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ARTIFICIAL INTELLIGENCE IN CUSTOMER SERVICE: A COMPREHENSIVE STUDY OF PEGA CHATBOTS USING DIGITAL MESSAGING

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Abstract

In the modern digital landscape, customer service has evolved significantly with the advent of intelligent automation. Chatbots, powered by artificial intelligence (AI), are at the forefront of this transformation, providing efficient and effective customer interactions. PEGA, a leading software platform for customer engagement and operational excellence, incorporates chatbot functionalities through its digital messaging capabilities. This paper examines the architecture, benefits, and challenges of implementing a PEGA chatbot.

Keywords –Customer Service, Digital Messaging, PEGA, Chatbots, Artificial Intelligence, Customer Satisfaction, Operational Efficiency

I. INTRODUCTION

In the contemporary landscape of customer service, the integration of digital messaging platforms has emerged as a pivotal innovation, transforming how businesses engage with their customers. PEGA Digital Messaging, a robust solution offered by PEGA Systems, stands at the forefront of this transformation. Leveraging advanced artificial intelligence and natural language processing, PEGA Digital Messaging enables organizations to deploy intelligent chatbots that provide instant, efficient, and personalized customer interactions across multiple digital channels, including web chat, mobile apps, and social media. This integration not only enhances the customer experience by ensuring consistent and timely responses but also optimizes operational efficiency by automating routine inquiries and tasks. As businesses increasingly prioritize digital-first strategies, the implementation of PEGA Digital Messaging presents a significant opportunity to redefine customer engagement and drive sustainable growth.

a) PEGA Digital Messaging: An Overview

PEGA Digital messaging encompasses web messaging (embedded chat on websites) and various private and public channels as depicted in Figure 1. Supported private channels include Apple Business Chat, Facebook Messenger, SMS/MMS (via Twilio), Twitter direct messages, and WhatsApp, while public channels cover Facebook public posts and Twitter public tweets. Web Messaging offers synchronous, real-time communication, while private and public channels support both synchronous and asynchronous interactions.

Creating a single digital messaging channel allows users to interact with applications through multiple social messaging platforms via PEGA Intelligent Virtual Assistant (IVA). This channel is easy to set up and enhances user experience by simplifying the maintenance of conversational capabilities. By defining one PEGA IVA for digital messaging, businesses can expose essential services through chatbots on various platforms, improving user engagement. For instance, a travel agency can enable customers to book flights instantly via chatbots on multiple messaging platforms like Apple Business Chat and Facebook Messenger, thereby enhancing the overall user experience.[1]

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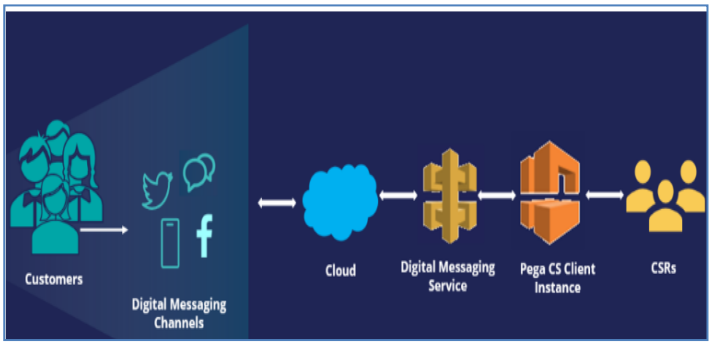

Figure 1: PEGA Digital Messaging Overview[1]

b) Introduction to PEGA Chatbot

PEGA Customer Servicechatbots serve as the primary interface for all text-based customer interactions.

These chatbots enable customers to input queries or service requests via a chat interface accessible from a customer-facing web page, subsequently receiving automated responses and guidance. During a live chat session, customers engage directly with a customer service agent. Conversely, in a chatbot session, the chatbot processes customer requests by guiding them through a structured set of questions, gathering necessary information, and executing the service request autonomously. This automation offloads routine tasks from customer service agents, allowing them to focus on more complex and high-priority issues. Figure 2 below depicts the working of an AI chatbot as described above.

