspired the creation of ESGConnect, an online platform allowing institutions to submit their ESG-related documents and track actionable feedback, ratings, and engagement within a community of stakeholders and others interested in the discussion. ESGConnect thus fills this vacuum by offering a holistic solution especially tailored to the needs of higher education, with the aim of decisively improving decision-making capabilities for the guarantee of sustained improvement in sustainability.

| Authors | Title | Key Findings | Limitations |
|---------|-------|--------------|-------------|
| Smith and Taylor | Adoption of ESG frameworks in corporate governance | Emphasizes the need for standardization and transparency in ESG reporting to improve sustainable practices | Fragmented efforts, lack of interaction and feedback between institutions |

| | | | |
|---|---|---|---|
| Johnson | Growing role of ESG compliance in education | Highlights the importance of ESG in developing social responsibility and environmental stewardship | Fragmented efforts, minimal interaction and feedback between institutions |
| White et al. | Effectiveness of STARS framework in quantifying sustainability efforts | STARS provides a platform for self-reporting sustainability performance | Focus on self-reporting, lacks mechanisms for feedback or peer-to-peer engagement |
| Lee and Kumar | Role of Carbon Disclosure Research in documenting sustainability efforts | Provides standardized metrics for documenting and enhancing sustainability efforts | Primarily caters to corporate or governmental organizations, not tailored for higher education needs |
| Park et al. | Performance review of GRESB in sustainability reporting | Reviews solutions in sustainability reporting provided by GRESB | Focuses on corporate or governmental organizations, lacks emphasis on higher education institutions |
| Chaudhary and Patel | Limitations of existing ESG tools in education institutions | Identifies gaps in existing tools and proposes the need for an integrated ESG management system | Existing tools do not provide comprehensive solutions for ESG practices in education institutions |

## 2.1 Summary:

This literature survey indicates a growing role of ESG reporting for corporate, governmental, and educational sectors. The research study found that although compliance with ESG and the frameworks led to better sustainability, institutional collaboration and feedback mechanisms still acted as a strength to them. To be mentioned are sustainability assessment tools for higher education, such as STARS and GreenMetric, which are self-reporting tools that lack detail or mechanisms for peer engagement or feedback. Others exist, such as the Carbon Disclosure Research and GRESB, suited more for corporate- based reporting but do not directly affect the educational institutions, especially their importance in the value and formation of collaborative social communities.

The gap in the existing ESG management systems was what inspired the establishment of ESGConnect as it sought to cover this gap within a web-based platform for connecting institutions. Institutions are encouraged towards both ESG reporting and providing feedback; thus, they generate a high level of collaboration. ESGConnect is a holistic solution for higher education that creates better decision- making opportunities and fosters continuous improvement in sustainability based on actionable community feedback.

# 3 METHODOLOGY:

The development of ESGConnect was done in a structured manner to ensure that this web-based platform for Environmental, Social, and Governance reporting and feedback within higher education will exactly meet the needs of educational institutions. The methodology comprises several steps, which are as follows:

## 3.1 Requirements Gathering and Analysis

The research began with a research study about the key needs of educational institutions regarding ESG reporting and feedback mechanisms. This included:

1. *Stakeholder Analysis*

Reaching out to the universities, administrators, and sustainability experts on their needs concerning ESG reporting, feedback, and further collaboration.

2. *Literature Review*

There is an examination of the existing tools, which are used to identify gaps and shortcomings in current sustainability assessment platforms for higher learning institutions.

3. *Functional Requirements*

Documentation of important functionalities related to document submission, ESG ratings provision, feedback provision, and social/stakeholder community engagement.

4. *Non-functional Requirements*

Performance, security requirements, and usability factors for the platform.

## 3.2 System Design

Based on the gathered requirements, a modular system architecture has been designed to support several platform components:

1. *User Role and Authentication*

Construction of role-based access control for all users, including administrators as well as representatives of educational institutions. Administration ratings and giving comments on document submission, and users (colleges) submit ESG-related documents and view ratings.

2. *Database Design*

Designing the structure of a database to store information such as college name, uploaded document, ESG ratings and feedback, with user roles and timestamps for the uploaded data in question.
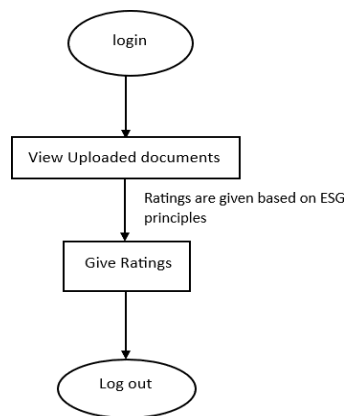
3. User Interface Design

A user-friendly interface design for the users and administrators. The user interface helps to upload the document, and the administrator interface helps to view the feedback and rating module.

