

White Paper

# Testing ChatBot Applications





## Abstract

Chatbot applications have witnessed significant growth in recent years, transforming the way businesses and individuals interact with technology. Nowadays, chatbots are common in almost all the websites e.g., banking, healthcare, and online applications for consumers . Most of the users are also showing interest in using chatbots to find their order status, requirement confirmation details, ticket confirmations, review of the products and many more also sharing some personal details like name, mobile number, and gender without having second thought to get the appropriate outcome from the chatbot of the vendor.

## Key Takeaways

### 01

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Test the chatbot's functionality, security, availability testing types thoroughly

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Test the chatbot's integration with external systems for E2E testing

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Test the chatbot's user experience, tone

### 02

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Testing the chatbot's performance under different scenarios

### 04

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Test the chatbot's ability to handle errors and exceptions gracefully

## Introduction

Chatbots are like a standard application for development and testing using methodologies to deliver as per the customer requirement also most of the organizations are developing chatbots for internal use.

Development of chatbots includes AI techniques to respond to user queries, machine learning to generate questions and share the data, also understand the user behavior and responses to generate next level of questions, also user can communicate with his/her own English language then chatbot should be capable in understand using natural language processing (NLP).

Now most of the chatbots are using a set of rules (rule based) and updating the code frequently based on the user feedback but now a days most of the chatbots are developing using AI techniques and training them initial stage then giving a capability to learn from the user interactions, transactions performed in the past and respond. Testing is a key activity in IT to validate the responses, functionalities, user interactions, responsiveness, and how secured in storing the details of customers/users.

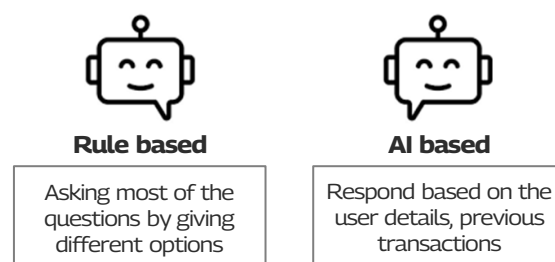


Figure 1 - Types of chatbots

## Key test types are addressed to verify and validate chatbot

Functional testing to test all the features of chatbot including user experience. Key aspect is to test the messages and questions displayed by the chatbot for the user requests to address and the responses should be prompt and less time to display. Users will share their personal information based on the query, chatbot program should handle and should not share with other users and chatbots should available 24/7 with the same performance and response always.

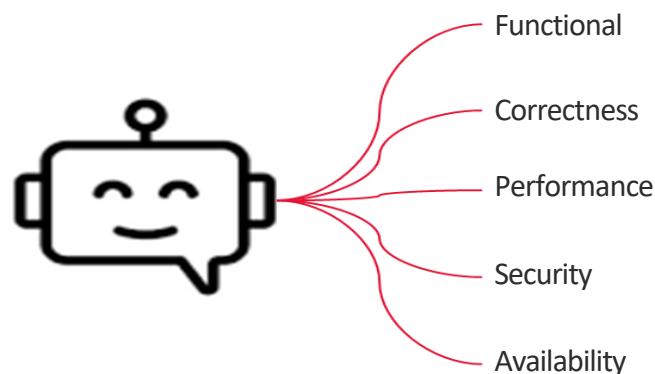


Figure 2 - Testing types used

## Testing Approach

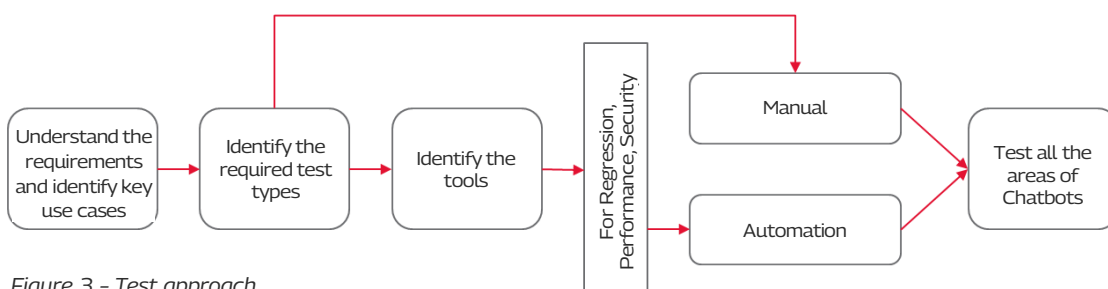


Figure 3 - Test approach

# Key Areas in Testing of Chatbots



## Functional

- ▶ Validate all the workflows
- ▶ Enable to auto popup in case of no response from user to use
- ▶ Prompt users to address based on the time zone
- ▶ Ask for the user details
- ▶ Validate all the data formats e.g., email Id, phone number, date of birth, order number
- ▶ Upload Images and attachments
- ▶ Conversion should not in infinite loop
- ▶ Test in different network conditions
- ▶ Perform negative testing



## Correctness

- ▶ Generate initial set of questions in polite way to initiate the chat
- ▶ Understand user English and respond accordingly
- ▶ Multiple browsers
- ▶ Loading of chatbots while accessing the webpage



## Security

- ▶ Storing of user details in an encrypted way
- ▶ User details should not share with other stakeholders



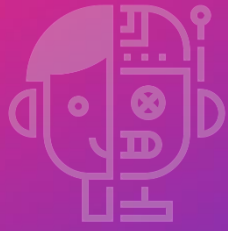
## Performance

- ▶ Response to load webpage and chatbot
- ▶ Opening Chatbot and response time taken for user to provide the response
- ▶ Load testing to validate the response time of chatbot



## Availability

- ▶ Chatbots are always alive and respond once user access the web page
- ▶ Should prompt once page accessed by user/s



## Conclusion

Chatbots have become a common feature on websites and are used in various industries. Testing is crucial to ensure their functionality, correctness, security, performance, and availability. Key test types include functional testing, correctness testing, security testing, performance testing, and availability testing. It is important to validate workflows, handle user responses, validate data formats, and ensure prompt and secure responses. Testing should be done in different network conditions and negative testing should also be performed. Overall, chatbots should be treated like any other application and testing should be done manually and through automation. Integration with CI/CD pipelines can enable continuous testing.

## About the Author



### **Kishore Kandula**

*Competency Head*

Kishore Kandula is a technology leader with 20+ years of experience in testing, test automation and devops in the software service Industry. He has worked with various customers including banking, oil and gas, manufacturing verticals and managed large teams with proven experience in test automation, RPA, devops, and agile initiatives, end to end value stream. He is frequent with participating in customer workshops, providing the right tools, right framework and required approach to generate early ROI. Kishore has established expertise in setting up end to end automation from design to execution using different tools which include licensed and open source as he is certified in test automation, RPA, machine learning, blockchain and metaverse areas.

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