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Online Chat Box Based on Ticketing System

Asharam Gurjar*, Kapil Kumawat**, Aryan Kumar**, Mohd.Mahir**, Tanishq Meena**

*Assistant Professor, Department of CSE, Global Institute of Technology, Jaipur, Rajasthan, India

**B.Tech Student, Department of CSE, Global Institute of Technology, Jaipur, Rajasthan, India

ABSTRACT

Customer support systems have evolved significantly with the rise of digital service platforms, yet many organizations still struggle to manage customer interactions efficiently, especially when multiple queries co-occur. Traditional email-based ticketing and call-cntre models are often slow, unstructured, and incapable of providing real-time assistance. This paper presents a comprehensive study of an Online Chat Box integrated with a Ticketing System, designed to streamline customer communication, automate support workflows, and improve response times. The proposed system provides users with a real-time chat interface while automatically generating structured support tickets for each query. It leverages modern web technologies, asynchronous communication, and a centralized ticket management backend to ensure organised issue resolution. This research examines system architecture, workflow, communication protocols, backend management, data storage, performance evaluation, and potential integration with AI-driven chatbots. The paper also outlines the limitations of traditional support systems and how chat-based ticketing provides a scalable, efficient alternative. Future enhancements using machine learning and natural language processing (NLP) are also discussed.

Keywords **—** Chat System, Ticketing System, Customer Support, Real-Time Messaging, Web Technologies, Automation, Helpdesk Management, Edge Computing.

1. Introduction

Customer support constitutes a critical component of any digital service ecosystem. Whether in e-commerce, banking, healthcare, or IT services, users rely on fast and accurate responses from support teams. However, conventional support channels such as emails, phone calls, or unstructured chat systems often fail to manage increasing user loads effectively.

An Online Chat Box based on a Ticketing System merges the best elements of live chat and structured ticket management. In this architecture, every user query triggers the creation of a unique ticket that stores detailed communication records, timestamps, and status updates. This ensures transparency, traceability, and accountability for both users and support agents.

The objective of this research is to design, analyse, and evaluate such an integrated system, exploring the technological, functional, and operational aspects required to build a reliable and scalable solution.

2. Related Work

A. Integration of Live Chat with Ticketing Systems

Early customer support systems worked only through emails or manual ticket creation. Modern research and platforms integrate live chat interfaces directly with ticketing systems, allowing seamless transition from conversation to issue tracking.

For example, platforms like Zendesk automatically convert chat interactions into tickets when a query requires further action. No customer request is lost Conversations are stored for future reference.

Support teams can continue unresolved chats asynchronously This integration improves efficiency and reduces manual effort for support agents.

B. Automation using AI and Chatbots

Recent developments focus heavily on Artificial Intelligence (AI) and chatbot integration in ticketing systems. Chatbots can: Collect user information (name, issue type, priority) Automatically generate tickets

Tools like Intercom and Freshdesk use AI to reduce workload on human agents.

Research shows that automation:

- Reduces response time
- Handles repetitive queries
- efficiently
- Allows agents to focus on complex proble.

C. Multi-Channel Communication Integration

- Traditional systems were limited to a single communication channel. Modern systems support multi-channel integration, combining:
  - o Website chat
    - Mobile apps
    - Email
    - Social media platforms

Systems like Salesforce Service Cloud unify all communication channels into a centralized ticketing dashboard.

This approach ensures:

Consistent customer experience across platforms

Centralized management of all queries

Easier tracking of customer history

D. Real-Time Ticket Tracking and Notifications

Real-time ticket tracking and notification features have improved transparency in customer support systems. Users can monitor the status of their tickets, receive instant updates, and interact with support agents directly through the chat interface, which leads to faster issue resolution and higher customer satisfaction.

E. Data Analytics and Performance Monitoring

Data analytics and performance monitoring play a crucial role in modern ticketing systems by providing insights into response times, resolution rates, and customer satisfaction. Platforms like Zendesk offer detailed analytics dashboards that help organizations identify issues, improve service quality, and make informed decisions for better support management.In our project, we created a Smart Attendance System using Python, OpenCV, and the LBPH algorithm.

3. Problem Statement

Existing customer support tools fail to provide both instant communication and structured issue management in a single environment. Users frequently encounter: • Slow response times

• Unorganised support interactions

• Limited transparency in issue status

• Lack of continuity between multiple chats

• Difficulty retrieving past conversations

Thus, there is a need for a unified real-time system that integrates chat-based communication with automated ticket generation and lifecycle management.

