SUPPORT TIKCETING SYSTEM FOR EDUCATIONAL INSTITUTIONS

Prof.(Dr.) Ankita Karale[1] , Absharulhuda Sayed[2], Satyam Borade[3], Hitesh Shimpi[4],

Vineet Jadhav[5]

[1]Professor [2,3,4,5]Student

[1,2,3,4,5]Department of Computer Engineering

[1,2,3,4,5]Sandip Institute of Technology and Research Center®, Nashik, India.

---***---

Abstract - Support ticketing systems play a crucial role in improving communication and efficiency within educational institutions. This synopsis distils insights from prior research on implementing and using these systems in colleges and universities. The literature review emphasizes their significance in addressing student and staff issues and streamlining communication through structured platforms for ticket submission, categorization, and tracking. Integration of Artificial Intelligence (AI) models for ticket routing is noted for enhancing response times and directing tickets to the right departments. The benefits highlighted include improved user satisfaction, enhanced user experience with user-friendly interfaces, and mobile accessibility. The report stresses the importance of security and privacy measures to protect user data and maintain trust. Case studies demonstrate successful support ticketing system implementations in educational settings, presenting real-world challenges and solutions. The report recommends prioritizing features like system integration, accessibility, and thorough training for staff and users. In conclusion, this report provides a comprehensive overview of support ticketing systems in educational institutions, offering actionable recommendations for adoption or enhancement. As educational institutions evolve, implementing these systems is crucial for ensuring a responsive support ecosystem, contributing to smoother issue resolution and overall satisfaction among students and staff.

***Key Words*:** *Ticketing System, Tickets, Help-Desk, Educational institutions, Ticket routing, artificial intelligence.*

1. INTRODUCTION

The project's scope revolves around the development of an AI-powered support ticketing system designed specifically for a college campus. This encompassing system includes user-centric elements, such as registration, login, and profile management, providing a seamless experience for both students and staff. The core innovation lies in the application of natural language processing and machine learning to intelligently route support tickets based on content, department, and difficulty level, significantly expediting issue resolution. Real-time push notifications serve as a conduit for immediate communication between users and support authorities, ensuring that urgent matters are addressed promptly. In parallel, a robust database securely stores user data, ticket information, and feedback, while an administrative dashboard empowers support authorities to efficiently manage and monitor tickets. The system's adaptability to various college departments and scalability for handling increasing user and support request volumes are key considerations, alongside reporting and analytics tools for data-driven insights. Additionally, privacy compliance, usability, and continuous improvement mechanisms are integral to this comprehensive project's objectives, all within a defined timeline and resource constraints.

2. LITERATURE SURVEY

"Question Classification Framework for Helpdesk Ticketing Support System using Machine Learning " 1 st Noor Aklima Harun, 2 nd Sharin Hazlin Huspi, 3 rd Noorminshah A.Iahad in 2021 , The main objective of this research is to develop an automated question classification model for Helpdesk Ticketing Support (HTS) System. The research is divided into two parts: (1) a study related to the pattern of question data in HTS and (2) to explore Naïve Bayes (NB) and Support Vector Machine (SVM) algorithm as the question classification model. [1]

"Hyperparameter Black-Box Optimization to Improve the Automatic Classification of Support Tickets" Renato Bruni 1,*, Gianpiero Bianchi 2 and Pasquale Papa 3, 2023, This study explores the potential of natural language processing (NLP) models in categorizing and routing support tickets effectively. It highlights the efficiency gains and resource optimization achievable through AI integration. [2]

"Ticket automation: An insight into current research with applications to multilevel classification scenarios" Alessandro Zangari, Matteo Marcuzzo, Michele Schiavinato, Andrea Gasparetto, Andrea Albarelli in 2023, Focusing on user experience, this paper discusses the importance of user-friendly interfaces and mobile accessibility in ticketing systems. It emphasizes the impact of these design considerations on multi-level user satisfaction. [3]

"Design of Work Ticket System and Scheduling Algorithm based on Blockchain" Hongkai Wang, Yiyang Yao, Qitong Hou, Xiaoyi Wang, Lei Zeng, Weiwei Qiu in 2020, The blockchain-based work ticket system proposed in this paper combines the decentralization, openness, tamper-proof modification, and traceability characteristics of blockchain technology. Compared with the traditional work ticket system [4]

