STUDENT FEEDBACK SYSTEM USING MACHINE LEARNING

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Abstract.

The research was conducted in order to present the student feedback system analysis model for improving the quality of teaching in academic institutions and universities. The system primarily utilizes a machine learning algorithm and textual feedback. This system has-been configured to analyse student feedback in the form of comments, opinions, and reviews about teachers' performance. The textual feedback offers valuable insights into overall teaching quality and suggests valuable ways to improve teaching methodology's, Random Forest, Naive Bayes algorithm, and lexical analysis are examples of machine learning techniques. SVM has the highest accuracy but requires more time to train for large datasets and is used for regression and classification to classify

Keywords. Introduction, Objective Literature Survey, Proposed Methodology, Software Requirement, , Implementation, Results And Discussion, Conclusion, Future Work, References

1. INTRODUCTION

This study postulates a system for student feedback that aids in assessing the effectiveness of the teacher. This student feedback system collects textual comments from students and utilizes the SVM algorithm to categorize them. Once a student logs into the portal and submits feedback, the feedback is evaluated through the analyser. Using the support vector machine technique, feedback was then categorized into three polarities: positive, negative, and neutral. This polarity makes it easier to determine whether a performance is good, awful, or middling so that teachers can tweak their approach. The method employs subject extraction and classification to graphically represent and rate the students' opinions. This system's objective is to assist teachers in adapting their teaching strategies in light of feedback they have received. The methodology uses concept extraction and classification to graphically represent and rate the students' opinions. This system's objective is to assist teachers in adapting their teaching strategies in light of feedback they have received. The system is designed to give the college president and department head input easily and quickly (HOD). Only the feedback that would be offered in the form of ratings is visible to the teacher. The department head has the authority to view all comments being made for each instructor, lab activity, and extracurricular on the departmental level. The ability of the department head to handle extracurricular and laboratory activities in a different or better way will help to improve departmental performance as a whole. Also, the department head has the authority to hire and fire employees. Ultimately, this system will assist in enhancing the effectiveness of the college's departments and teaching techniques by gathering student input.

2. LITERATURE SURVEY

Ref no	Authors / Year	Name of the paper	Methodology
1	Supriya Kharche, Swapnil Bhosale., (2017)	"A Smart Student Feedback System Using Opinion Mining"	This paper proposes an automated system for analysing student feedback using opinion mining techniques. The system utilizes Natural Language Processing (NLP) to process and categorize student comments into positive, negative, or neutral sentiments. The authors implemented a Naive Bayes classifier to predict the sentiment of the feedback, and the system was tested on a dataset of student comments
2	Ankita Jain, A. P. Kapse (2019)	"An Intelligent Feedback Analysis System Using Machine Learning	This research paper introduces a machine learning-based approach for analysing student feedback. The authors developed a feedback analysis system that employs Support Vector Machines (SVM)
3	Vandana G., V. Balakrishna (2018)	"Automated Student Feedback Analysis Using Text Mining and Sentiment Analysis"	This paper presents an automated approach to student feedback analysis using text mining and sentiment analysis. The authors employed a hybrid methodology combining rule-based and machine learning techniques to extract relevant features from textual feedback
4	R. Nithya, R. R. Rajashree (2020)	"A Framework for RealTime Student Feedback Analysis Using Deep Learning	This paper outlines a framework for real-time analysis of student feedback using deep learning techniques. The authors implemented a Convolutional Neural Network (CNN) model to classify student comments based on sentiment and relevance\
5	Pooja R., S. V. Kamat	A Comparative Study of Machine Learning Techniques for Student Feedback Analysis"	This paper compares various machine learning techniques for analyzing student feedback, including Logistic Regression, SVM, and K-Nearest Neighbors (KNN

3. EXISTING METHODOLOGY

In the current system, it is challenging, time-consuming, and requires paperwork for students to provide feedback using the manual system. To solve this issue, Google Form feedback is now provided to students in place of educational institutions, and they are expected to do so via the provided URL and a Google Form. The process is made simple and time and paper work are saved by collecting the responses using a google form. The replies gathered from the students are saved in Google Forms as a.csv file.

4. PROPOSED METHODOLOGY

A website would be used to collect student feedback in the proposed system, and ML algorithms would be used to evaluate questions created using the academic resources made available to students. The input is then divided into three categories: satisfactory, neutral, and negative. The goal of this system is to gather student feedback and use machine learning methods to analyse it. To achieve the goal of student feedback, we need methodologies like machine learning- based approaches in addition to other approaches like data analysis and model construction.