4. *User flow diagram*
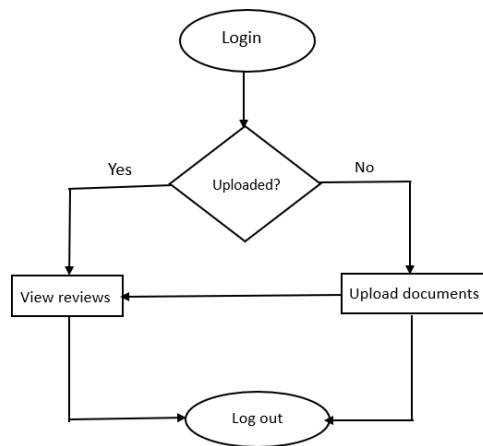


5. *Admin flow diagram*



# 3.3 Platform Development

The system was developed in an iterative manner, using the following components:

1. *Frontend Development*

This would build web pages using HTML, CSS, and JavaScript that provide an interactive, responsive interface. The key pages include upload.jsp for document uploads, admindashboard.jsp for the administrator to manage feedback, and collegeDashboard.jsp that enables users to view ESG ratings.

2. *Backend Development*

Implementing the server-side logic using Java Servlets and JSPs. This layer maintains business logic related to document submission, ESG rating calculation, and role-based redirection to appropriate dashboards.

3. *Database Integration*

Connect to the database, say MySQL, to store uploaded documents, ESG ratings, and feedback. Optimized queries have been devised to fetch data based on college names rather than unique IDs as the user wishes.

## 3.4 Testing and Validations

I used a comprehensive test on the server for proper working:

1. *Unit Testing*

Module functions like uploading documents and submitting feedback were tested in their individual modules.

2. *Integration Testing*

End-to-end testing of the entire system, ensuring the perfect interaction between frontend, backend, and database constituents.

3. *User Acceptance Testing*

Different stakeholders gave their views on whether the delivered system meets their needed functionality and usability expectations.

## 3.5 Deployment and Feedback

Once it had undergone successful testing, the platform was rolled live:

1. *Hosting by a Web Server*

Deployment on the platform is hosted on a web server with access protection for administrators and educational institutions.

2. *Continuous Monitoring*

Installing monitoring tools for tracking system performance, document submission rates, and activity among users.

3. *Feedback Loop*

Continuous feedback from users as well as stakeholders to add new features and resolve bugs.

## 3.6 Continuous Improvement

After deployment, the system enters a continuous improvement cycle:

1. *User Feedback Integration*

Update the platform based on user feedback, such as improvement of the UI or betterment of the features in social communities.

2. *Feature Addition*

More features like automated computation of the ESG score, peer-to-peer interaction, and advanced reporting functionalities.

3. *Scalability*

The system must scale to accommodate numerous growing institutions and stakeholders without losing performance.

This approach was used in developing and deploying ESGConnect, which addresses the unique needs of higher education institutions for ESG reporting while promoting collaboration through actionable feedback and a social community for improvement in sustainability.

# 4 RESULT
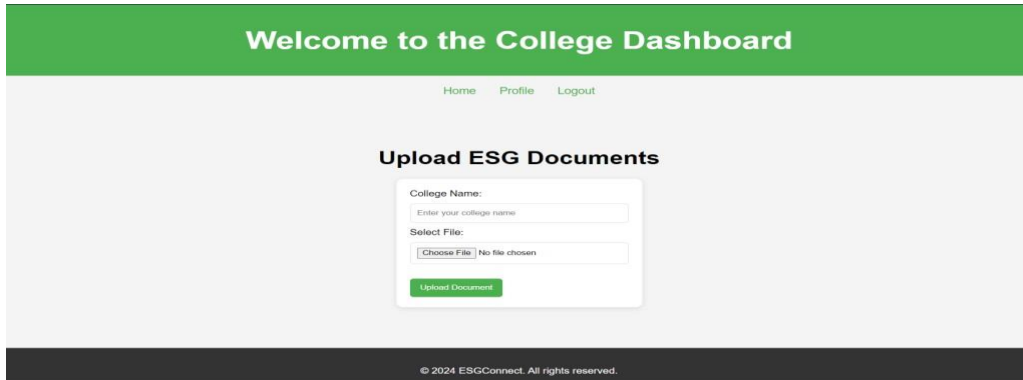


The main section of the page is dedicated to uploading Environmental, Social, and Governance (ESG) documents. It includes:

1. *College Name Input Field*

A text box labelled "College Name," prompting users to enter the name of their college.

2. *File Selection Button*

A section for selecting the file to upload, with a button labelled "Choose File." Currently, it indicates "No file chosen," suggesting that the user has not yet selected a file.

