A Java-Based System for Collecting and Analyzing College Feedback

Sneha Kapoor
Assistant Professor, Dept. of CSE
Swami Vivekanand Subharti University
Meerut, India
jollysnehakapoor@outlook.com
https://orcid.org/0009-0000-2062-5997

ABSTRACT – *Educational institutions have recently recognized the value of student input in enhancing the teaching and learning process. A cutting-edge web tool called the Online Feedback System (OFS) has been developed specifically for schools and colleges to facilitate online student feedback. The OFS aims to offer a comprehensive feedback system that meets the needs of both teachers and students. Teachers and administrators can easily create, examine, and summarize teacher feedback using the OFS. Accessible to all college students and staff, the system allows students to rate their satisfaction with their professors. One of the key benefits of the OFS is its efficiency. Students can quickly and easily provide feedback on their lecturers and courses, saving time and allowing school administration to assess the results more swiftly. Additionally, the OFS evaluates feedback according to specific criteria. This customization ensures that the feedback obtained is relevant and useful to the school or college. The system also offers teachers the option to receive anonymous student feedback, encouraging open dialogue between educators and students. Another important feature of the OFS is its capability to provide effective feedback analysis for both students and staff. The system generates detailed reports and analytics, providing valuable insights into student satisfaction and areas for improvement. This data helps identify patterns and trends in student feedback, enabling schools and colleges to make data-driven decisions to enhance the teaching and learning experience.*

Keywords: *Feedback, Management, System, Project, Educational*

I. INTRODUCTION

In Learning became more prominent in today's digital world. This resulted in a sudden rush of interest toward college courses within academic institutions. However, the system of delivery of academic feedback online needs to be more reliable and adaptable than ever with the rising student enrolments. The Java-based Feedback Management System will address this need in an urgent consideration of institutional and educational practices and processes in FIR - the student complaints about the depth of knowledge they acquire [1]. Basically, it is hoped to establish a healthy relationship between students and their learning environment and students with their teachers through the Java-based Feedback Management System. This system is a crucial tool to ensure relevant feedback by students and fulfill their need with respect to learning. In pursuit of fulfilling these, we have developed what we call the 'Faculty Feedback System': an easy and uniform platform through which students can contribute their bit by providing feedback to the head of the respective department or principal of the college. This service provider, with the help of an online system, allows students to provide feedback regarding faculty members' teaching style and effectiveness, and availability. The Faculty Feedback System provides a platform that helps assure very critical improvement in the quality of education [2]. It bridges the gap between students and teachers, therefore helping in pinpointing problem areas that need revision, thus enabling the drawing up of concerns efficiently and effectively by educators. By providing an open and transparent culture, the Faculty Feedback System helps deliver the best possible education to students and simultaneously provides valuable insights for teachers in order to improve teaching methodologies. Another focal point of the Java-based Feedback Management System is its flexibility [3]. This will easily fit into any institution's infrastructure by utilizing the already available resources and technologies at the educator's side. Moreover, the system allows high customizability so that institutions can have it working according to their needs and requirements. The ability of a system to evolve and adapt to changes in institutional or student

requirements makes it flexible. The Java-based Feedback Management System is used to enhance efficiency since it automates most of the activities that go along with academic feedback. A student in this system will easily respond quickly without filling paper forms or engaging in face-to-face meetings. Besides, this system can be used to allow educators real-time access to feedback, enabling them to act on matters raised by the students promptly and effectively [4]. Another important benefit of the Java-based Feedback Management System is its capability of scaling up. It can scale up the growth of an institution, whether in terms of enrolments or additional departments/programs. Scalability of the system enables it to operate and maintain quality education as changes and institutional growth are accommodated. In summary, a JAVA-based Feedback Management System is vital and of greater importance to institutions that seek to achieve high standards in their education systems through the students consulting with teachers and pointing out overt improvements for attention and alerting the appropriate authorities on the issues necessary for its attention. It is efficient, scalable, and very adaptable to potential academic needs [5]. Through this Java-based Feedback Management System, academic institutions

