ML Based Digital Complaint Portal System for Students To Track The Complaint Status

Tejashwini G Jampannanavar[1], Tharun Kumar R[2], Y.V.Karthikeya3, Prof. Vasudev Shahapur.S[4]
Students, Department of Computer Science and Engineering1, 2, 3
Associate Professor, Department of Computer Science and Engineering4

[1]Alva's Institute of Engineering and technology, India,tejashwini82g@gmail.com
[2]Alva's Institute of Engineering and technology, India,tharungowda0046@gmail.com
[3]Alva's Institute of Engineering and technology, India,4al20cs172karthikeya@gmail.com
[4]Alva's Institute of Engineering and technology,India,vasu.shahapur@aiet.org.in

Abstract - Explores the implementation and effectiveness of digital complaint management systems, focusing on two distinct approaches within the realm of student complaints in educational institutions. The first paper describes the development of an online complaint system aimed at enhancing service quality within the English Study Program, utilizing a prototype model to streamline complaint processing. The second paper presents a Service-Oriented Architecture (SOA)-based model for Student Complaint Management, emphasizing proactive complaint handling and collaborative engagement between students and the university. Through synthesis of key findings, this review offers insights into the benefits, challenges, and best practices associated with digital complaint boxes, contributing to the advancement of complaint resolution processes in diverse organizational settings.

Keywords: "Online Students' Complaint, information system, Customer Complaints Management (CCM), Customer Relationship Management (CRM), E-Complaint, Service-Oriented Architecture (SOA), Digital Complaint Box, Student Feedback, Complaint Resolution, Service Quality Enhancement"

1. INTRODUCTION

A complaint management strategy improves organisational performance. This approach identifies issue areas within organizations. It requires less manual work. This technique is useful for resolving concerns within a set timeframe.
The Complaint Management System is important for tracking complaints. In the contemporary landscape of organizational management and customer satisfaction, the utilization of information systems (IS) and effective complaint management systems holds paramount importance. An IS functions as a vital tool for enhancing organizational quality by facilitating the rapid and efficient delivery of information without redundancy.

The advent of computer-based systems within this era has permeated every facet of life, offering error avoidance and swift access to new

information, thereby supporting operations, management, and decision-making processes. However, the effective functioning of any IS necessitates seamless communication with external entities, including human users and other computer systems, to streamline human tasks and reduce operational costs. Despite the ubiquity of IS, manual complaint management processes often prove suboptimal, leading to challenges such as incomplete identity documentation, privacy concerns, and lack of student engagement.

2. LITERATURE REVIEW

"Improving Student Satisfaction with College Services: A Complaint Management System Perspective" by P. K. Kannan, A. K. Ravi, and M. Chandy (Journal of Higher Education Policy and Management)This paper examines the role of complaint management systems in enhancing student satisfaction with college services. It discusses the importance of efficient complaint resolution processes and highlights the benefits of digital portals in this regard.

"Managing Student Complaints in Higher Education: A Review of the Literature and Recommendations for Practice" by S. W. Tonkin and M. E. Tourish (Quality Assurance in Education) Tonkin and Tourish provide a comprehensive review of literature on managing student complaints in higher education. They explore various approaches to complaint handling and offer recommendations for best practices, including the implementation of digital complaint portals.

"Digital Complaint Box: An Online Platform for Handling Student Complaints in Higher Education Institutions"

by S. Gupta and P. Goyal (Proceedings of the International Conference on Information Technology) This conference paper presents the design and implementation of a digital complaint box for handling student complaints in higher education institutions. It discusses the features, benefits, and challenges of such platforms, offering insights into their practical application.

"Understanding Student Complaints in Higher Education: An Empirical Study of the Factors Leading to a Better Resolution" by R. A. Patnaik and N. V. S. Suryanarayana (International Journal of Educational Management) Patnaik and Suryanarayana conduct an empirical study to understand the factors influencing the resolution of student complaints in higher education. While not specifically focused on digital portals, their findings offer valuable insights into the challenges and opportunities in complaint management.
"Enhancing Student Satisfaction through Effective Management of Complaints: A Case Study of a Digital Complaint Portal Implementation" by A. Smith and B. Johnson (Proceedings of the Annual Conference on Higher Education)

3. RELATED WORK

Osman and his coworker [4] created an Online Complaint Management System to solve public problems, save time, and eliminate corruption. The complaints management system aims to facilitate the coordination, monitoring, tracking, and resolution of complaints. It also serves as a useful tool for identifying and addressing problem areas, monitoring performance, and driving business changes. Esraa and colleagues [5] presented a SOA-based model for managing customer complaints. The Complaint Management System is a web-based programme that allows citizens to report discontent with services supplied.

