Creation of a model for a student support system based on intelligent agents

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Abstract: The project "design an intelligent agent-based student support system" involves creating a help desk system that serves as the main point of contact for students and the staff members of an educational institution's support team. Students in India open and distance learning institutions frequently experience issues with registration, missing grades, inaccurate e-wallet account balances, difficulty logging in to the portal, confusion about what is expected of them in a particular course, etc. When a student encounter any of these issues, finding a solution becomes very difficult. Therefore, the goal of this research project is to create a system that associates a help desk ticket with the appropriate service right away, reduce the time it takes to respond to tickets, save labor costs, and improve user satisfaction. A web-based application for student support services is presented in the work, allowing students to submit tickets regarding problems they are having with the open and distance learning systems. Student support tickets are prioritized by the system, which then automatically assigns them to the appropriate staff member for handling. Additionally, it integrates SMS into the platform to notify the support team as soon as a student raises a ticket. Additionally, it builds a knowledge-based system for an intelligent agent-based system that will improve the effectiveness of the student support services by automatically answering questions from students that are similar to ones that have already been answered. The approach used is what's important. PHP-MySQL with JavaScript and the oriented and design methodology (OODM) were employed in the implementation.

Keywords: Intelligent Agent, Payment Portal, SMS, Students

I. INTRODUCTION

One component used to assess how well an institution is doing its job of providing the necessary knowledge to empower society is support services. Successful student support programs at universities improve students' educational experiences and help them succeed academically. One of the key components in ensuring the quality of education is a support service. It contributes to a decrease in the dropout rate and an increase in the variety of student experiences. What is the support service? gives the students a feeling of community and ties them to the school. If they don't receive these supports, students are more likely to give up on their education. A complete graduate with all the traits of a complete person is produced with the aid of effective support systems. It fills in the gap that separates the students and the institution. When it comes to open and distance learning in India, the most common issues that students face are registration difficulties, missing grades, inaccurate e-wallet account balances, difficulty logging in to the portal, confusion about what is expected of them in a particular course, etc. When a student encounter any of these issues, finding a solution becomes very difficult. Most of the time, they are unsure of who to speak with in order to get the precise response to their difficulties. There is no option for students to communicate online with the directors of studies or the administration of the institution through the online portal accessible through India open and distance learning. Thus, this is a major issue that calls into question the program's ease of use and flexibility as designed by the institution's administrators. In order to address these issues with open and

remote learning, a student support services ticketing system is needed. One support service tool that helps organizations manage their services and support cases is a ticketing system. It establishes a structured communication channel, which greatly boosts an organization's productivity. The app or system develops a model for an intelligent agent-based student support system. "ticket," which keeps track of client inquiries and correspondence over time, facilitating the resolution of complex issues by support staff members within a unit. Using a ticketing system enhances support services and expedites the process of responding to service requests. Since we are aware that problems like human error and technical malfunctions will inevitably arise while we perform our duties, the ticketing system assists us in finding solutions as soon as possible and makes sure the appropriate parties are informed when they do. It will make it easier for us to keep track of every problem that is being fixed in each institution unit. Additionally, when students submit a ticket for assistance, the institution's system support staff is required to respond. answers the questions posed by the pupil. For these issues to be effectively addressed, prompt action is required. This is due to the fact that the majority of the problems that students face have a deadline. The portal might close if they don't receive the necessary response in a timely manner, and addressing the problem might no longer produce the desired outcomes. The support staff must therefore prioritize the tickets in order to determine which ones require immediate attention in order to improve the system's appearance of responsiveness and timeliness. Furthermore, it's possible that some of the concerns expressed by students were addressed in a prior ticket that was brought up by another student. How can student support services most effectively determine that a similar question has been addressed in the past continues to be one of the issues that must be fixed in order to improve the efficacy of student support services. An intelligent agent-based strategy is needed to accomplish this. Intelligent agent-based techniques were created to help promote effective and efficient student support services for open and distance learning in order to meet the research work's goal. Thus, this thesis suggests a novel framework that supports student support services and is driven by virtual assistance. The suggested framework enables the student support team to reply to tickets that students may submit at any moment. Additionally, the system assigns the tickets to the appropriate staff members who are in charge of handling such issues and prioritizes them automatically. The developed system is capable of to strengthen the bonds between students and staff in both open and remote learning settings in order to promptly address concerns brought up by learners. This will improve the learning system and, in turn, lower the program's dropout rate. This study creates a system that unifies everything into a single mode so that students can submit requests and receive responses as soon as possible within the allotted time. Since the majority of them balance their workload at the office with their studies, prompt responses to their inquiries help them feel like they belong. As a request is entered, the system learns from it and, using the answers, creates a list of frequently asked questions and their answers for subsequently submitted requests. In India open and distance learning institutions, Most frequently, registration issues, missing grades, inaccurate e-wallet account balances, difficulty logging in to the portal, confusion about what is expected of them in a particular course, etc. are faced by students. When a student runs into any of these issues, finding a solution becomes very difficult. They frequently don't know who to ask for help in order to receive precise answers to their problems. There is no option for students to communicate online with the directors of studies or the administration of the institution through the online student portal available for open and distance learning in India. Thus, this presents a significant challenge to the program's ease of use and flexibility as designed by the institution's authorities. Higher education support services continue to be one of the efficient methods for enhancing students' educational experiences. In open and distance learning, a weak and inefficient student support system results in the following: 1. Makes it difficult for the institution and the student to communicate. 2. Removes the student from institution activities, particularly when there is a problem to be resolved. 3. Causes a delay in the institution's response to student complaints. 4. Inadequate recording of the procedures followed in addressing the student's complaint The study's objective is to create a student support system based on intelligent agents. The following are the specific goals. The goal is to create an online application for student support services that will let students submit tickets for problems they are having with the open and distance learning systems. 2. To create a system that routes student support tickets based on priority and forwards them to the appropriate staff member automatically. 3. Including SMS on the platform to notify the support staff as soon as a student raises

