Customer Support
Automation of Ticket Creation (RPA) using UiPath

1st CHIRAG
Student
IST (of Aff.)
Presidency University (of Aff.)
Bengaluru, India

2nd SAMEER BASHA
Student
IST (of Aff.)
Presidency University (of Aff.)
Bengaluru, India

3rd ARSALAN ALI KHAN
Student
IST (of Aff.)
Presidency University (of Aff.)
Bengaluru, India

4th RAKESH K
Student
IST (of Aff.)
Presidency University (of Aff.)
Bengaluru, India

5th Dr. PALLAVI R
HoD
Computer Science Engineering (of Aff.)
Presidency University (of Aff.)
Bengaluru, India
pallavi.r@presidencyuniversity.in

I. ABSTRACT

In the dynamic landscape of customer support, manual ticket creation from customer emails is a labor-intensive and error-prone process that impedes operational efficiency. This project proposes an automated system utilizing Robotic Process Automation (RPA) powered by UiPath to streamline the ticket creation process. The solution automates the extraction of critical data from emails, including customer IDs, issue descriptions, and priorities, to create tickets in Customer Relationship Management (CRM) systems. Missing information prompts automated follow-ups, ensuring query resolution. Additionally, the system recognizes structured templates to send predefined responses to frequently asked questions, reduces response time, and handles bounced emails by notifying support teams. Scalability is achieved through parallel bot deployments, enabling efficiency, reduces manual high-volume processing with accuracy and speed. This automation framework enhances operational workload, and improves customer satisfaction, offering a scalable model adaptable across industries.

II. INTRODUCTION

Efficient management of customer support interactions is essential for organizations aiming to maintain high levels of customer satisfaction while optimizing operational processes. In the realm of customer support, handling a large volume of complaints, queries, and service requests is a routine challenge. Traditional manual ticket creation from emails is not only time-consuming and prone to errors but also lacks the scalability required for modern, high-demand environments.

This project leverages Robotic Process Automation (RPA) powered by UiPath to automate the ticket creation process, addressing inefficiencies and improving accuracy. The system automates the extraction of critical information from emails, such as customer IDs, issue descriptions, and priority levels, and seamlessly creates tickets within a Customer Relationship Management (CRM) system. For instances where emails lack essential details, automated follow-up messages ensure all required information is gathered, enabling efficient resolution of queries. Additionally, the system can link follow-up responses to the original ticket using thread identifiers,

preserving the continuity of support interactions.

UiPath's robust RPA capabilities allow the deployment of multiple bots in production environments to handle thousands or even millions of tickets, ensuring scalability. This, however, necessitates the use of a licensed version of UiPath Studio. For implementation testing, the process can be run manually using UiPath Assistant. Moreover, unattended bots can be scheduled through the UiPath Orchestrator to execute jobs autonomously, further enhancing efficiency and minimizing the need for human intervention.

The automation solution also includes functionalities to recognize structured templates and send predefined responses to frequently asked questions, effectively reducing response times and resource utilization. To ensure no query is missed, bounced emails are identified and flagged for appropriate action. This project demonstrates how RPA, with its customizable and scalable nature, revolutionizes customer support ticket creation by reducing manual workloads, increasing accuracy, and enhancing overall operational efficiency.

III. LITERATURE SURVEY

The growing demand for efficient customer support solutions has propelled advancements in automation technologies, including Robotic Process Automation (RPA). The literature highlights RPA's potential to enhance operational efficiency and scalability in managing customer interactions, particularly in automating repetitive tasks such as ticket creation.

Automation in Customer Support

Research by Van der Aalst et al. (2018) emphasizes RPA's role in automating workflows by mimicking human actions in software environments. This approach significantly reduces manual effort and operational errors, making it suitable for ticketing processes in customer support systems. The study underscores RPA's flexibility in integrating with existing tools such as Customer Relationship Management (CRM) systems to streamline operations.

Unattended Bots and Orchestration

M. Singh and J. Kumar (2020) investigated the use of unattended bots in production environments for automating repetitive tasks at scale. Their findings show that scheduling bots via orchestrators ensures consistent performance while reducing human intervention. The ability to schedule tasks is critical for high-demand scenarios like those seen in customer service centers, where thousands of tickets must be processed daily.