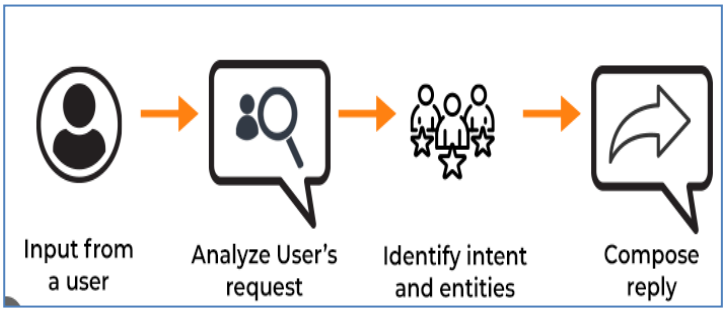

Figure 2: How AI Chatbot Works[2]

c) Research Objective/Scope

This research aims to provide a comprehensive study of the application of artificial intelligence (AI) in customer service through PEGA chatbots using digital messaging platforms. It will cover the technical architecture, implementation strategies, and benefits for deploying PEGA chatbots. Additionally, the research will include case studies to analyze the impact on customer service efficiency and user satisfaction.

II. ARCHITECTURAL FRAMEWORK

The PEGA chatbot utilizes a layered architecture comprising the following components:[3]

a) Pega Customer Relationship Management (CRM) - Pega's Customer Relationship Management (CRM) suite is a platform that helps businesses manage customer relationships. It includes products like Pega Customer Service, Pega Sales Automation, and Pega Customer Decision Hub. The suite aims to be agile, allowing business users to drive change while minimizing IT requirements

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b) Your Pega Customer Service application (Implementation Layer) - In the Implementation layer Customer Service application, contact center users, including customer service representatives (CSRs) and contact center managers, process service cases and receive role-based access to various features within the interaction portal, a component of the PEGA Customer Service application. Customers develop their Customer Service application by configuring case types, the interaction portal, and other elements to meet their business requirements, ensuring that the custom CS application is built on the foundational PEGA CS application.

c) Self-Service applications - In a Customer Service Self-Service (CS Self-Service) application, customers interact with a chatbot on the website to process service cases using a conversational user interface (UI) based on a question-and-answer format. Both the Interaction Portal in the Customer Service application and the Self-Service application support the same service cases, differing mainly in their presentation. The Self-Service application utilizes a simplified UI that exclusively features questions and answers.

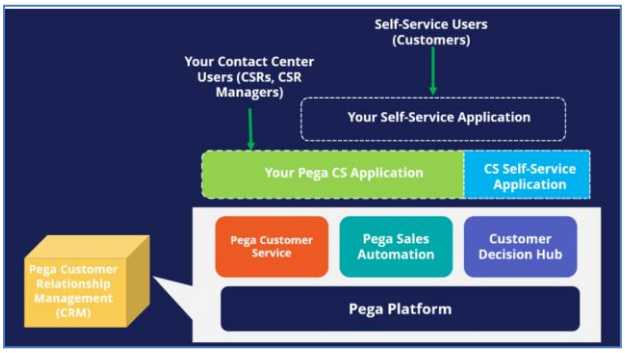

Figure 3: PEGA self Service Application Architecture Diagram[4]

Figure 3 above depicts the layered architecture of a PEGA Serf Service application built on PEGA Platform and its three out of the box frameworks – Pega Customer service, Pega Sales Automation and Customer Decision hub. The customer's Serf Service application is built on the PEGA OOTB Serf Service Application and the customized Customer Service application.

III. CASE STUDY

a) Problem Statement

The customer aims to decrease the volume of incoming calls and emails directed to the customer service team. The current application supports over 25k – 30k users with varying roles. Presently, the Customer Service Representative (CSR) team processes more than 2k – 4k service requests daily, including general inquiries, complaints, and user/contact management, received via email and phone. To address this, the customer intends to implement a new self-service channel in the form of a chatbot, which will help reduce wait times and enhance the availability of customer service.

b) Solution Approach

The PEGA "Digital Messaging "channel and User Interfaces facilitates the exposure of essential business services to users through a chatbot across multiple messaging platforms by configuring a single PEGA Intelligent Virtual Assistant™ (IVA). Custom IVA responses can be tailored to meet the specific business requirements of any organization and leverage natural language processing (NLP), decisioning, and text analytics capabilities to extract user intents. Chatbot messaging platforms such as Apple Business Chat, Facebook Messenger, MMS/SMS (Twilio), Twitter, WhatsApp Messenger, and Web Messaging can be configured within the PEGA application.