a ticket. 4. To create a knowledge-based system for student inquiries and the support team's answers. 5. To create an intelligent agent-based system that will improve the effectiveness of the student support services by automatically answering questions from students that are similar to ones that have already been answered.

II.　REVIEW OF CONNECTED WORKS

A help desk system that serves as a lone point of contact for users and IT personnel was suggested by Feras (2021). It makes use of a precise machine learning model for ticket classification to correlate a help desk ticket with the appropriate service from the outset, reducing the amount of time needed to resolve the issue, saving money on staff, and improving user satisfaction. The following steps make up the empirically developed methodology that generates the model: creating training tickets, preprocessing ticket data, word stemming, feature vectorization, and fine-tuning machine learning algorithms. The training data's page containing the ticket description and comments was one of the primary factors that increased the model's prediction accuracy from 53.8% to 81.4%. Additionally, the system has an administrator view that makes it easier to define the services that are offered, manage tickets, administer user roles, and generate management reports. Additionally, it provides a user view that enables staff members to submit help desk tickets to the IT department in order to report problems, request services, and exchange information. Additionally, it allows collaborators to receive automated email notifications for additional action. However, it aids in the definition of business processes with clearly defined activities and the measurement of KPIs to evaluate the effectiveness of IT personnel and procedures. Antonio et al. (2020) suggested developing a recommender system to assist students in higher education with their choice of subjects to enroll in. They believed that higher education is essential in today's dynamic and complex world, and that the development of Data Mining techniques has led to a sharp increase in the body of scientific research devoted to predicting students' chances of succeeding academically or dropping out. Demand for degrees is rising, especially for those in computer science. Despite an increase in enrollment, there are still not enough graduates to meet society's demand for graduates. By presenting a strategy that not only forecasts students' performance or dropout risk but also acts to support both students and educational institutions, the study helped to turn the tide on the situation. By developing a recommender system to help students choose their subjects, the goal is to maximize graduation rates. The problem of building trustworthy recommender systems using data that is imbalanced, anonymized, sparse and few in quantity, and may have been stored in subpar circumstances is specifically addressed. The strategy was demonstrated its effective use in real-world settings by being applied to build a recommender system using a real-world dataset from a public Spanish university that contained performance data from a computer science degree course. The process of building a support system using that methodology is explained, its outcomes are assessed, and its consequences for academic achievement of students and graduation rates of educational institutions were examined. It was their intention to decrease the dropout rate and raise graduation rates by building the decision support system for students. Ratthida and Limpiyakorn (2019) delivered a paper entitled "IT Helpdesk Development using Micro Services." They suggested creating an IT helpdesk, which would be a system for users to report issues or provide specifications to IT teams so they can troubleshoot. The design of the IT helpdesk, which uses a micro service architecture to support system scalability, is presented in this paper. One aspect of the implementation is the classification service, which classifies tickets automatically and forwards them to the relevant IT teams for assistance. The subjects of the requests are grouped using the thesaurus database. The advantages of the suggested strategy were to strengthen the system's availability and allow for scalability. As a follow-up to the research, they suggested that the classification service be improved and that the ticket be enhanced to allow attachments . According to Kapil's (2019) research, "Machine Learning Based Support System for Students to Select Stream (Subject)", students' choice of subject or stream is important because it will determine how their career develops in the future. primarily topic/stream The choice made cannot be altered for a future career. Inadequate subject selection brought on by lack of knowledge, parental pressure, etc., can result in poor performance in the chosen field. Advice on choosing a subject or stream based on data from accomplished students in that field as well as student data about interests, family history, prior education, and other relevant factors can improve career