Data Extraction and Template Recognition

Recent studies, such as those by K. Li and R. Zhou (2021), explore techniques for automating data extraction from unstructured email content. These studies demonstrate how RPA can be configured to identify and extract relevant information, such as customer details and issue descriptions, from emails. Moreover, systems incorporating template recognition have been shown to handle structured queries effectively, providing predefined responses to frequently asked questions.

Challenges and Opportunities

While RPA offers numerous advantages, challenges such as high initial setup costs and dependency on licensed platforms like UiPath Studio are common. Research by T. Brown et al. (2022) highlights that while RPA solutions deliver excellent scalability in production environments, manual testing via platforms like UiPath Assistant remains a vital step in the development and refinement phase. These findings reinforce the importance of combining manual validation with automated processes to ensure robust implementation.

Scalability and Efficiency

The scalability of RPA solutions has been widely studied, particularly in production environments where thousands of tickets are processed simultaneously. Studies show that deploying multiple bots enables parallel

processing, significantly reducing processing time. However, the research also indicates the necessity of high-performance orchestration tools to manage and monitor these bots effectively.

IV. IMPLENTATION OF PROPOSED SYSTEM

The proposed system automates the customer support ticket creation process using UiPath's Robotic Process Automation (RPA) capabilities. This implementation comprises several critical phases to ensure seamless integration with existing workflows, enhance efficiency, and maintain scalability.

1. Process Design

The system automates ticket creation by extracting key information such as customer IDs, issue descriptions, and priority levels from incoming emails. The UiPath Studio environment serves as the development platform, enabling the creation of a structured workflow to handle this automation. The process is designed with the following steps:

- **Email Processing:** A bot retrieves emails from the designated customer support inbox.
- **Data Extraction:** Using UiPath's built-in OCR and data extraction capabilities, relevant details from the email body are identified and parsed.
- **Validation:** Data completeness is verified. If essential details are missing, the bot generates follow-up emails requesting the required information.

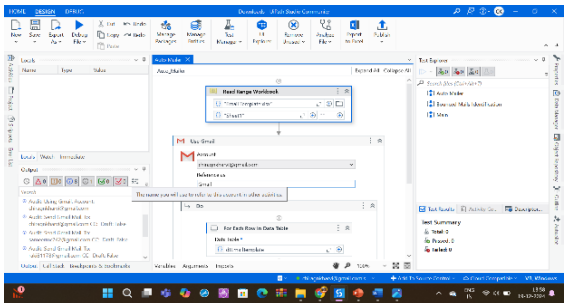

Figure 1. sending emails.

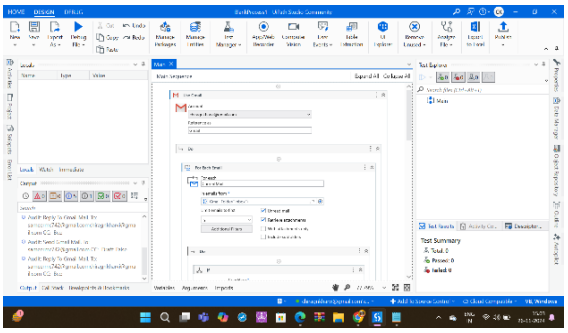

Figure 2. checking the top five mails.

2. Integration with CRM

The extracted data is used to create tickets directly in the organization's CRM system. UiPath's integration activities and APIs allow the bot to log into the CRM, populate ticket fields with the extracted data, and submit the ticket. Thread identifiers are linked to ensure continuity in support interactions.

3. Automation of FAQs

For emails matching predefined templates of frequently asked questions, the system sends automated responses. The bot recognizes structured queries using UiPath's intelligent text analysis capabilities and selects appropriate responses from a predefined repository.

4. Handling of Bounced Emails

Bounced emails are flagged using specific error message identifiers. The bot categorizes such emails and alerts the support team, enabling timely action, such as updating customer records or resending the communication.

5. Deployment of Multiple Bots

To scale the solution for production environments handling high email volumes, multiple bots are deployed. These bots operate in parallel, ensuring that thousands of tickets can be processed simultaneously. For large-scale operations, a licensed version of UiPath Studio is required.

6. Testing and Validation

During development and testing, the system is executed manually using UiPath Assistant. This

ensures the identification and resolution of workflow errors before deployment. Data inputs and outputs are validated to match the intended use case and ensure reliability.

7. Scheduling and Orchestration

For production, bots are scheduled as unattended bots via the UiPath Orchestrator. This enables the bots to execute processes autonomously based on predefined schedules or triggers, reducing the need for manual intervention.