3. *Upload Document Button*

A button labelled "Upload Document," which users would click to submit their selected file along with the college name in which the college name and uploaded files will be stored in the database.
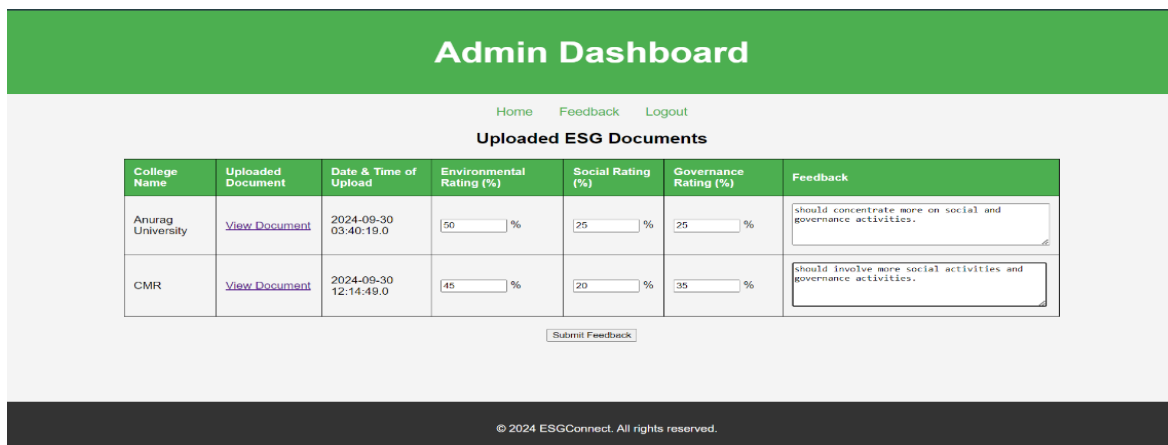
The main section of the dashboard contains a table that lists the details of the uploaded ESG documents. The columns in the table include:

1. *College Name*

Displays the names of the colleges that have submitted documents.

2. *Uploaded Document*

Each entry has a "View Document" link, allowing the admin to access the respective document submitted by the college.

3. *Date & Time of Upload*

Shows the timestamp for when each document was uploaded

4. *Environmental Rating (%)*

Displays the percentage score assigned to the college's environmental practices.

5. *Social Rating (%)*

Represents the percentage score related to the college's social initiatives.

6. *Governance Rating (%)*

Indicates the percentage score pertaining to governance practices within the institution.

7. *Feedback*

A text area where the admin can provide specific feedback regarding the submitted documents and the associated ratings.

Feedback Submission: At the bottom of the table, there is a "Submit Feedback" button, enabling the admin to finalize and send any feedback provided in the respective text areas.

**College Details**

| College Name | Uploaded Document | E Rating | S Rating | G Rating | Feedback |
|---|---|---|---|---|---|
| Anurag University | View Document | 50 | 25 | 25 | should concentrate more on social and governance activities. |
| CMR | View Document | 45 | 20 | 35 | should involve more social activities and governance activities. |

The College Details of the ESG Connect platform gives detailed college information regarding the performance of the colleges concerning ESG. A table is also provided showing the name of each college; a link is attached to view all the documents uploaded by each of the colleges.

Percentages of ratings for Environmental (E Rating), Social (S Rating), and Governance (G Rating) are given to make immediate comparisons possible. In addition, it provides feedback for each college, pointing out areas of weaknesses, such as the fact that Anurag University needs more social and governance activities, and

CMR is recommended to increase its social efforts. This format facilitates assessing and strengthening sustainability practices across campuses.

## Details for Anurag University

| Uploaded Document | Rating (Environmental) | Rating (Social) | Rating (Governance) | Feedback |
|---|---|---|---|---|
| View Document | 50 | 25 | 25 | should concentrate more on social and governance activities. |

The Details for Anurag University breaks down the details related to the particular ESG of the institution. It is shown that Anurag University has uploaded an ESG document, and it can be accessed through this link "View Document.".

The ratings are given based on the documents. In addition, the reviews are given which suggests any changes or improvements that the university is needed to work more toward developing its ESG activities. With such detailed analysis, there comes a focused analysis of the university's sustainability practices. It shows the same for all the colleges which have uploaded the documents.

# 5 FUTURE ENHANCEMENT OF ESGCONNECT PLATFORM

The ESGConnect platform can be improved in several ways to make it more effective and user-friendly:

1. *Improved Feedback System*

Future updates can include providing more customized feedback options, such as specific action plans and reminders, to enable better monitoring and tracking on the part of institutions. Automated suggestions by AI could also be helpful in targeting areas for improvement.

2. *International ESG Standards Alignment*

Institutions could align their efforts easily with global sustainability practices by interlinking the platform with recognized international ESG standards such as GRI or SASB; this would make their comparisons meaningful.

3. *Improved Data Visualization*

The presentation of ESG performance through the addition of charts, graphs, and dashboards will make the data very understandable for the users. Moreover, it is possible to export detailed reports into PDF or Excel format for sharing with the stakeholders.

4. *Cooperation and Community Involvement*

There could be a forum for the exchange of ideas and best practices among institutions, with a ranking system to encourage healthy competition and improvement in ESG performance.

5. *Automated Data Tracking*

Automated data submission and tracking through tools such as sensors or real-time data collection could reduce manual work and ensure data is available when needed.

### 6. *Mobile App Development*

Developing an ESGConnect mobile application would enable users to access the platform easily, upload necessary documents, and receive valuable feedback on the go, thus improving accessibility and engagement.

These enhancements would make ESGConnect more efficient, scalable, and useful for educational institutions.

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