success. Based on the information above, data mining and machine learning techniques were created. For training and testing purposes, data from two distinct institutions and students from two different streams were used. A variety of machine learning algorithms were employed, and techniques with a high accuracy rate of 86.72% were created. They recommended that the developed method be expanded upon and applied to different subject/stream selection. Albert and associates (2020) According to their research, some businesses have set up help desks to handle internal complaints, but other procedures are still done by hand. Human operators manually categorize the helpdesk tickets. This process is prone to mistakes that cause numerous tickets to bounce to the incorrect business unit, which delays the processing of complaints. They suggested utilizing machine learning to automatically categorize problems according to the helpdesk ticket title. According to the results, the random forest classification has the highest accuracy (82%). Paraskevi (2014) suggested a Web-based IT Support System for first- and second-semester students at the Technological Educational Institution (T.E.I.) of Thessaloniki, Greece's Food Science department. The model of learning that has been employed is a blend of constructivist and objectivist techniques. The claimed that following conversations with both students and lecturers, it was discovered that the primary issues were the ineffective use of students' prior knowledge, the dearth of resources, and the short amount of time allotted for student support during lectures. In light of this, they made the decision to redesign the course using a learner-centered approach, based first on a problem-based learning approach (to better understand the students' attitudes and needs) and then, based on the findings, to create a Web-Based Information Technology Student Support System. The use of a portion of the web-based information technology system has improved students' methods of learning.Al-Hawari (2019) created a machine learning-based help desk system for King Saul's IT services administration. The system was able to categorize the tickets based on the services provided by the IT department using a machine and define user roles and responsibilities. Creation of a model for a student support system based on intelligent agents This system automates emails, but it did not account for the possibility of sending feedback via short message services. Short message services (SMS) are necessary in India, where internet connectivity is expensive and limited. This is because students may not always be online to track the progress of their requests; instead, they can check the status of their requests once they receive an update. The suggested support system will handle utilizing the short message services to provide information to the student and the officer at the help desk. They suggested a system for the University of Lagos that would let users store records of requests for appropriate documentation and get information about the university's support services. the mechanism that will identify, examine, and get rid of frequent issues within the organization. Additionally, the system will assist in gauging how well the organization uses the key performance indicator to resolve problems. Furthermore, the use of short message services for updating the help desk officer and the student was not examined by this system.

III. SUPPLIES AND APPROACH

The student support system will be designed using a few web application languages in order to ensure efficient project implementation. Among them are Hypertext Preprocessor and Hypertext Markup Language (HTML). Dream Weaver, Fireworks, MySQL, Java Script, and Cascaded Style Sheet (CSS). An HTML-based program called Dream Weaver is used to create graphical user interfaces. PHP and JavaScript are the scripting languages used in the system's development. JavaScript is used to give a web page functionality that goes beyond what standard HTML can offer. It makes a website more interactive. MySQL is open source software that is used in conjunction with PHP for the development of websites. These are the supplies required to fulfill the project's goals. This research project will use the object-oriented analysis and design methodology (OOADM), which is a set of guidelines for system analysis and application design. It approaches information system analysis and design with a formal, methodical approach. OOD, or object-oriented design, elaborates the analysis models in order to generate implementation guidelines.