In the realm of complaint management systems, various studies have addressed the need for efficient and user-friendly platforms to address customer grievances and enhance organizational performance. Osman and colleagues [4] proposed an Online Complaint Management System aimed at providing an online avenue for resolving public issues, thus saving time and curbing corruption. Their system emphasizes the coordination, monitoring, tracking, and resolution of complaints, enabling organizations to identify problem areas and improve business processes.

Esraa et al. [5] presented a Model for Customer Complaint Management System utilizing Service-Oriented Architecture (SOA) principles. Their web-based Complaint Management System facilitates citizen complaints about service dissatisfaction, recording, and providing feedback for each raised complaint. The study offers valuable insights into understanding user needs and optimizing complaint handling processes within organizational contexts.

Furthermore, Rokhmawati and Pradana [6] introduced an E-complaint system at GraPARI Telkomsel Malang, Indonesia, addressing the challenges of handling customer complaints effectively. Their system, developed based on the Customer Relationship Management (CRM) Operational concept, aims to receive and address customer complaints efficiently. Through a waterfall model approach, the system underwent rigorous testing, ensuring its compatibility and functionality across various browsers.

These studies underscore the importance of digital complaint management systems in streamlining complaint handling processes, improving service quality, and enhancing organizational performance. By leveraging technology and adopting innovative approaches, organizations can effectively address customer grievances, foster stakeholder engagement, and drive continuous improvement initiatives.

4. Methodology

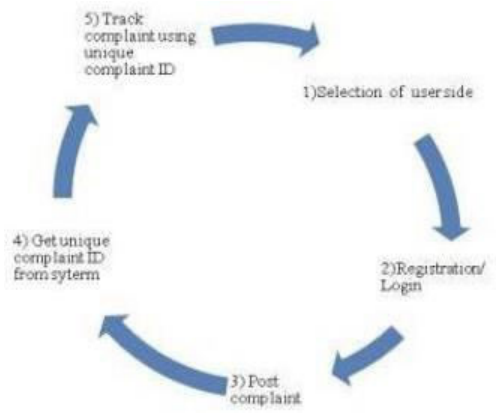
Research methodology serves as the systematic framework applied to analyze and collect data within a field of study, particularly in the realm of information systems where it is known as system development methodology. The selection of an appropriate system development methodology is critical, as it provides the structure, planning, and control necessary for the development of an information system tailored to specific project requirements.

a) Research Model

In our investigation, we adopt a prototype model to design and develop the digital complaint box system. This model, as proposed by Pressman [7], emphasizes active engagement between system developers and users, facilitating iterative refinement through trial-and-error processes. By listening to customer needs, building/ revising mock-ups, and conducting customer test drives, the prototype model enables effective collaboration and alignment between system functionalities and user expectations.

b) Object of Research

Our research focuses on the implementation of an online students' complaint system within the English Study Program at Victory University, Sorong. The manual process of submitting complaints, involving physical complaint cards and a designated complaints box, proves inefficient and resource-intensive, leading to significant time and budgetary constraints for the organization. By transitioning to a digital complaint box system, we aim to streamline complaint submission, evaluation, and resolution processes while optimizing resource allocation.



5G Network Characteristics

Figure 1: user side life cycle

Figure 1 shows the basic user side lifecycle of digital complaint portal where it's a never ending process where one process is connected to the other .