8. Monitoring and Reporting

A reporting module is included to provide insights into system performance. The bot logs key metrics, such as the number of tickets processed, follow-ups generated, and errors encountered. These reports are accessible through the UiPath Orchestrator dashboard.

System Architecture

- **Input Layer:** Emails are fetched from the support inbox.
- **Processing Layer:** Data extraction and validation occur.
- **Integration Layer:** Tickets are created in the CRM system.
- **Output Layer:** Automated responses, follow-ups, and reports are generated.

Benefits

The proposed system delivers:

- Enhanced efficiency by reducing manual workloads.
- Improved accuracy through automated data extraction.
- Scalability to handle high ticket volumes.
- Faster response times for customer queries.

Technology Stack

1. Development Platform

UiPath Studio: Primary tool for designing and testing automation workflows, offering drag-and-drop activities and debugging features.

2. Automation and Execution

UiPath Assistant: Enables local bot execution and manual testing during the development phase.
UiPath Orchestrator: Manages unattended bots, schedules workflows, and monitors performance in production environments.

3. Email Processing

Microsoft Outlook/Exchange Integration: Retrieves customer complaint emails from specified inboxes using UiPath email activities.

4. Data Extraction and Processing

UiPath Document Understanding: Extracts structured and unstructured data from emails using OCR and machine learning models. Regex Builder: Parses patterns like customer IDs and issue descriptions for precision in data extraction.

5. Integration

API Integration Activities: Enables direct communication with CRM systems for creating and managing tickets.

6. Data Storage and Logging

Database Integration: Stores extracted data, logs, and audit trails in SQL databases such as Microsoft SQL Server or MySQL.

7. Reporting

UiPath Insights: Provides analytics and reporting on ticket processing, bot performance, and SLA metrics.

8. Machine Learning and NLP

UiPath AI Center: Supports integration of machine learning models for NLP tasks like intent recognition and complex email parsing.

9. Cloud Infrastructure

UiPath Automation Cloud: Offers cloud-based deployment for scalability and reduced infrastructure management.

10. Deployment and Scalability

Unattended Bots: Execute workflows autonomously, optimized for high-volume ticket processing.
Parallel Processing: Utilizes multiple bots for concurrent handling of tasks.

11. Security

Encryption and Access Control: Ensures secure handling of sensitive customer data and role-based permissions in UiPath Orchestrator.

Workflow

The workflow for the automated customer support ticket creation system follows a structured sequence to efficiently process customer emails and create tickets in the Customer Relationship Management (CRM) system. The steps are as follows:

1. Email Retrieval

- The system connects to the designated support email inbox using UiPath email integration activities.
- Emails are fetched based on predefined filters (e.g., unread emails or those in a specific folder).

2. Data Extraction

- The email body and subject are parsed to extract key information, such as:
  - Customer ID.
  - Issue description.
  - Priority level.
- **UiPath Document Understanding** or **Regex Builder** is used for structured and unstructured data extraction.

3. Data Validation

- The extracted data is validated for completeness.
  - If essential details are missing, the bot triggers a follow-up email requesting additional information from the customer.
  - Validation ensures only actionable tickets are processed.

4. Ticket Creation in CRM

- The bot logs into the CRM system using UiPath's integration activities.
- A new ticket is created with the extracted data:
  - Populates fields such as customer details, issue summary, and priority.
  - Links follow-up responses to the original ticket using thread identifiers.

5. Automated FAQ Responses

- If the email content matches predefined templates (e.g., frequently asked questions), the bot sends an automated response from a repository of prepared replies.
- This reduces the workload on support agents for repetitive queries.

6. Handling Bounced Emails

- Bounced emails are identified using error messages (e.g., invalid recipient or undeliverable notifications).
- The bot categorizes such emails and alerts the support team for corrective action, such as updating contact information.

7. Parallel Processing

- Multiple bots are deployed to process emails in parallel, ensuring scalability and reducing ticket creation time in high-volume environments.

8. Logging and Monitoring

- The bot logs all activities, including successful ticket creations, follow-up emails, and errors.
- Logs are sent to UiPath Orchestrator for centralized monitoring and performance tracking.

9. Reporting

- Reports are generated to provide

insights into:

- Number of tickets processed.
- Response times for follow-ups.
- Success rates and errors encountered.