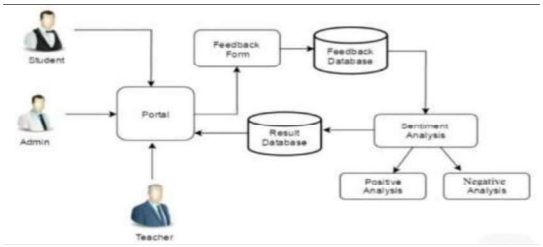

Figure 4.1 System Architecture

Benefits of the proposed system include: Significantly lowers time and effort. Reduces paperwork Attractive user interface Improves security Report generation is simplified and efficient.

5. METHODOLOGY & RESULTS

5.1 The website feedback from students is an input source of information. I.e., training data that will be used to train the system. When test samples are received, the trained system. When a test sample is received, the trained system uses machine learning algorithms to categorize the text into positive, neutral, and negative categories. This outcome is represented graphically. The suggested methodology consists of six steps: gathering student comments, preparing training data, feature extraction, training the model, analysing test outcomes, and graphical representation.

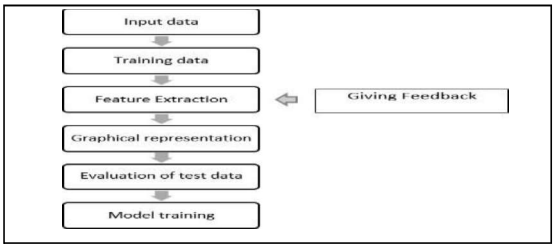

Figure 5.1 Methodology

5.2 FEATURE EXTRACTION

Machine learning algorithms are used in this feature extraction from datasets that include formats like text. The feature extraction process is applied to both train and test data. by use the sci kit-learn toolkit, which includes tools for tokenizing and stemming textual data. These text documents can be tokenized, and Count Vectorizer, Tf-idf

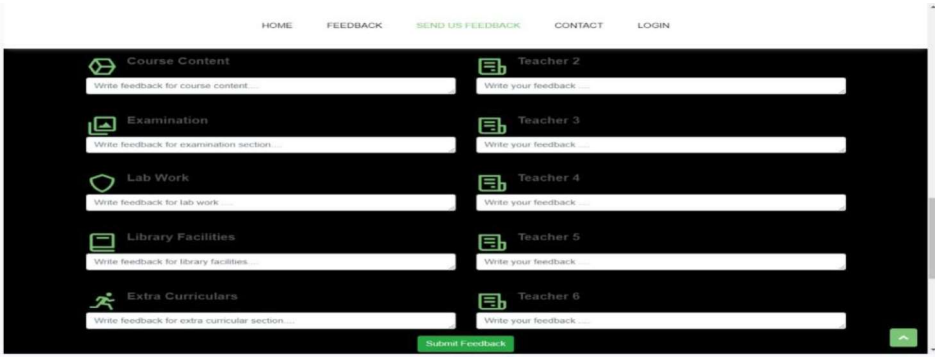

Figure 5.2 Feedback Form

Vectorizer, Snowball Stemmer, and SGD Classifier are used to build a vocabulary of recognized terms. These feature tools are employed in the extraction of data features.

There are several different machine learning text classification algorithms.

A) Multinomial Naive Bayes Classifier (MNBC)

This MNBC is a well-liked machine learning technique addressing issues with text classification in NLP (NLP) It is especially helpful for issues involving discrete text data features, like word frequency count.

B)Support vector machine (SVM) classifier algorithm. Support vector machine analyse data , specify decision boundaries , and use kernels for computations that take place input space. The two sets of vector input data are categorized into different classes. Finding a space between the two classes that is remote from the document is the current task. The classifier's margin is determined by the distance, and increasing the margin helps to cut down on incorrect judgments. SVM method also provides regression and classification. They improve in statistical learning and support in highlighting the aspects that contribute to better knowledge.