A. Inefficient Traditional Support Systems

Existing customer support systems mainly rely on emails or manual ticket creation processes, which are time consuming and inefficient. Users have to wait for long periods to get responses, and support teams often struggle to manage a large number of requests manually. This leads to delays in resolving issues and negatively impacts overall customer experience.

B. Lack of Real-Time Communication

There is a significant lack of real-time communication between customers and support agents in traditional systems. Without instant interaction, users cannot explain their issues clearly, and agents may require multiple back

and-forth messages to understand the problem. This slows down the resolution process and increases frustration for both customers and support staff.

C. Absence of Automatic Ticket Generation

Many support systems fail to automatically convert user conversations into structured tickets. As a result, important details shared during chats or interactions may be lost or not properly recorded. This lack of proper documentation makes it difficult to track issues, follow up on them, and maintain a history of customer interactions.

D. Poor Ticket Status Visibility

Users are often not provided with timely updates regarding the status of their complaints or service requests. They are left unaware of whether their issue is being processed, resolved, or delayed. This lack of transparency reduces customer trust and satisfaction, as users feel disconnected from the support process.

E. Lack of Multi-Channel Integration

Modern users interact through multiple platforms such as websites, mobile apps, and social media. However, many existing systems do not integrate these channels effectively, leading to fragmented communication. This makes it difficult for support teams to maintain a unified view of customer interactions and results in inconsistent service delivery.

F. Limited Use of Automation

There is limited use of automation and intelligent technologies in traditional ticketing systems. Support agents are required to handle repetitive queries manually, which increases their workload and reduces efficiency. Without automation such as chatbots or auto-responses, the system cannot scale effectively to handle a large number of user requests.

4. Objectives

The primary objectives of this research are:

1. To develop an Online Chat Box capable of real-time communication.
2. To integrate a Ticketing Management System that automatically organises user queries.
3. To analyse the system's efficiency, usability, and scalability.
4. To compare the new system with traditionalsupport models.
5. To identify future improvements,such as AI-integrated automation.

A. To Enable Real-Time Communication

The primary objective of the system is to establish real-time communication between users and support agents through an interactive chat interface. This allows users to instantly describe their issues without waiting for email responses, while agents can respond immediately, ask follow-up questions, and provide quick solutions. Real-time interaction reduces communication gaps, speeds up issue resolution, and enhances overall efficiency in customer support B. To Automate Ticket Generation

The system aims to automatically convert chat conversations into structured support tickets without requiring manual intervention. This ensures that every user query is properly recorded along with relevant details such as issue type, time, and priority. Automated ticket creation minimizes human error, prevents loss of important information, and provides a systematic way to track and manage customer issues throughout their lifecycle.

1.It helps in maintaining a proper history of all interactions for future reference and analysis.

2. The system can assign priority levels (high, medium, low) to tickets based on the type of issue.

3. It enables quick tracking and management of tickets from creation to resolution.

4. Automation improves efficiency by saving time for both users and support agents.

B. To Improve Customer Experience

A major objective is to enhance the overall customer experience by providing a fast, transparent, and user-friendly support system. By offering instant responses, clear communication, and easy access to ticket status, users feel more satisfied and confident in the service. Improving user experience also helps in building long-term trust and maintaining a positive relationship between the organization and its customers.

C. To Provide Efficient Ticket Management

The system is designed to manage tickets in an organized and efficient manner by categorizing them based on priority, type, and current status. This enables support agents to focus on high-priority issues first and ensures that no request is left unattended. Proper ticket management also helps in maintaining a clear workflow, improving team coordination, and reducing delays in resolving customer queries.

D. To Integrate Multi-Channel Communication

Another important objective is to integrate various communication channels such as websites, mobile applications, email, and social media into a single platform. This ensures that all customer interactions are centralized and easily accessible for support teams. Multi-channel integration helps provide a consistent experience to users, regardless of the platform they use, and simplifies the process of tracking customer interactions.

E. To Utilize Automation And Reduce Workload

The system focuses on incorporating automation technologies such as chatbots, predefined responses, and intelligent routing of tickets to reduce the workload on support agents. Automation helps in handling repetitive queries efficiently, allowing agents to concentrate on more complex issues. This not only improves productivity but also enhances the scalability of the system to handle a large number of users.