II. LITERATURE REVIEW

A. Existing System

While the various existing college and university student feedback collection and analysis systems abound with varied features and functionality, several limitations do exist that impact their effectiveness. First, one limitation is the time-consuming nature of collecting feedback. Existing systems often require students to fill out online forms or user-interfaces, which is described as laborious and time-consuming [6]. This could result in low response rates and, probably, biased feedback from students in case they would not bother to write detailed feedback. Another limitation is that in most instances, very few options are available to customise the nature of the surveys or reports which can be generated. Indeed, this eventually makes it very difficult to get feedback on discrete parts of the teaching and learning experience specific to an institution [7]. Most of the existing systems also do not provide real-time feedback and analytics, hence barring the administrators from taking any effective and timely actions pertaining to the issues raised by the students. Though all these limitations exist, the systems of feedback collection and analysis from students in a college or a university are an integral part for improving the quality of education [8]. They provide ways in which students can give their opinions and raise concerns, and thus administrators can use them to bring about improvements. Inevitably, with increased advancement in technology, the feedback systems will turn out to be more sophisticated and user-friendly. This could involve the embedding of artificial intelligence and machine learning algorithms that analyze information from feedback data and provide real-time insights for administrators [9]. By and large, the feedback collection and analysis systems available at colleges and universities have all the potential to become a very instrumental tool for improving the quality of education. The room for improvement as to better customization options, response rates, and real-time feedback and analytics is always there [10].

B. Proposed System We are currently working on a software application that would give students from the college and university level a platform to mention daily feedbackes associated with their lectures and courses [11]. The information gathered from the application will be stored on the Firebase server, which is analysed further to result in some valued insights and suggestions, which will really work towards the betterment of students. An app landing page will be made to include a card view with four options as follows: Login as a Student, Login as an Admin, a chat room for proposed future features, and an option to provide feedback. Once the student logs in, another new page opens where students can add their feedback day by day; this gets saved in the app and is accessible to all using it [12]. This will further facilitate the heads of the institution in locating strengths and

weaknesses that are prevalent among their faculty members and courses. The features of this app cater to a complete feedback environment where more features could be added in the near future to increase its functionality [13]. For example, we would suggest incorporating AI technology so that personalized suggestions from the feedback data for students and teachers can be given in the future. We would also like to add a suggestion box where students can put forward their suggestions and communicate directly with the managing authority. For the development of this application, we are using Java—an object-oriented programming language running on the Java Virtual Machine [14]. We are designing it on Firebase, a platform owned by Google that has offered real-time databases, authentication, hosting, and other services. The User Interface of the App and integration of modules, and different functionalities are being done in Android Studio [15]. We wish that an effective, comprehensive, and personalized feedback system for college and university students is realized with this app, subject to modifications according to the needs and requirements of the respective institutions. This app data will be beneficial in da ta-driven decision-making and will complement quality enhancement in education as a whole [16].

Features that are to be added in the future will make it more functional and build a better user experience with AI integration and provision for a chat room for students and faculty [17].

C. Future Proposed

In the future, AI technology shall support this feedback system of college and university students whereby it provides individual suggestions to the student and the teacher as per their feedback [18]. A zone for a chat room is also added which shall be instrumental in accommodating real-time communication between the student and faculty members. A website will also be developed which will provide API access to feedback data collected through the app, allowing colleges and universities to use the system in their individual capacities and meet their requirements [19]. The data for these shall, in turn, get analyzed to give more accurate insights. UED will also propose a website that contains all information about various colleges, including those items one does not find on other websites. This will help the students to make a better decision about pursuing their higher education and will enhance the chances of getting into better colleges.
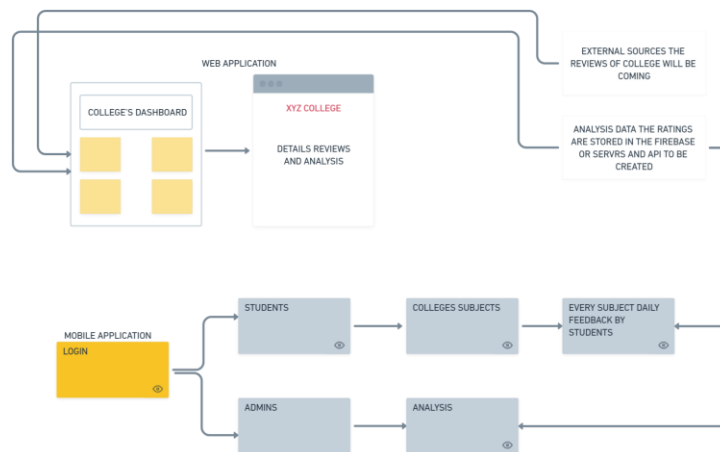

Fig. 1 Proposed Future Drawing

III. METHODOLOGY

The system to be proposed is an Android app and will be a Web application also, developed using a combination of languages in programming, frameworks, and libraries. The development process will go through several stages:

Requirement gathering: Understanding the requirements of the system, identification of features/functionalities to be implemented at this stage. This will be attained by surveys of students and faculty members.