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c) Technical Solution & Execution

- A new ruleset is generated and incorporated into the newly developed self-service application. This application is expected to encompass all self-service rulesets present in the out-of-the-box (OOTB) self-service application.
- The security tab of the application is updated with the Manager ID and Key as shown in the Figure 4 below.

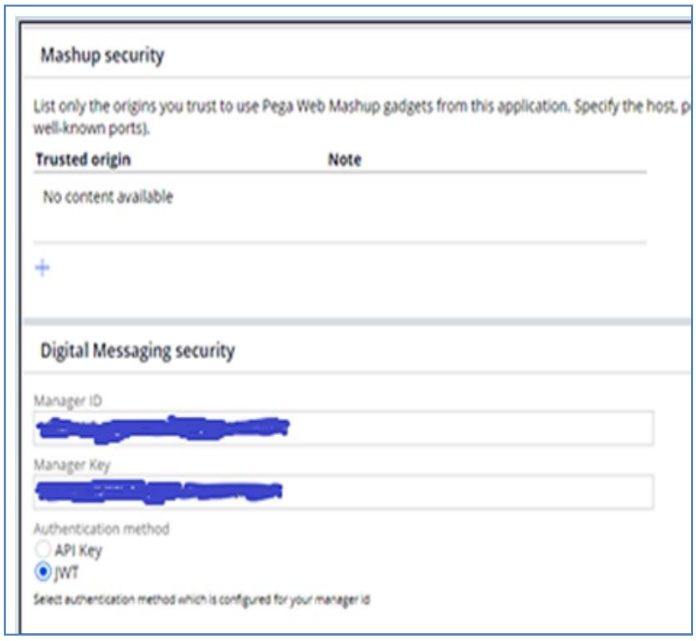

Figure 4: Application Security Tab

- A couple of service case types, as requested by the business for automation, is included in the "Cases & Data" tab of the application to ensure availability within the create case option of the digital messaging channel.
- Following the guidelines outlined in the article “Template operator for IVA channel”, a template operator is created and subsequently added to the Channel tab of the digital messaging setup. Additionally, the application URL (up to prweb) has been established as the base URL.
- A new developer access group is created and assigned to the newly developed application. Upon logging in with an operator ID, the "New Bot Agent" interface can be accessed via Application > Channels and Interfaces navigation. Herein, the channel interface name and description are entered, with the option to remove Conversation flows being available if necessary. Figure 5 below shows the sample UI of “Now Bot Agent” interface.

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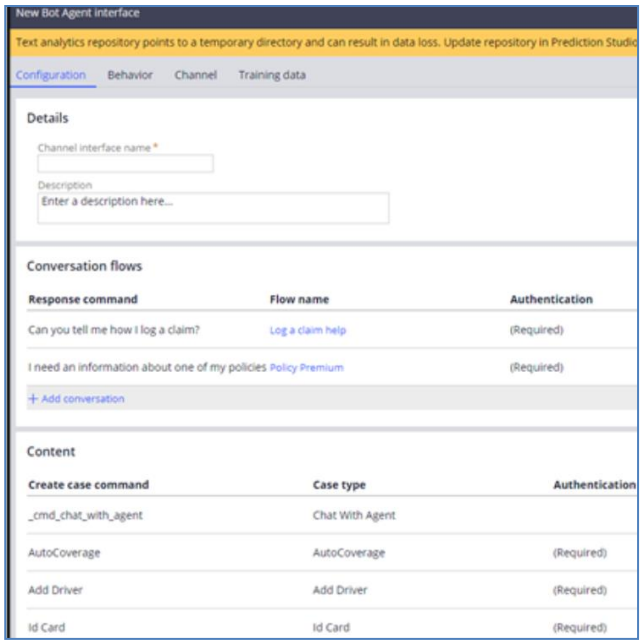

Figure 5 : New Bot Agent Interface

• Two service case types were configured in the create case command. Figure 6 below shows the General Inquiry Case type created for the purpose of this research.