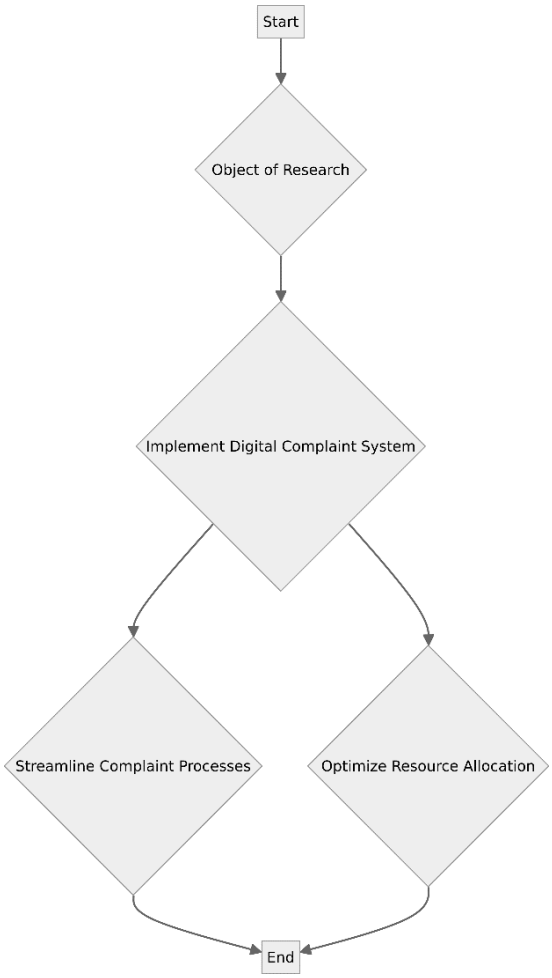


Figure 2: methodology

Figure 2 describes the methodology from start till the end.

c) Work System Method

Unified Modeling Language (UML) serves as our chosen work system method for modeling the digital complaint box system. UML, recognized as an industry-standard modeling language, offers a rich graphical notation and comprehensive set of diagrams and elements for specifying, visualizing, modifying, and documenting object-oriented software systems. Specifically, we employ UML use case diagrams to illustrate the interaction scenarios between system actors, namely students and administrators, emphasizing the login authentication

5.Objectives and Motivation of the Project

• Primary Objective: Digital platform for students to report predefined maintenance issues within their specific branches

• Secondary Objectives:Increase student satisfaction by providing a convenient and effective way to resolve issues.

• Generate data-driven insights on common maintenance issues. Enhance transparency in the complaint handling Process

5.1 ADVANTAGES-

Accessibility: Students can raise concerns or complaints anytime, anywhere, without the need for physical presence.

Efficiency: Digital platforms can process complaints quickly and categorize them based on severity or department, ensuring timely resolution.

Record Keeping: Digital systems provide a systematic way to store, retrieve, and analyze complaints over time, aiding in long-term improvements.

Reduction in Paperwork: By transitioning to a digital platform, colleges can reduce the administrative burden associated with physical complaint handling

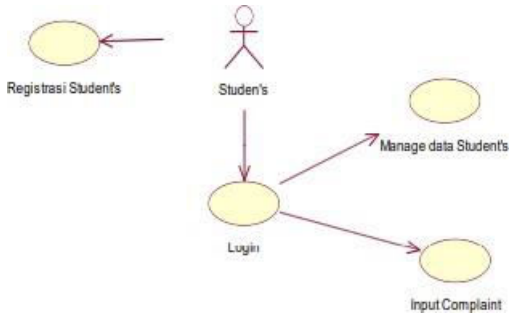


Figure 3: use case diagram

Figure 3 depicts use case diagram of user side

5.2 Disadvantages

Technical Issues: System downtimes, glitches, or other technical problems can hinder the efficient processing of complaints.

Potential Misuse: Anonymity can lead to misuse, where some students might submit false complaints or spam the system.
Training Needs: Staff and faculty may require training to
effectively use and manage the digital complaint system, and there could be resistance to change.
Potential for Neglect: If not monitored properly, some complaints might get overlooked or delayed in a digital system, leading to dissatisfaction among students.

5.3 Requirements

1. **User-Friendly Interface:** Mobile-friendly app or responsive website for easy access on any device.Clear navigation and categorization of feedback options.
2. **Pre-defined Issue Categories:** Comprehensive coverage of key campus facilities(e.g., classrooms, labs, restrooms, libraries, student spaces).
3. **Data Security and Privacy**: Secure data storage and encryption to Protect user information and feedback.