System design: This is where the architecture of the system is developed, a data model defined, and a user interface designed. There will be tools like UML diagrams and wireframes in order to make a blueprint of the system. Development: It is at this stage that the system will be coded using Java, Android Studio, and Fire Base. There will also be a glide library that will be used to store data. Frontend design will be done using Tailwind and CSS for web applications, while on Android we use Android Studio XML to structure layout of apps on Mobile.

Testing: This phase will involve testing the system for bugs, errors, and inconsistencies. To check the system's quality, various types of testing techniques will be employed, which include unit testing, integration testing, and acceptance testing.

Deployment: The system will then be deployed on a server to be accessed by students and faculty. In the process, Firebase will be used for hosting, real-time database, and authentication.

Maintenance: It is where the system is maintained, bugs are fixed, additional features added, and updates made as requirements keep evolving. The maintenance is to be done regularly to make sure that the system has always remained functional and effective. The methodology will also be iterative in nature, because development has to involve incessant feedback and improvement. Feedback from students and faculty members will be availed and since it will be iteratively incorporated into the system, improved effectiveness and usability can be realized.

IV. RESULTS / OUTPUT

Result and Output: The research article discusses the reasons for the feedback management system in an educational institution, and introduces an 'Feedback Management System' that will focus on addressing the concern of students about the level of knowledge they receive using an android app. The Feedback System of the Faculty is an integral part of enhancing the quality of learning. It enables communication between students and teachers, highlights problems, and efficiently solves the grievances. Literature survey: The literature discusses the already existing Java-based college feedback systems available in the market, like Course Feedback System, Feedback System for Education, Student Feedback System, College Feedback System, and University Feedback System. The system to be developed will include an Android application and a web application. These shall be developed with a combination of the following programming languages, frameworks, and libraries: Java, Android Studio. Development shall be by different stages: requirement gathering, system design, development, testing, and deployment. The proposed system will provide an effective feedback management system for students and teachers, which will be helpful in the proper analysis of student and staff feedback. The new system gives students an easy and consistent way to provide their feedback to the HOD or Principal of the concerned college. This information will then be retrievable by the server, enabling the heads to be better informed about the teaching qualities of any particular college or teacher for easy analysis of daily performance. In general, the quality of education can be enhanced by ensuring communication between students and teachers through the proposed system and addressing the same concerns timely and efficiently. This shall be a very major tool for the college administration to monitor feedback and initiate steps towards betterment in quality of education.
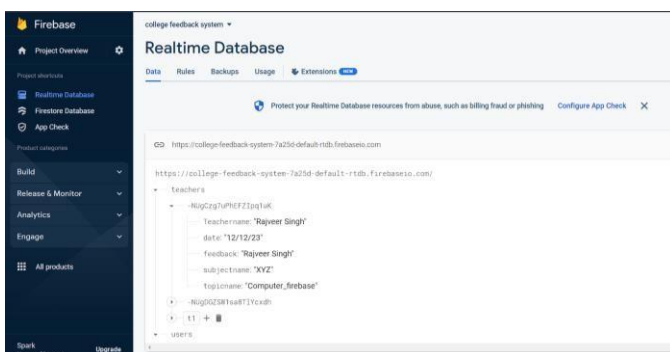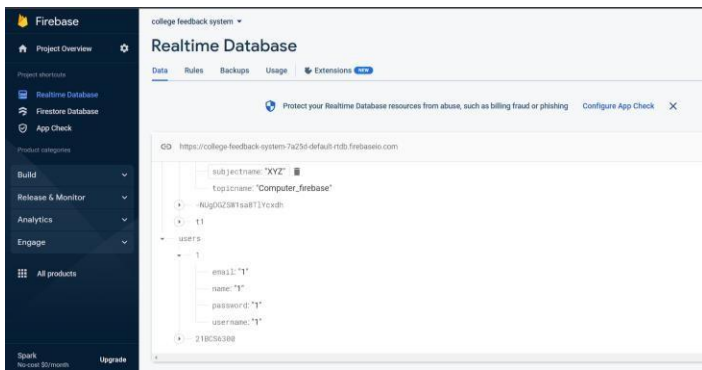
WIREFREAME:

1. Login Flow
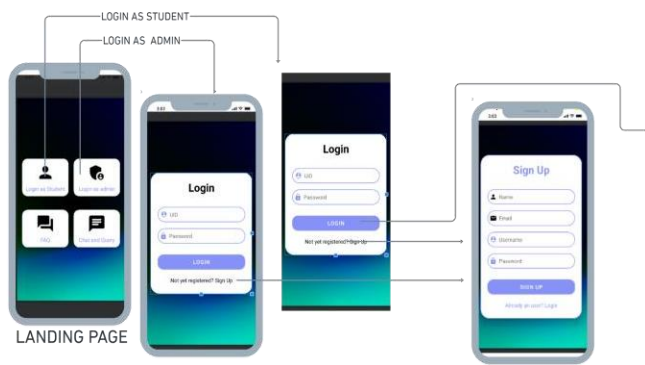
2. Feedback Adding

3. Firebase Data Storing Detail:

Teachers Details Saved:

Login and Signup details saved

V. CONCLUSION

A. The online feedback system acts as an ultimate solution for the institution of any educational center to collect and generate feedback from students with respect to their learning and teaching experience. The Feedback Management System strives to maintain a healthy relationship between the student, his/her surrounding environment where studies take place, and the student-teacher relationship. The Faculty Feedback System is one of the modules of the feedback management system in improving. It provides a convenient and consistent method for students to give their feedback to the Head of Department or the principal of the concerned college. An android app and a web application will be developed with the combination of programming languages, frameworks, and libraries in the proposed system. This development process will include requirement gathering, system design, development, testing, and deployment. The online feedback system is an invaluable tool to improve the quality of education in several aspects by way of better communication between students and teachers, detection of flaws and solution of problems quickly.

B. *Research Papers and Citation*

Literature Review Summary Year and Citation	Article/ Author	Source
2018 JANUARY	Rajvee Patel1, Omkar Agrawal2, Yash Gangani3 , Ashish Vishwakarma4	IRJET
March 2016	Birudeo Sangolkar, Kajal Yadav, Sandhya Shinde, Pranita Jadahv	International Journal of Research in Advent Technology
April 2018	Devesh Chinchole, 2Vishal lekhwani, 3Chetan Patil, 4Sudarshan Patil	IJCRT
16, 2016	Md. Mamoon-Al-Bashir, AHEA, Md. Rezaul Kabir, AHEA, Ismat Rahman	Journal of Education and Practice

VI.   REFERENCES

1.   Z. Kastrati, F. Dalipi, A. S. Imran, K. Pireva Nuci, and M. A. Wani, "Sentiment Analysis of Students' Feedback with NLP and Deep Learning: A Systematic Mapping Study," Applied Sciences, vol. 11, no. 9. MDPI AG, p. 3986, Apr. 28, 2021. doi: 10.3390/app11093986.

2.   R. Plutchik, "The Nature of Emotions," American Scientist, vol. 89, no. 4. Sigma Xi, p. 344, 2001. doi: 10.1511/2001.28.344.

3.   Cambria, B. Schuller, Y. Xia and C. Havasi, "New Avenues in Opinion Mining and Sentiment Analysis," in IEEE Intelligent Systems, vol. 28, no. 2, pp. 15-21, March-April 2013, doi: 10.1109/MIS.2013.30.

4.   R. Feldman, "Techniques and applications for sentiment analysis," Communications of the ACM, vol. 56, no. 4. Association for Computing Machinery (ACM), pp. 82–89, Apr. 2013. doi: 10.1145/2436256.2436274.

5.   L. Yang, Y. Li, J. Wang, and R. S. Sherratt, "Sentiment Analysis for E-Commerce Product Reviews in Chinese Based on Sentiment Lexicon and Deep Learning," IEEE Access, vol. 8. Institute of Electrical and Electronics Engineers (IEEE), pp. 23522–23530, 2020. doi: 10.1109/access.2020.2969854.

6.   P. Agarwal and A. Vij, "Assessing the Challenges and Opportunities of Artificial Intelligence in Indian Education," International Journal for Global Academic & Scientific Research, vol. 3, no. 1. International Consortium of Academic Professionals for Scientific Research, pp. 36–44, Apr. 04, 2024. doi: 10.55938/ijgasr.v3i1.71.