IV.   EXAMINATION OF THE SUGGESTED SYSTEM

The purpose of the suggested system was to provide platforms for student support services. Students are supposed to raise tickets in the system with any grievances or inquiries. Although they have varying levels of access, both students and prospective students can use this system's features. After a ticket is raised, the system automatically sends an email and a short message service (SMS) to the support team members who are in charge of responding to the inquiries or complaints. It also stores the ticket in the database. Each ticket submitted through this system is categorized so that the user knows to whom and where to direct the complaint in order to receive a response. When the raised ticket is addressed, it also sends and notify the student who posed the question via SMS that the complaint has been addressed. Every complaint and question, along with the answers, are recorded and kept in a database. The purpose of the questions and answers is to create a knowledge base from which the machine learning will automatically gather information and address any concerns raised by students. This indicates that if a student raises a ticket and it resembles one that the support team has already addressed and is contained in the knowledge base, the new system will allow them to self-serve. In order to achieve this, the new system will always check the knowledge base whenever a new ticket is opened in order to determine whether a similar issue or question has already been addressed. When there are similarities, the system reacts to the complaint automatically; if not, the ticket is prioritized, classified, and sent to the support team member handling those inquiries. The tickets that students raise will be ranked in order of priority based on the intelligent agent's assessment of their urgency. Various issues that require assistance are given varying priority levels. Upon submission of the ticket by the student, the system will automatically designate a priority level, thereby identifying which ticket will receive a response ahead of others. It follows that the support staff handles tickets based on priority. Responses are ordered based on priority (urgency) rather than first come, first served. affixed to the ticket by the developed system. The tickets can be timed using the features in the new system. Along with recording the submission date and time, it also records the response time to the ticket. This will assist the system in producing reports on the promptness with which a ticket was answered and on the effectiveness of the people tasked with answering the tickets. Creation of a model for a student support system based on intelligent agents.

V.   Findings and Discussion

The software's performance was evaluated based on how quickly data could be retrieved and how accurately tickets were categorized and prioritized. The ticket data that is kept in the database serves as the foundation for the intelligent agent data. The basic data on the ticket (entered via the screen) and description are kept in the database table of the TICKET. In order to store the comments that collaborators exchanged about the tickets, the TICKET table is also linked to a TICKET Response table. Every ticket has a distinct ticket ID that is linked to a student ID. A great deal of valuable data is collected and produced by the student support system, allowing for the measurement of several key performance indicators (KPIs) that help staff and IT management make decisions. Examples of some of the KPIs that are measured are: Count of Tickets Answered The total number of tickets answered within a given time frame is determined by using this KPI.

It is evident that 6% (78) of the support tickets that the student brought up regarding their issue that appeared to be related to an admission requirement were addressed. 22% (277) of the tickets regarding semester result issues received a response. Responses were given to 3% (40) tickets regarding transcript issues, 1% (5) tickets regarding exam issues, 1% (15) tickets regarding test issues, 41% (520) tickets regarding admission application issues, and 3% (40) tickets regarding test issues. 15% (186) tickets on payment issues were answered, 8% (97) tickets on semester registration issues were answered, and 15% (186) tickets on course registration issues were addressed. Average Time for Ticket Response The average ticket response time over a given time period is determined using this KPI.

VI.   Conclusion

One of the most important issues facing most universities in developing nations is the student support system. For electronic data management to be implemented effectively, timely access to information

and information security are essential. With the help of this project, an intelligent agent-based student support system was created, giving students a way to submit tickets with their complaints and get prompt responses. least amount of time. Students are supposed to raise tickets in the system with any complaints or inquiries. When a ticket is raised, the system automatically sends a short message service (SMS) to the support team member who is in charge of responding to the inquiry or complaint and saves it in the database. Each ticket that is raised through this system is categorized so that the user knows to whom and where to direct the complaint for a response. The student who raised the ticket will also receive an SMS informing them that their complaint has been addressed once the ticket has been addressed. The intelligent agent-based student support system's implementation helps to create an auto-responder system that automatically addresses complaints from students. The sentient agent utilizes the knowledge base system from the queries that have already been addressed.

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