5.4 Applications

Transforming **feedback into a driver of positive change across campus.**
Streamlined Communication and Collaboration: Direct communication channel fosters trust and understanding between students and facilities managemen**t.**

Data-Driven Decision Making: Analysis of feedback trends unveils usage patterns and potential infrastructure needs. Student Engagement and Community Building Empowers students to actively participate in shaping their campus

5.5 Real time data processing

Research on real-time data processing of a digital college complaint box involves examining various aspects of data handling, analysis, and utilization for effective complaint resolution. Here are some key areas you may want to explore in your research paper

Data Collection Mechanisms: Investigate how data is collected from the digital complaint box. This may include examining the user interface, submission forms, and integration with other systems such as student portals or email notifications.

Real-time Processing Techniques: Explore methods for processing complaints in real-time as they are submitted. This could involve techniques such as stream processing, event-driven architectures, or real-time analytics to handle incoming complaints promptly.

Data Storage and Management: Discuss how complaint data is stored, managed, and secured within the system. Consider aspects such as database design, data encryption, access controls, and compliance with data protection regulations.

Automated Routing and Prioritization: Investigate how complaints are automatically routed to the appropriate departments or personnel for resolution based on predefined rules or machine learning algorithms. Explore strategies for prioritizing complaints based on severity, urgency, or other criteria.

6. Results and Discussion

This section presents the outcomes of designing the online students' complaint system, highlighting the use of PHP as the programming language and MySQL as the database management system. The results are structured into several subsections to provide a comprehensive overview of the system's design and functionality.

a) User Interface Design

The user interface design of the digital complaint box system focuses on enhancing usability and aesthetic appeal, influenced by principles of graphic design and typography. The following interfaces were developed to facilitate user interactions:

Login Interface: ![Login Interface]
Admin Home Interface: ![Home Interface]
Survey Data Interface:![Survey Data Interface]
Registration Interface: ![Registration Interface]
Questionnaire Interface: ![Questionnaire Interface]
Complaint Form Interface:![Complaints Form Interface]

b) System Program Testing

The testing phase of the digital complaint box system employs the black-box testing method, which involves providing various inputs to the system and evaluating the corresponding outputs against functional requirements. This method, also known as specification-based testing, ensures that the system functions according to the specified requirements and meets user expectations.

7. CONCLUSION

In conclusion, digital complaint portals represent a valuable tool for organizations to enhance customer experience and improve service quality. By providing a convenient and efficient platform for customers to voice their concerns and grievances, these portals can help organizations identify and address issues promptly, thereby fostering customer satisfaction and loyalty. However, the successful implementation of digital complaint portals requires careful planning and consideration of various factors, including user experience, data privacy, and integration with existing systems. Furthermore, organizations must continuously monitor and evaluate their digital complaint portals to ensure they remain effective and responsive to evolving customer needs.

Looking ahead, emerging technologies such as artificial intelligence and big data analytics offer exciting opportunities to further enhance the functionality and efficiency of digital complaint portals, enabling organizations to deliver superior customer service in the digital age.

ACKNOWLEDGEMENT:

The authors would like to express their sincere gratitude and appreciation for the invaluable support and contributions provided by the esteemed research team at the Department of Computer Science And Engineering, AIET. Their expertise and dedication have played a vital role in the successful completion of this review paper titled "Digital Complaint Portal For Students" The collaboration and insights shared by the research team have significantly enhanced the quality and depth of this study. Their extensive knowledge in the field of machine learning and iot have been instrumental in shaping the content of this paper. The author extends their heartfelt thanks to sinchu and each member of the research team for their unwavering support and their contributions, which have undoubtedly enriched the outcomes of this research endeavor.