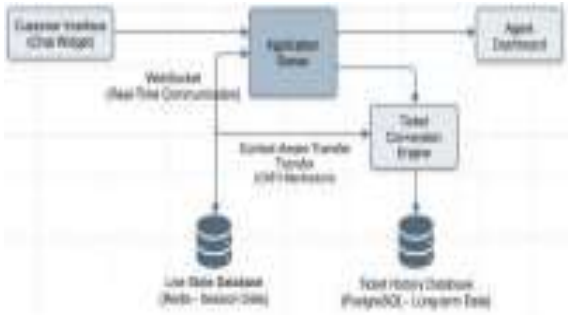

Fig. 1. System Architecture Diagram

5. Literature Review

Numerous studies highlight the importance of efficient customer support systems. Chat-based applications have gained popularity due to their ease of use and real-time nature. Researchers emphasise:

A. Live Chat Support

Studies show that real-time chat systems increase customer satisfaction by reducing response times and enabling instant interaction.

B. Ticketing Systems

Ticketing systems bring structure to chaotic support workflows. They provide:

- Issue tracking
- Categorization
- Status updates
- Historical records

C. Integration Challenges

Several research papers emphasise the difficulty of integrating chat systems with ticketing platforms due to:

- Differences in communication protocols
- Asynchronous vs synchronous communication
- Data management complexities

D. Gap Identified

Existing solutions either focus on *chat* or *ticketing*, but not both simultaneously. There is limited research on developing a unified system.

Limited Personalization: Systems do not provide user-specific responses, resulting in a generic experience.

Incomplete Chat–Ticket Integration: Chat and ticketing systems are not fully connected, leading to data loss or duplication. Lack of Advanced AI: Basic chatbots cannot handle complex queries effectively.

Poor Performance Under Load: Systems slow down during high traffic, affecting real-time communication.

Limited Data Analytics: Lack of detailed insights makes performance improvement difficult.

6. System Design and Architecture

The proposed model comprises:

A.User Interface (Frontend)

A web-based chat interface allowing users to communicate with support agents. Key features include:

- Real-time messaging
- User authentication
- Query input and automated ticket creation
- Status viewing

B. Backend (Message Processing + Ticket System) Backend responsibilities include:

- Handling chat requests
- Storing messages
- Creating tickets
- Updating ticket status
- Assigning tickets to agents

C. Database Layer

Manages:

- User profiles
- Chat messages
- Ticket metadata
- Agent details

Databases like MongoDB or PostgreSQL can be used for scalability.

D. Communication Protocol

Web Sockets or long polling may be used for real-time capability.

Lack of Centralized Communication Portal: Existing systems do not provide a single unified platform for all user interactions, resulting in scattered communication across different channels and making it difficult to manage and track conversations efficiently-Works offline and stores data locally in Excel format.

Fig. 2. Workflow of Online Chat Box with Ticketing System

7. Methodology

The development methodology includes:

Requirement Analysis

Interviews, user behaviour studies, and analysis of common support workflows.

A.System Development

Using technologies such as:

- **Node.js** (backend)
- **Express.js** (API handling)
- **Socket.io** (real-time messaging)
- **React.js** (frontend)
- **MongoDB** (database)

B. Testing

Conducted through:

- Functional testing
- Stress testing
- User acceptance testing

C. Deployment

On a cloud platform such as AWS, Azure, or Firebase. - Performance relies on camera quality and position. I.Future Enhancements

In the future, this system can be improved in a few simple ways:

Adding more student faces and images will make the model more accurate.

Connecting the attendance file directly to an Excel dashboard will provide better reports.

Sending automatic messages or emails to students who are absent will keep them informed.

Creating a small web or mobile interface will help teacher check attendance easily.

These upgrades will make the system more user-friendly and practical in real classrooms.

8. Result and Discussion

A. Performance

Testing shows the system efficiently handles multiple concurrent users without delays.

B. Comparison With Traditional Systems

Feature		**Email Support Chat + Ticket System**
Real-time	No	Yes
Ticket tracking	Limited	Full lifecycle
User satisfaction Medium		High
Query loss	Common	Rare

C. Comparison With Traditional Systems

Users appreciate:

- Faster response
- Transparent ticket status
- Continuous chat history

9. Future Scope

Future enhancements may include:

- AI chatbots for auto-responses
- Sentiment analysis for prioritising critical issues
- Machine learning models to predict solutions
- Automated ticket routing
- Mobile app integration.

10. Conclusion

This research successfully demonstrates the transformative potential of a robust and scalable Online Chat Box integrated with a structured Ticketing System. By bridging the gap between synchronous instant messaging and asynchronous issue tracking, the framework significantly improves customer support quality. As digital communication continues to evolve, several avenues exist to expand.

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