SVM takes the following actions:

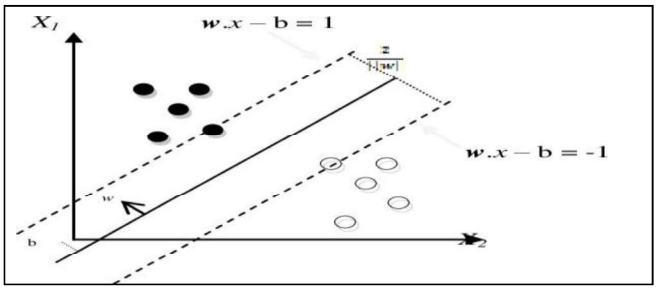

Figure 5.3 SVM Classifier

•Investigate the information to determine how they appear. Pre-process the information.

•Separate the data into labels and attributes. Create training and testing sets from the data.

•Practice with the SVM method.

•Create a few forecasts.

•Assess the algorithm's output.

The top dataset points of the hyperplane are classed as positive and the given score is 1 in the SVM model discussed above. lower dataset points are marked as "negative classifiers," and they will be given a score of "-1."

5.3 EVALUATION OF TEST DATA

Data collection and analysis are steps in the evaluation process, and the outcome can be used to judge whether the model is operating well or not. The training portion of this process has been finished. The challenging final step will yield the model's best accuracy. It will be used in testing. After determining the model's accuracy, we can select the most efficient algorithm and modify it for the model's training and testing.

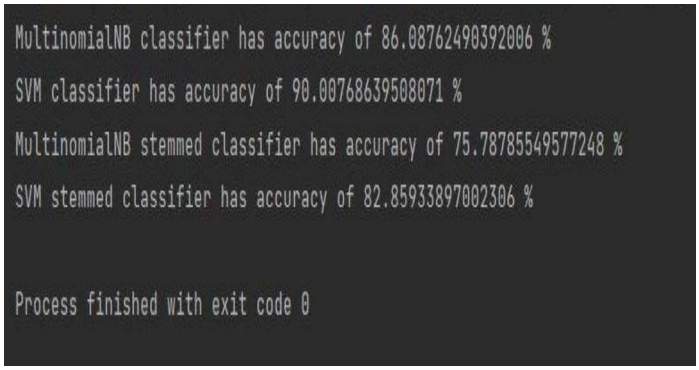

Figure 5.4 Accuracy

5.4 GRAPHICAL REPRESENTATION

Data visualization is the presentation of data in graphical format.HTML and CSS have many features that provides graphical interfaces. It is the representation of data using common graphics such as charts, plots, infographics, and even animations. These information visualizations communicate complex data relationships and data-driven insights in an understandable manner.