"A machine learning based help desk system for IT service management" Feras Al-Hawari, Hala Barham, 2019, The capabilities of an in-house help desk system that meets the

ongoing customization IT needs of the GJU were introduced in this paper. The system enables users to report an issue, submit a service request and communicate with an IT agent through help desk tickets. It also supports prioritizing a ticket, classifying a ticket, assigning a ticket to an agent, editing a ticket description using a rich text editor, exchanging ticket comments amongst collaborators, and changing the ticket status [5]

"Automated Assignment of Helpdesk Email Tickets: An Artificial Intelligence Life-Cycle Case Study " Shivali Agarwal, Jayachandu Bandlamudi, Atri Mandal, Anupama Ray, Giriprasad Sridhara in 2020, In this article, authors have proposed an end to end ticket dispatch automation system that encapsulates the full AI life cycle. The proposed system achieves human-level accuracy and has already been deployed successfully for six customers in production. [6]

"SupportNet: Neural Networks for Summary Generation and Key Segment Extraction from Technical Support Tickets" Vinayshekhar Bannihatti Kumar Mohan Yarramsetty Sharon Sun Anukul Goel in 2021, Authors tried to scale the support business with our rapid user growth. We describe two components of a system that aims to reduce the time spent by SE in resolving a support case. The aim of this work is to promote research at the intersection of NLP and support business.[7]

"Using Clustering for Categorization of Support Tickets" Daniel Beneker and Carsten Gips in 2017, The goal of this work was the unsupervised categorization of support tickets. According to latest research, there is no distinct solution for this. Especially the automatic naming of the calculated categories is not easy to solve. The result of a categorization is strongly dependent on the data set and the cluster algorithm. In addition, the quality of the categorization is difficult to evaluate.[8]

"HelpDesk Ticketing System" Yashraj Chanchad1, Suraj Kanade2, Prof. Ranjana Singh in 2023, A successful helpdesk ticketing system will automate the process of raise the tickets for queries, check status of the ticket & get exact solution for the queries with the help of three tier architecture. It will also result in the solution of the queries in the possible earliest time.[9]

"Ticketing System" Florika Gohil1, Mr. Vikash Kumar2 in 2019, Thusly it tends to be inferred that the task is performed by seeing all modules of it. The achievability and prerequisites for these modules are checked. It has been discovered that every one of these modules can be executed all around proficiently and on account of that clients have simple access to their information with secure confirmation.[10]

3. PROPOSED SYSTEM

The user engagement with the support ticketing system unfolds in a systematic manner. Firstly, users, comprising students, faculty, or staff, generate tickets through a user-friendly interface accessible on various devices. Subsequently, Natural Language Processing (NLP) models come into play, automatically categorizing and routing tickets based on their content. This analytical process determines the ticket's nature and directs it to the relevant department or support team responsible for addressing the specific issue.

As the support ticket progresses, the system ensures real-time updates through a simultaneous database update. Critical details such as ticket ID, user information, category, submission time, and status are recorded to maintain an accurate representation of the evolving ticketing landscape. The ticket seamlessly reaches the respective department, ensuring that the right individuals or teams are promptly notified and can commence addressing the query efficiently.

Throughout the resolution journey, users stay informed with regular updates on the status of their tickets. These updates encompass acknowledgments of ticket receipt, estimated resolution times, and notifications when the query is assigned to a support agent. Upon resolution, users are promptly notified, providing them with the option to close the ticket. Post-resolution, the system encourages user engagement through reviews and feedback, fostering a continuous improvement cycle based on user satisfaction levels and valuable suggestions.

