

Customer Service AI Chatbot



Payactiv Advisor: Karthik Mokashi
Santa Clara University Advisor: Gangshu Cai

June 2024

Aitana Hierro
Samhita Komandur Sreenivasa
Sneha Vinod
Wanqing Wang

Table of Contents:

1. [Executive Summary](#)
2. [Introduction](#)
3. [Project scope and objectives](#)
4. [Work plan and timeline](#)
5. [Key project findings / deliverables](#)
6. [Benefits to the sponsoring company](#)
7. [Next steps for ongoing project success](#)
8. [Conclusion](#)
9. [Appendix: Flowchart](#)

Executive Summary

Payactiv, Inc., a certified B Corp and leader in employee financial wellness services, aims to leverage AI to develop a customer success chatbot using AWS tools, specifically Amazon Bedrock Agents, to streamline the account creation process. This chatbot will assist the Customer Success team in managing increasing customer volumes by providing immediate, accurate responses, thus improving customer experience, efficiency, and satisfaction. The project's Proof of Concept (POC) demonstrated the feasibility and effectiveness of this generative AI technology, achieving a 80% success rate in account creation. Key components include a web interface, backend APIs, and an OpenAPI schema. The chatbot can handle various scenarios, such as account creation and information verification, while offering benefits like cost savings, scalability, and 24/7 availability. Next steps involve backend integration, expanding use cases, implementing a knowledge base, and continuous improvement to maintain Payactiv's leadership in the fintech industry.

Introduction

Payactiv, Inc is a certified B Corp and the leader in employee financial wellness services. With Payactiv, Employers offer instant and timely access to earned but unpaid wages to their employees, an award-winning, socially responsible service proven to improve employee financial wellness, retention, recruitment, and engagement. Financial services include, earned wage access, smart budgeting and savings, financial counseling, financial literacy, and discounts. Payactiv serves thousands of businesses in retail, senior care, healthcare, restaurants, manufacturing, call centers, and other service industries. Payactiv is based in Silicon Valley (San Jose, CA).

PayActiv wants to leverage the use of AI to create a customer success chatbot which can help the Customer Success team to deal with a massive volume of new customers.

Project scope and objectives

This report outlines the development of a generative AI chatbot for PayActiv, leveraging AWS tools, specifically Amazon Bedrock Agents, to effectively guide users through the account creation process.

Conducting a Proof of Concept (POC) investigation, we assessed the feasibility and effectiveness of implementing generative AI technology within PayActiv's customer support system, selecting the use case of creating an account for its concreteness and relevance.

The chatbot was designed with scalability in mind, enabling future integration with PayActiv's customer-facing platform for handling account creation.

POC Objectives:

- ☐ Deliver a functioning chatbot product that can guide users through the account creation process.
- ☐ Achieve a success rate of 80% in the account creation process.
- ☐ Present a demo of the product to PayActiv's higher management to secure further funding for the project.

Work plan and timeline

Month	February		March		April		May		June
Week	1-2	3-4	1-2	3-4	1-2	3-4	1-2	3-4	1-2
Meeting the team									
Gen AI & AWS Bedrock Research									
AWS Training									
Flowchart Design									
Create API Schema									
Create Middleware Lambda									
Create Backend Lambda									
Create API Endpoints									
Integrate Mock-Data									
Test & Adjust									
Touchpoint in person with AWS									
Test & Adjust									

Demo for Customer Success team									
Create Interface									
Create written report									
Demo & Presentation									

Key project findings/ deliverables

The key deliverable from the team is a chatbot designed to streamline the account creation process for users. The chatbot is powered by AWS Bedrock Generative AI tool and developed based on the Anthropic Claude 2.0 large language model (LLM).

The key components of this chatbot includes:

- A web user interface developed with Streamlit and hosted on AWS Cloud9
- Backend APIs implemented in Python
- An OpenAPI schema that details the purpose and functionality of each API in JSON format
- A instruction listing steps the agent needs to perform
- A flowchart to demonstrate the flow of account creation

Besides the above components, the team also created mock data with AWS DynamoDB for testing purposes and provided documents on various use cases and explanations of the chatbot development process.

The chatbot guides users through the entire account creation process, prompting them for necessary information and providing immediate feedback on the information's validity in a conversational format. The agent is able to understand natural languages and extract information from user input for further process. It is executed strictly based on OpenAPI schema and instruction provided. There are 5 scenarios that this agent is able to help automate:

- It will help the first time user to create a regular account or direct account based if the user's employer offers Payactiv service.
- It will inform the user the time its employer starts to provide Payactiv service.
- It will identify if the user already has an account.
- It will verify the user provided information with census data in Payactiv database and create an account for the user if verification succeeds.
- It will transfer the user to a human agent if the information verification fails.