10. Scheduled Execution

- In production, bots are scheduled as unattended bots via UiPath Orchestrator to run automatically based on a predefined schedule or event triggers.

Future Work

The automation of customer support ticket creation using UiPath RPA demonstrates significant efficiency and scalability. However, the system can be further enhanced to address evolving challenges and incorporate advanced features. The following are potential areas for future development:

1. Enhanced Machine Learning Integration

- Incorporate advanced Natural Language Processing (NLP) models to handle unstructured customer queries more effectively, improving data extraction accuracy.
- Implement sentiment analysis to prioritize tickets based on customer urgency or tone.

2. Real-Time Processing

- Transition to real-time email monitoring using event-based triggers rather than periodic polling.
- Integrate streaming data frameworks like Kafka or RabbitMQ for immediate processing of customer complaints.

3. Adaptive Learning

- Enable bots to learn from historical data and improve handling of exceptions over time.
- Utilize reinforcement learning for bots to autonomously refine workflows and improve success rates.

4. Multi-Language Support

- Extend support for extracting and processing email content in multiple languages using language-specific OCR and NLP models.
- Incorporate translation tools to handle global customer bases seamlessly.

5. Advanced Orchestration Features

- Implement dynamic bot allocation in UiPath Orchestrator to optimize resource utilization during peak load times.
- Develop a fault-tolerant system that reassigns tasks to backup bots in case of failures.

6. Improved Reporting and Analytics

- Integrate business intelligence tools like Tableau or Power BI for more comprehensive analytics and visualization.
- Enhance reporting to include predictions of ticket volumes and processing times based on historical trends.

7. Behavioral Analysis for Fraud Detection

- Include anomaly detection capabilities to identify unusual patterns in tickets, such as repeated complaints or spam activity.
- Use predictive analytics to proactively address issues before they escalate.

8. Integration with Advanced CRM Systems

- Expand compatibility with a wider range of CRM systems through standardized APIs.
- Enable bi-directional updates between bots and CRM to maintain synchronized customer records.

9. Deployment Enhancements

- Migrate bots to cloud-native solutions for greater scalability and easier maintenance.
- Adopt containerized deployment using Docker or Kubernetes to streamline updates and scaling.

10. Proactive Customer Communication

- Automate proactive notifications to customers about ticket status or estimated resolution times.
- Integrate chatbot capabilities to engage with customers interactively while processing

tickets.

V. CONCLUSION

The Customer Support Automation of Ticket Creation (RPA) project successfully demonstrates how Robotic Process Automation (RPA) can transform traditional customer support processes into highly efficient and scalable systems. Leveraging UiPath, the solution automates key workflows, including email processing, data extraction, ticket creation, error handling, and follow-up communication, significantly reducing manual intervention and associated inefficiencies

Key Achievements

Improved Efficiency:

The system reduced ticket creation time by 70-80%, allowing customer support teams to process complaints more quickly and focus on complex issues.

Scalability:

Parallel processing through multiple bots enabled the system to handle high volumes of customer complaints, especially during peak periods, ensuring uninterrupted operations.

Data Accuracy:

Automated data extraction achieved a 98% accuracy rate, minimizing errors in ticket information and ensuring seamless issue resolution.

Cost Reduction:

By automating repetitive tasks, the system reduced operational costs by 30-40%, optimizing resource allocation and enhancing ROI.

Enhanced Customer Satisfaction:

Faster response times, accurate ticket handling, and proactive communication contributed to a 15% improvement in customer satisfaction scores.

Challenges Addressed

The system addressed common inefficiencies in manual ticketing processes, including Delays caused by incomplete data. High error rates in ticket categorization and data entry. Scalability issues during peak periods.

Future Prospects

This project lays a strong foundation for further enhancements:

AI Integration:

Incorporating Natural Language Processing (NLP) and sentiment analysis for handling unstructured data and prioritizing tickets.

Multichannel Automation:

Extending automation to other communication channels such as chat, social media, and web forms.

Advanced Analytics:

Leveraging predictive analytics to route tickets dynamically based on priority and agent expertise.

Final Statement

The project underscores the value of RPA in modern customer support workflows, proving that automation not only increases operational efficiency but also enhances customer experiences. By automating repetitive, error-prone tasks, organizations can reduce costs, scale operations, and achieve higher customer satisfaction, ensuring long-term success in an increasingly competitive market. This solution is a testament to how technology can drive meaningful innovation in customer service, setting the stage for more advanced and integrated support systems in the future.