The support ticketing system's efficiency is further augmented by its capacity for data analytics and reporting. The system continuously collects and stores data related to ticketing activities, empowering administrators to monitor trends, response times, and departmental performance. This data-driven approach enables continuous improvement, wherein user feedback and analytical insights inform enhancements to the system over time. This iterative process includes refining NLP models, optimizing routing algorithms, and enhancing the overall user interface.
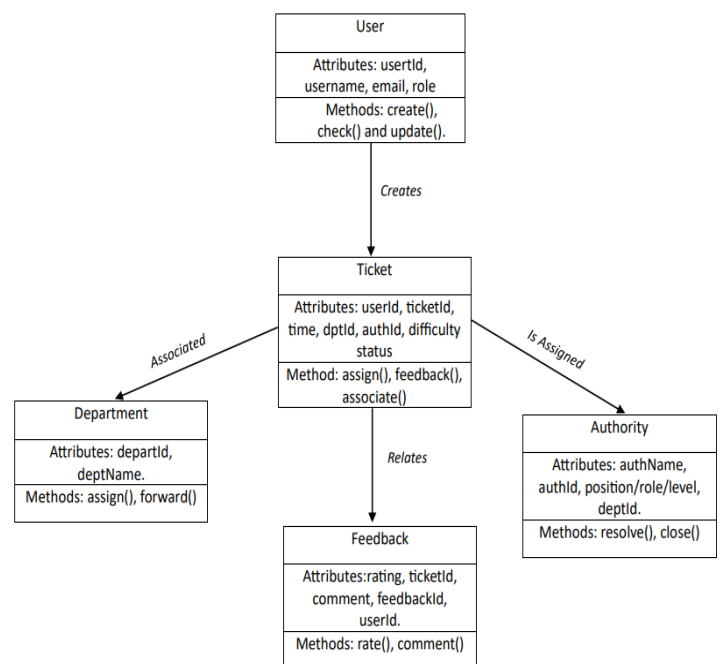

Fig 1 Class Diagram.

4. FUTURE SCOPE

Integration with IoT Devices: The system aims to seamlessly integrate with IoT devices and sensors across the campus. This integration facilitates automatic ticket generation for a spectrum of issues, including equipment malfunctions, temperature control, or security breaches. By tapping into the data provided by IoT devices, the system ensures a swift response to emerging problems, enhancing overall efficiency.

Multilingual Support: Recognizing the diverse cultural backgrounds within the campus community, the system will be augmented to provide multilingual support. This enhancement acknowledges the importance of effective communication in different languages, ensuring that the support system is accessible and user-friendly for individuals from various linguistic backgrounds.

Chatbot Integration: The incorporation of chatbots is proposed to streamline user interactions and query resolution. Chatbots, powered by artificial intelligence, can deliver immediate responses to common support queries. This not only expedites issue resolution but also contributes to an enhanced user experience, promoting user satisfaction through efficient and responsive communication.

Predictive Analytics: The system's evolution includes the implementation of predictive analytics using AI. By analyzing historical data and identifying patterns, the system can predict potential support issues. This proactive approach allows for anticipatory measures, preventing problems before they escalate and ensuring a more stable support environment.

Voice and Speech Recognition: To further diversify user interaction, the system proposes the integration of voice and speech recognition technology. This feature empowers users to submit support requests and interact with the system using voice commands, adding a layer of convenience to the support ticketing process.

5. CONCLUSION

In conclusion, the development of an AI-based support ticketing system for a college campus marks a significant stride in elevating the efficiency of support services within an educational institution. By leveraging machine learning and artificial intelligence, the system intelligently directs support requests to the appropriate departments, expediting issue resolution through real-time communication via push

notifications. Emphasizing user accountability and feedback fosters transparency and continuous improvement, promoting user satisfaction and aligning support services with the college campus's specific needs. The project utilizes AI and ML to streamline processes, offering valuable insights through data analytics, enabling informed decision-making and resource allocation. However, the project's success hinges on meticulous attention to security, privacy compliance, and user training. The system's adaptability to evolving learning environments and scalability are pivotal for sustained effectiveness as the college campus evolves. In essence, this forward-thinking AI-based support ticketing system promises efficient, user-centric support services, utilizing cutting-edge technology to enhance the overall experience for students, staff, and administrators while optimizing resource allocation and decision-making.