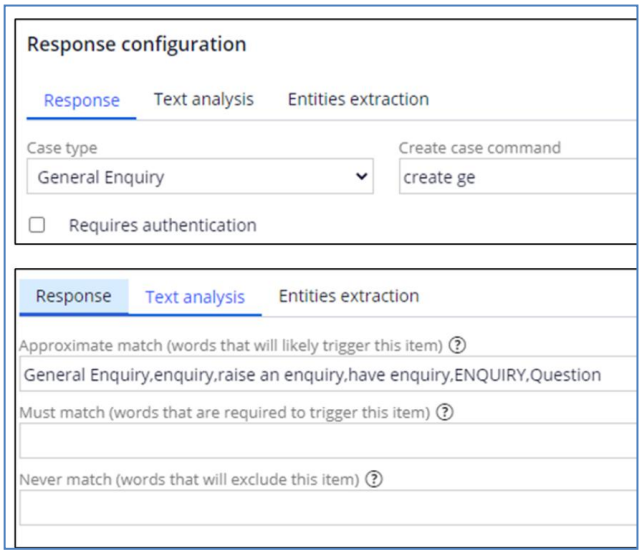

Figure 6: General Inquiry Case Type

• The "chat with agent" case type was added to facilitate the escalation to live CSR. Figure 7 below shows the "chat with agent" case type created for the purpose of this research.

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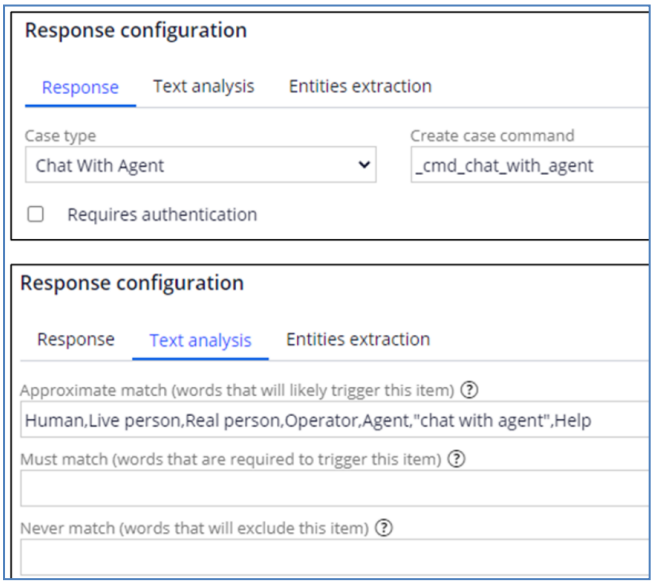

Figure 7 : Chat with Agent Case Type

- The web chatbot is configured by adding the connection details in the "Channels" tab

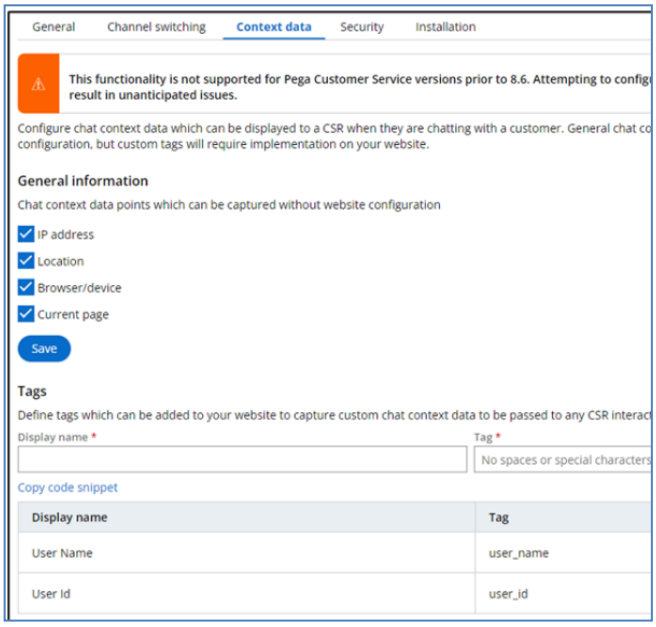

Figure 8: Configuring Context Details in a Chatbot

- The context data is configured to display additional details to the CSR when they will interact with the customer through the chatbot in the interaction portal as shown in the above screenshot, Figure 8.
- Now go to the "Installation" tab and copy the script as this needs to be added in the web page where the chatbot icon will appear.
- In this application, the end-user logs into PEGA where the chatbot is available. To facilitate this, the script for the "Installation" tab is copied and added to the "user work form" rule. To pass custom tags (such as username and ID) to the chatbot, the code snippet generated

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in the context data tab is also added to the "user work form". This modification to the "user work form" is implemented within the new rule set created for the self-service application. Made sure the CSR and end-user both are pointing to the new self-service application to make use of this chatbot.