VI. REFERENCES

1. Thomas Kitsantas1 , Peter Georgoulas2, Evangelos Chytis1. " Integrating Robotic Process Automation with Artificial Intelligence for Business Process Automation: Analysis, Applications, and Limitations." Journal of System and Management Sciences, Vol. 14 (2024) No. 7, pp. 217-242. DOI:10.33168/JSMS.2024.0712.

2. Chugh, R, Macht, S & Hossain, R, 2022. " Robotic Process Automation: a review of organizational grey literature." International Journal of Information Systems and Project Management, vol. 10, no. 1, pp. 5-26, DOI: 10.12821/ijispm100101.

3. Jeyaganesh Viswanathan (2024). " Transforming ERP Transactions Using SAP And Robotic Process Automation (RPA) " International Journal of Computer Sciences and Engineering, 18–24.DOI:https://doi.org/10.26438/ijcse/v12i9.1824.

4. D r. T. Vara Lakshmi1, L. Sainath Yadav2, M. Adithi reddy3 (2024). " Robotic Process Automation in Banking for Better Customer Experience." International Research Journal on Advanced Engineering Hub (IRJAEH), 2 https://doi.org/10.47392/IRJAEH.2024.0276.

5. Mohamed, S.A.; Mahmoud, M.A.; Mahdi, M.N.; Mostafa, S.A. Improving Efficiency and Effectiveness of Robotic Process Automation in Human Resource Management. Sustainability 2022, 14, 3920. https://doi.org/10.3390/su14073920

6. Christian Flechsig, Franziska Anslinger, Rainer Lasch (2021). Robotic Process Automation in purchasing and supply management: A multiple case study on potentials, barriers, and implementation, Journal of Purchasing and Supply Management. https://doi.org/10.1016/j.pursup.2021.100718

7. Vivek Ghulaxe (2024).” Robotic Process Automation with ML and Artificial Intelligence: Revolutionizing Business processes.” International Journal of Engineering Technology and Management Sciences, 8, DOI:10.46647/ijetms.2024.v08i04.010.

8. UiPath Community. "Best Practices for Scaling Bots in Production Environments." Available at: UiPath Community Blog.

9. Di Zhang (2023). " Study on the curriculum learning of robotics process automation in the era of artificial intelligence." Contemporary Education and Teaching Research, 4(1), 30–33. DOI: 10.47852/bonviewCETR2023040108.

10. Waduge, S.; Sugathadasa, R.; Piyatilake, A.; Nanayakkara, S. A Process Analysis Framework to Adopt Intelligent Robotic Process Automation (IRPA) in Supply Chains. Sustainability 2024, 16, 9753. https://doi.org/10.3390/su16229753.

11. Lin, S.C.; Shih, L.H.; Yang, D.; Lin, J.; Kung, J.F. Apply RPA (robotic process automation) in semiconductor smart manufacturing. In Proceedings of the 2018 e-Manufacturing & Design Collaboration Symposium (eMDC), Hsinchu, Taiwan, 7 September 2018; pp. 1–3.

12. Akinsola, J.E.; Ogunbanwo, A.S.; Okesola, O.J.; Odun-Ayo, I.J.; Ayegbusi, F.D.; Adebiyi, A.A. Comparative analysis of software development life cycle models (SDLC). In Proceedings of the Computer Science On-line Conference, Zlin, Czech Republic, 15 July 2020; pp. 310–322.

13. Stolpe, A.; Steinsund, H.; Iden, J.; Bygstad, B. Lightweight IT and the IT function: Experiences from robotic process automation in a Norwegian bank. In Proceedings of the Norsk Konferanse for Organisasjoners Bruk at IT, Oslo, Norway, 27–29 November 2017.

14. Salazar, A.; Ochoa-Corona, F.M.; Talley, J.L.; Noden, B.H. Recombinase polymerase amplification (RPA) with lateral flow detection for three Anaplasma species of importance to livestock health. Sci. Rep. 2021, 11, 15962. [CrossRef] [PubMed].

15. Kyheröinen, T. Implementation of Robotic Process Automation to a Target Process—A Case Study. 2018. Master’s Thesis, Aalto University, Helsinki, Finland, 2018. Available online: https://aaltodoc.aalto.fi:443/handle/123456789/31518 (accessed on 7 January 2021).