7.   A. E. O. Carosia, G. P. Coelho, and A. E. A. Silva, "Analyzing the Brazilian Financial Market through Portuguese Sentiment Analysis in Social Media," Applied Artificial Intelligence, vol. 34, no. 1. Informa UK Limited, pp. 1–19, Oct. 31, 2019. doi: 10.1080/08839514.2019.1673037.

8.   N. Capuano, L. Greco, P. Ritrovato, and M. Vento, "Sentiment analysis for customer relationship management: an incremental learning approach," Applied Intelligence, vol. 51, no. 6. Springer Science and Business Media LLC, pp. 3339–3352, Nov. 12, 2020. doi: 10.1007/s10489-020-01984-x.

9.   Kaushik, P. & Rathore, S. P. S.(2023). Deep Learning Multi-Agent Model for Phishing Cyber-attack Detection. International Journal on Recent and Innovation Trends in Computing and Communication, 11(9s), 680–686. https://doi.org/10.17762/ijritcc.v11i9s.7674

10.   A. S. Imran, S. M. Daudpota, Z. Kastrati, and R. Batra, "Cross-Cultural Polarity and Emotion Detection Using Sentiment Analysis and Deep Learning on COVID-19 Related Tweets," IEEE Access, vol. 8. Institute of Electrical and Electronics Engineers (IEEE), pp. 181074–181090, 2020. doi: 10.1109/access.2020.3027350.

11.   P. Chauhan, N. Sharma, and G. Sikka, "The emergence of social media data and sentiment analysis in election prediction," Journal of Ambient Intelligence and Humanized Computing, vol. 12, no. 2. Springer Science and Business Media LLC, pp. 2601–2627, Aug. 06, 2020. doi: 10.1007/s12652-020-02423-y.

12.   M. Yadav, M. Kakkar, and P. Kaushik, "Harnessing Artificial Intelligence to Empower HR Processes and Drive Enhanced Efficiency in the Workplace to Boost Productivity," International Journal on Recent and Innovation Trends in Computing and Communication, vol. 11, no. 8s. Auricle Technologies, Pvt., Ltd., pp. 381–390, Aug. 18, 2023. doi: 10.17762/ijritcc.v11i8s.7218.

13.   I. Sindhu, S. Muhammad Daudpota, K. Badar, M. Bakhtyar, J. Baber, and M. Nurunnabi, "Aspect-Based Opinion Mining on Student's Feedback for Faculty Teaching Performance Evaluation," IEEE Access, vol. 7. Institute of Electrical and Electronics Engineers (IEEE), pp. 108729–108741, 2019. doi: 10.1109/access.2019.2928872.

14.   Z. Kastrati, A. S. Imran, and A. Kurti, "Weakly Supervised Framework for Aspect-Based Sentiment Analysis on Students' Reviews of MOOCs," IEEE Access, vol. 8. Institute of Electrical and Electronics Engineers (IEEE), pp. 106799–106810, 2020. doi: 10.1109/access.2020.3000739.

15.   Z. Han, J. Wu, C. Huang, Q. Huang, and M. Zhao, "A review on sentiment discovery and analysis of educational big-data," WIREs Data Mining and Knowledge Discovery, vol. 10, no. 1. Wiley, Jul. 11, 2019. doi: 10.1002/widm.1328.

16.   J. Zhou and J. Ye, "Sentiment analysis in education research: a review of journal publications," Interactive Learning Environments, vol. 31, no. 3. Informa UK Limited, pp. 1252–1264, Oct. 01, 2020. doi: 10.1080/10494820.2020.1826985.

17. D. Moher, A. Liberati, J. Tetzlaff, and D. G. Altman, "Preferred Reporting Items for Systematic Reviews and Meta-Analyses: The PRISMA Statement," PLoS Medicine, vol. 6, no. 7. Public Library of Science (PLoS), p. e1000097, Jul. 21, 2009. doi: 10.1371/journal.pmed.1000097.

18. M. L. Barrón Estrada, R. Zatarain Cabada, R. Oramas Bustillos, and M. Graff, "Opinion mining and emotion recognition applied to learning environments," Expert Systems with Applications, vol. 150. Elsevier BV, p. 113265, Jul. 2020. doi: 10.1016/j.eswa.2020.113265.

19. D. Prakash, "Data-Driven Management: The Impact of Big Data Analytics on Organizational Performance," International Journal for Global Academic & Scientific Research, vol. 3, no. 2. International Consortium of Academic Professionals for Scientific Research, pp. 12–23, Jul. 02, 2024. doi: 10.55938/ijgasr.v3i2.74.