- A queue (workbasket) and skills are created in dev studio and moved to the app studio to configure the chat queue.
- The queue and skills are added to CSR operator profile.

d) End User Chatbot

Entering any approximate comments for general enquiry, the bot will automatically detect it and start the flow for respective case type.

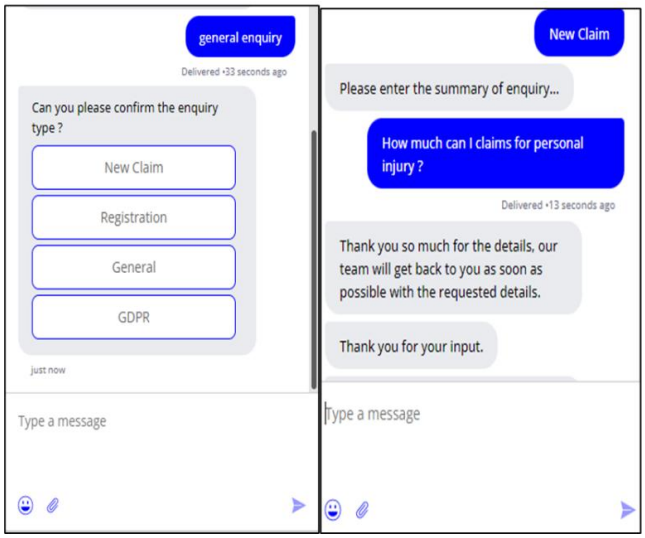

Figure 9 : End User Chatbot

The above figure displays how the end user will view the chatbot once the configuration is complete. The figure on the left shows the General Inquiry case type and how user can select from a list of preconfigured options. The figure on the right shows how the flow of question and answer will work in real time after the user selects one of the options, in this case "New Claim".

IV. BENEFITS OF PEGA CHATBOT

Efficiency in Handling Routine Service Cases -A PEGA chatbot is highly effective in managing service cases that follow a consistent pattern and do not typically require agent intervention. Examples include requests for current account balance, previous month balance, next payment due, or account statements.

Automation of Multi-Step Processes -The chatbot can be configured to handle complex, multi-step processes such as opening an account, changing an address, and making payments, streamlining these procedures for users.

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24/7 Service Availability - By automating routine and multi-step case types, organizations can provide services that are always available, enhancing customer satisfaction and operational efficiency.

Seamless Escalation and Continuity -If the chatbot is unable to complete a case, users can escalate the interaction to an appropriate queue. An agent can then access the transcript of the partially completed case and seamlessly continue the interaction with the customer, ensuring continuity and a smooth customer experience.

V. CONCLUSION

- PEGA Chatbots presents a promising avenue for enhancing customer service operations.
- While there are challenges to address, the benefits in terms of efficiency, availability, and consistency are substantial.
- Future research could focus on advanced AI techniques to further improve chatbot capabilities.
- Exploration of user adoption strategies is also recommended.
- Future Trends:
- AI advancements, particularly in the context of PEGA chatbots using digital messaging, are set to enhance customer interaction efficiency and personalization.
- Improvements in natural language processing (NLP) and machine learning (ML) will enable chatbots to understand and respond to customer inquiries with greater accuracy and empathy.
- Predictive analytics integration will allow chatbots to anticipate customer needs and offer proactive solutions.
- The rise of omnichannel platforms will ensure seamless interactions across various digital messaging channels, including social media, mobile apps, and web interfaces.
- As AI technology continues to evolve, chatbots will be able to handle increasingly complex service requests, reducing reliance on human agents for routine tasks.
- Ethical considerations and data privacy will become more prominent, driving the development of transparent and secure AI systems.
- These trends indicate a future where AI-driven chatbots play a central role in delivering superior customer service experiences.

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