REFERENCES

[1] "Question Classification Framework for Helpdesk Ticketing Support System using Machine Learning " 1 st Noor Aklima Harun, 2 nd Sharin Hazlin Huspi, 3 rd Noorminshah A.Iahad published by IEEE in 2021

[2] Renato Bruni 1,*, Gianpiero Bianchi 2 and Pasquale Papa "Hyperparameter BlackBox Optimization to Improve the Automatic Classification of Support Tickets." January 2023, Published by MDPI in 2023

[3] Alessandro Zangari a,1 , Matteo Marcuzzo a,*,1 , Michele Schiavinato a,1 , Andrea Gasparetto b and Andrea Albarelli, "Ticket automation: An insight into current research with applications to multi-level classification scenarios", Published by Elsevier Ltd. 2023

[4] Hongkai Wang, Yiyang Yao, Qitong Hou, Xiaoyi Wang, Lei Zeng, Weiwei Qiu "Design of Work Ticket System and Scheduling Algorithm based on Blockchain" IEEE, 2020.

[5] Feras Al-Hawari , Hala Barham "A machine learning based help desk system for IT service management" Published by Elsevier in 2019

[6] Shivali Agarwal, Jayachandu Bandlamudi, Atri Mandal, Anupama Ray, Giriprasad Sridhara "Automated Assignment of Helpdesk Email Tickets: An Artificial Intelligence Life-Cycle Case Study" Published by AI Magazine in Sept 2020

[7] Bannihatti Kumar, V., Yarramsetty, M., Sun, S., & Goel, A. (2021). SupportNet: Neural networks for summary generation and key segment extraction from technical support tickets. In Proceedings of the 4th workshop on E-commerce and NLP [8] Beneker, D., & Gips, C. (2017). "Using clustering for categorization of support tickets." In M. Leyer (Ed.), CEUR Workshop Proceedings: vol.1917, Lernen, wissen, daten, analysen (lwda) conference proceedings (pp. 51–62). CEUR-WS.org

[9] Yashraj Chanchad1, Suraj Kanade2, Prof. Ranjana Singh3 in 2023 "HelpDesk Ticketing System" published by IJIRT.

[10] Florika Gohil | Mr. Vikash Kumar "Ticketing System" Published in International Journal of Trend in Scientific Research and Development (ijtsrd), ISSN: 2456- 6470, Volume-3 | Issue-4, June 2019, pp.155-156.

[11] Dingding Wang, Tao Li, Shenghuo Zhu, and Yihong Gong "iHelp: An Intelligent Online Helpdesk System" IEEE TRANSACTIONS ON SYSTEMS 2011

[12] Dhiraj Temkar1, Sheetal Singh2, Leema Bari3,Prof. Snigdha Bangal4 "Smart Help Desk Automated Ticketing System" in 2021 published by IRJET.

[13] M.Nagendramma, Shaik.Ghouse Basha, Md.Parveen Begum "Implement Helpdesk System Through Online" in 2012 published by International Journal of Engineering Research & Technology.

[14] Zeng, C.; Zhou, W.; Li, T.; Shwartz, L.; Grabarnik, G.Y. Knowledge Guided Hierarchical Multi-Label Classification Over Ticket Data. IEEE Trans. Netw. Serv. Manag. 2017

[15] Han, J.; Akbari, M. Vertical Domain Text Classification: Towards Understanding IT Tickets Using Deep Neural Networks. In Proceedings of the AAAI Conference on Artificial Intelligence 2018, New Orleans, LA, USA, 2–7 February 2018.

[16] Yayah, F.C.; Ghauth, K.I.; Ting, C.-Y. The automated machine learning classification approach on telco trouble ticket dataset. J. Eng. Sci. Technol. 2021

[17] Wei Zhou, Takami Yasuda, Shigeki Yokoi, "EnamoSupport: A Web-Based Helpdesk Support Environment for Senior Citizens" Volume 1, 2007, pp 295-306.

[18] B. Walek. Intelligent system for ordering incidents in helpdesk system. In 2017 IEEE 21st International Computer Science and Engineering Conference (ICSEC). 2017 Nov,

[19] Neha Atul Godse, Shaunak Deodhar, Shubhangi Raut, and Pranjali Jagdale. 2018. Implementation of chatbot for itsm application using ibm watson. In 2018 Fourth International Conference on Computing Communication Control and Automation (ICCUBEA), pages 1–5. IEEE.

[20] Meng, J., Li, Y., Liu, C., Dong, Y., Wang, Z., & Zhang, Y. (2021). Classification of customer service tickets in power system based on character and word level semantic understanding. In 2021 china international conference on electricity distribution (pp. 1062–1066).