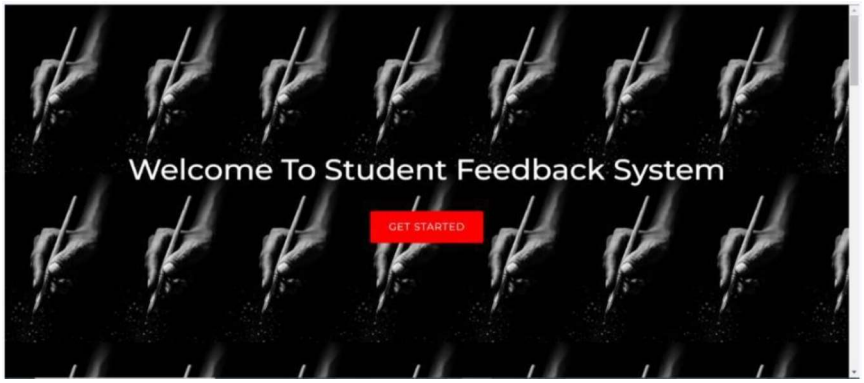

Figure 5.5 Home page

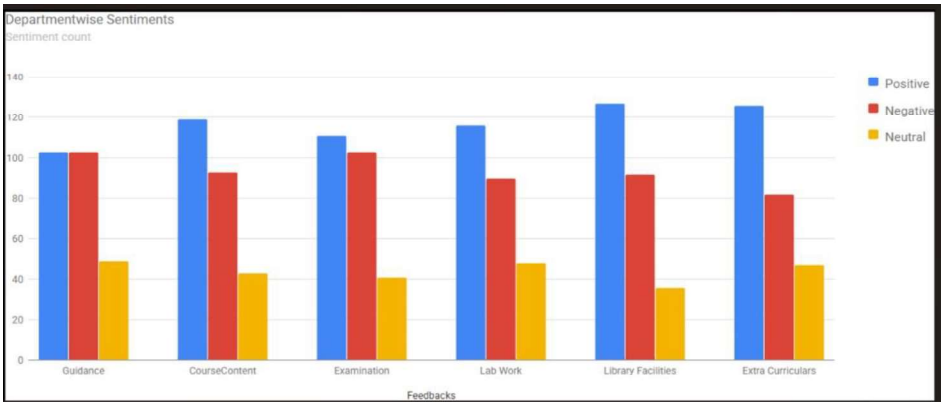

Figure 5.6 Bar Chart

	Timestamp	teachingscore	teaching	coursecontentscore	coursecontent	examinationscore	examination	labworkscore	labwork	libraryfacilitiesscore	libraryfacilities	extracurricularscore
0	2/9/2023 12:13:16	1.0	The instructor was interested in the students and their progress.	1.0	The instructor showed enthusiasm for the course component.	-1.0	He was not prepared to explain the course for examination.	0.0	The instructor was not prepared for the session but he explained it in a good manner.	-1.0	The library facilities are not good.	-1.0
1	2/9/2023 12:28:54	-1.0	The instructor don't use any examples for explaination.	-1.0	The course content provide by this teacher is not sufficient for exams	0.0	at the time of examination the provided content is not good but he explain it nicely	1.0	in practicle exam he helped us a lot	1.0	the enviroment of library contributed to my spiritual growth.	0.0
2	2/9/2023 12:38:03	0.0	Teaching is good but always late to class	1.0	Finish course on time	1.0	Patern is easy	1.0	Easy	0.0	All books are not available but hall is quite big	1.0
3	2/9/2023 12:40:16	0.0	Explaination is poor	0.0	Never finish course on time	1.0	Easy	1.0	Good	1.0	Good	0.0
4	2/9/2023 12:41:49	-1.0	The teaching is slow. They stretch the same thing for a long time. That the students lose interest.	0.0	The course content is good. But out dated.	0.0	Examination is okay. But can be good.	1.0	Good	1.0	Library is spacious	1.0
5	2/9/2023 12:42:30	-1.0	Very poor	1.0	Quite good course	-1.0	Poor	1.0	Excellent	1.0	Excellent	1.0
6	2/9/2023 12:44:14	0.0	Content delivery is not good	0.0	Some contents are bad	1.0	Excellent	0.0	Average	1.0	Excellent	1.0
7	2/9/2023 12:46:07	-1.0	Bad	-1.0	Not covered	-1.0	Very hard	1.0	Good	1.0	Everything is available	-1.0
			The instructor		The topics and		The amount of		The goals were			

Figure 5.7 Data Set

6. CONCLUSION

In summary, this project effectively creates an automated system for student feedback that makes use of natural language processing and machine learning to effectively evaluate and categorise input. Through an intuitive dashboard that offers realtime information, the system enables administrators and educators to make data-driven decisions that enhance the quality of instruction and course material. The system's automation and scalability provide reliable feedback analysis, which makes it an effective instrument for improving learning as a whole.

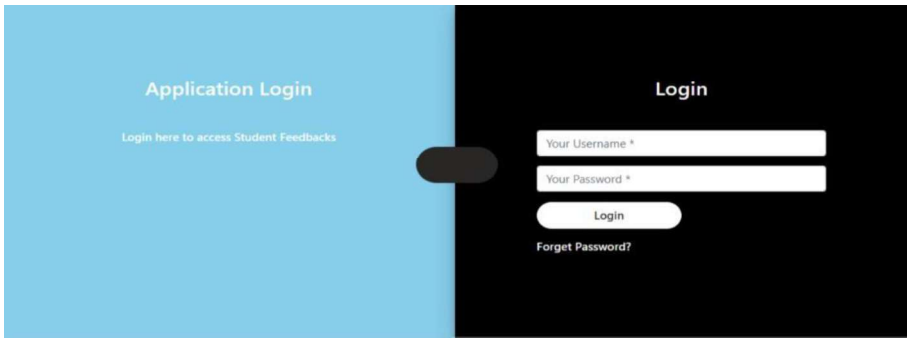

Figure 6.1 Login page

7. FUTURE SCOPE

The future scope of this project includes expanding the system to handle more complex feedback using advanced deep learning models for better accuracy. It can be integrated with additional data sources, such as social media or student performance metrics, to provide more comprehensive insights. Enhancing the system's real-time capabilities and incorporating features like predictive analysis can help institutions proactively address potential issues. Additionally, the system can be adapted for use across different educational levels and institutions, making it more versatile and scalable.

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