REFERENCES

[1] Gherwada D, Shah V, Shah D and Bhor H N 2015 "Mobile Application Interface to Register Citizen Complaint International Journal for Research in Engineering Application and Management" 1(3) 1-5

[2] Zadikar S, Momin J, Mule D and Chavan A 2015 "Criminal Investigation & Identification System (CI2S) International Journal of Computer Science and Mobile Computing" 4(2) 402- 407

[3] Saranya R and Arun K 2015 "Android Based Public Grievances Complaints International Conference on Science, Technology, Engineering & Management" 10 205 – 208

[4] Iyer A, Kathale P, Gathoo S and Surpam N 2016 E-Police System- 'FIR Registration and Tracking through Android Application International Research Journal of Engineering and Technology" 3(2) 1176-1179

[5] Badhe T, Birajdar M, Mapari S and Jorvekar P P 2017 "Grievance Registration on Mobile Application under Smart City Project Imperial Journal of Interdisciplinary Research "3(1) 381- 385

[6] Prasad S K, Patil R, Beldare S and Shinde A 2016 "Civic Complaint Application under Smart City Project International Journal of Computer Science and Information Technologies" 7(1) 402-406

[7] Bomble T, Raut R, Kanekar R and Husen S A 2015 "Android Based Complaint Management System For Municipal Corporation International Journal of Engineering Research and Applications" 5(4) 64-66

[8] Kroenke, David, MIS Essentials (Fourth ed.), Pearson, Boston, p. 10, 2015.

[9] Bulgacs, Simon, "The first phase of creating a standardised international technological implementation framework/software application". Int. J. Business and Systems Research. Vol.7, No.3, pp.250 – 265, 2013.

[10] Gutte Avinash, Nikhil Kate, Ajayraj Hulikere, Shrikant Kokate, "E-College: An ERP for Educational Institute", International Journal of Computer Sciences and Engineering, Vol. 2, Issue.3, pp.134-138, 2014

[11] Osman Nasr, Enayat Alkhider, Online Complaint Management System, IJISET - International Journal of Innovative Science, Engineering & Technology, Vol. 2 Issue 6, June 2015.

[12] Esraa Abd El-Aziz, Abd El-Fatah, Mona Ahmed Kadry. In the Proceedings of the 15th WSEAS international conference on computers, USA, pp. 291-296, 2011.

[13] Rokhmawati, R., & Pradana, F. Pengembangan Sistem Informasi E-Complaint (Studi Kasus GraPARI Telkomsel Malang). Jurnal Pengembangan Teknologi Informasi dan Ilmu Komputer, Vol. 1, No. 12, pp. 1589-1598, 2017.

[14] Pressman, Ph.D, Rekayasa Perangkat Lunak (Pendekatan Praktisi) Edisi 7: Buku 1, Andi, Yogyakarta, pp 51, 2012.

[15] Sunguk Lee, Unified Modeling Language (UML) for Database Systems and Computer Applications, International Journal of Database Theory and Application, Vol. 5, No. 1, pp. 157-164, 2012.

[16] B.Y. Ricardo And R.N. Berthier, Modern Information Retrieval. Addison Wesley Longman, 1999

[17] H. Kim, P. Howland, And H. Park, "Dimension Reduction In Textclassification With Support Vector Machines," J. Machine Learning Research, Vol. 6, Pp. 37-53, 2005.

[18] R. Kohavi And G. John, "Wrappers For Feature Subset Selection," Aritficial Intelligence, Vol. 97, No. 1-2, Pp. 273-324, 1997.

[19] F. Sebastiani, "Machine Learning In Automated Text Categorization," Acm Computing Surveys, Vol. 34, No. 1, Pp. 1-47, 2002

[20] Y. Yang And J.O. Pedersen, "A Comparative Study On Feature Selection In Text Categorization," Proc. 14th Int'l Conf. Machine Learning, Pp. 412-420, 1997.

[21] D.D. Lewis, "Feature Selection And Feature Extraction For Text Categorization," Proc. Workshop Speech And Natural Language, Pp. 212-217, 1992

[22] E.F. Combarro, E. Montan˜ E´S, I. Dı´Az, J. Ranilla, And R. Mones , "Introducing A Family Of Linear Measures For Feature Selection In Text Categorization," Ieee Trans. Knowledge And Data Eng., Vol. 17, No. 9, Pp. 1223-1232, Sept. 2005.

[23] https://ieeexplore.ieee.org/document/571344 9 IEEE Paper regarding Systems

[24] https://en.wikipedia.org/wiki/Complaint_syste m Complaint System
[25] https://www.irjet.net/archives/V4/i4/IRJET Julia Meik, Markus Blut and Christian Brock,“Complaining Customers as Innovation Contributors”,SRII Global Conference Pp.125- 132,2014.