Benefits to the sponsoring company

1. **Optimized Customer Experience:** The AI chatbot significantly improves customer experience by providing immediate, accurate responses to inquiries, ensuring customers receive the help they need without delays. This leads to higher customer satisfaction and retention rates. The chat agent also results in zero wait time for routine tasks for users, and takes actions on behalf of the user. It also allows for immediate realtime intervention at any friction points in the app resulting in a better customer experience.

2. **Increased Efficiency:** By automating routine customer interactions, the chatbot reduces the workload on PayActiv's customer service team. This allows human agents to focus on more complex issues, improving overall efficiency and productivity. By delegating mundane CS tasks to an automated agent, human agents can focus on high value, personalized services to improve end user experience.
3. **Cost Savings:** Implementing the AI chatbot can lead to substantial cost savings. By handling a significant portion of customer interactions, the need for extensive human customer service resources is reduced, leading to lower operational costs. Lower operational costs are realized in two ways, in reduced hiring for agents, and in training and attrition costs.
4. **Scalability:** The chatbot is designed with scalability in mind. As PayActiv grows, the chatbot can handle increasing volumes of customer interactions without a proportional increase in customer service staffing costs.
5. **Data Insights:** The AI chatbot collects valuable data on customer interactions, providing insights into common customer issues and queries. This data can be used to improve products and services, as well as to refine and optimize the chatbot's responses. Depending on the needs and shortcomings of stock models, the data collected can also guide the fine tuning of AI models to better suit the company's evolving business needs.
6. **Consistency and Accuracy:** Unlike human agents, the chatbot provides consistent and accurate responses to customer inquiries, reducing the chances of errors and misinformation. This consistency enhances the credibility and reliability of PayActiv's customer support and makes for a consistent customer experience at each interaction.
7. **Waiting Time Reduction:** While our current customer service operates 24/7, our new AI chatbot further enhances this by providing instant responses at any time. This reduces wait times and ensures customers receive immediate support, improving overall customer satisfaction and convenience.
8. **Competitive Advantage:** By adopting advanced AI technology, PayActiv positions itself as an innovative leader in the fintech industry. This can enhance the company's reputation and attract tech-savvy customers looking for modern solutions
9. **Enhanced Security:** The chatbot can be programmed to adhere to strict security protocols, ensuring that sensitive customer information is handled securely and in compliance with data protection regulations, thereby mitigating the risk of data breaches.

Next Steps for Ongoing Project Success

The initial scope of our project was focused on one use case: helping customers with account creation. Listed below are the key steps we recommend to ensure the successful implementation of a Gen AI chatbot for Payactiv.

1. **Backend Integration**

- a. The Proof of Concept (POC) utilized mocked-up backend databases through AWS DynamoDB. For the chatbot to access real-time data, it will be necessary to integrate Payactiv's databases with the backend and middleware lambda functions that have been created during this project.

2. Expansion in Use Cases

- a. As we have proved that a chatbot can be implemented to address account creation, there are numerous other uses that the chatbot can be trained to handle:
 - i. Assisting customers in accessing their earned wages
 - ii. Helping customers update their work hours
 - iii. Addressing customer issues in accessing their wages
 - iv. etc.

3. Implement a Knowledge Base

- a. As Payactiv is a Fintech company, customers may have questions regarding the services they provide and how to utilize them. Through AWS, a Knowledge Base can be integrated to provide the chatbot with relevant information. This will enable the chatbot to go beyond its current capabilities and reduce the load on the customer service team. Information added to the knowledge base can include:
 - i. Information about Payactiv's offering
 - ii. Common Earned Wage Access (EWA) terminology
 - iii. Frequently asked questions
 - iv. etc.

4. Continuous Improvement

- a. In order for the chatbot to continuously be successful in assisting customers, it will be necessary to focus on its improvement as Payactiv continues to grow.
 - i. Regularly test the chatbot's performance to identify any pertinent issues
 - ii. Update the Knowledge Base consistently to include new services, updates, information, etc.
 - iii. Maintain a record of the chatbot's success rate with customers to identify areas of improvement
 - iv. Continuously integrate new uses cases as needed

Conclusion

In conclusion, the development and implementation of a generative AI chatbot for Payactiv marks a significant advancement in enhancing customer service efficiency and satisfaction. By leveraging AWS Bedrock Agents, the chatbot streamlines the account creation process, providing immediate, accurate support and reducing the workload on human agents. The successful Proof of Concept demonstrates the chatbot's capability to handle various user scenarios for the account creation use case, offering benefits such as cost savings, scalability, and 24/7 availability. As Payactiv continues to integrate and expand this technology, it will solidify its leadership in the fintech industry, providing innovative solutions that enhance both customer experience and operational efficiency.

Appendix: Flowchart

