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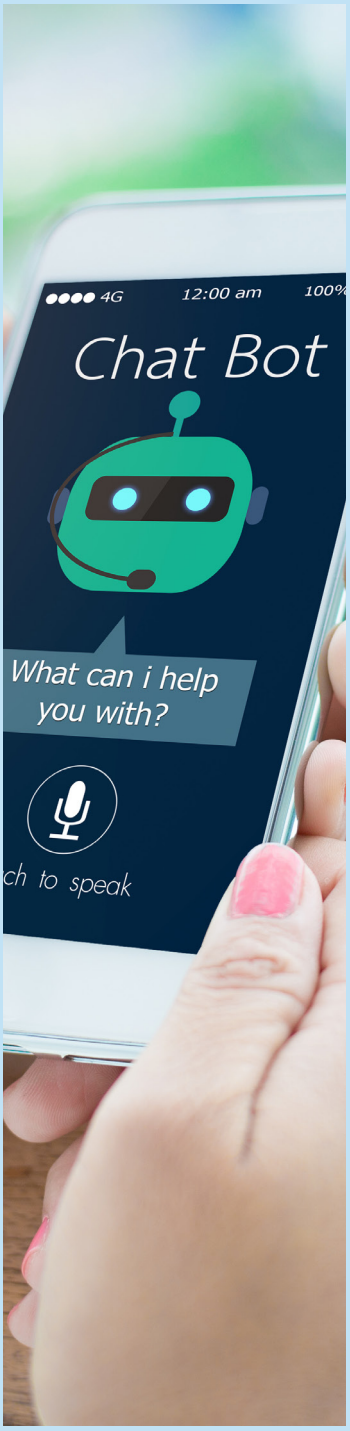

IDENTIFYING THE EFFECTIVE PARAMETERS FOR DESIGNING A COMPREHENSIVE CONVERSATIONAL INTERFACE

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The proliferation of usage of chatbots in businesses are on the verge of mass scale adoption. Gartner has predicted by 2020, 25 percent of all customer support interactions will involve virtual agents or bots while Juniper Research predicts that AI-powered virtual agents will save banking and healthcare contact centers nearly USD 8 billion by 2022.

With the widespread adoption of chatbots in multiple business functions like Human Resources, IT Operations, Sales and Marketing and the likes across various domains, one aspect which actually determines the effectiveness and utility of chatbots is an effective evaluation framework for the same.

From a commercial standpoint, it can be expected that traditional business metrics and KPIs around user retention, user engagement etc. can provide a view of the efficiency of the chatbots. However, this approach provides a unilateral view without taking into consideration the design and development aspects of the chatbots.

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There are various methods to measure the efficiency of a chatbot, based on the perspective from which the chatbot is evaluated.

1. **Information Retrieval:** If the chatbot is essentially an informative bot, the best measure of evaluation can be in terms of measure of accuracy using metrics like Accuracy, Precision, Recall, F-measure etc. These metrics are important to address the functional efficiency of the bot and to have a democratic view over this data, from a user point of view as well as a platform admin or customer perspective. It is highly expected that the chatbot platform or service provider provides a framework to easily evaluate these metrics and understand the functional utility of the bot from time-to-time. However, these are performance metrics that does not always align with the user experience perspective. Also, there is considerable confusion between which measure to focus on while designing a conversational interface; while some users prefer accuracy and precision over recall and vice versa it is actually the business case which determines the comparative importance of the feature.

   For example: In a banking scenario where the user wants to check his account balance or conduct some other transactional activities, then the precision and accuracy of the bot is of paramount importance rather than the recall as any wrong information or answer comes with the possibility of financial loss for the user.

   However, for a business case where the user is looking for information, recall is of more importance than precision as otherwise the bot may lose out on usage traction.

   While considering the importance of recall or accuracy/precision it does not necessarily have to be a pay-off. The aim should be to maximize the F-score of the bot as high as possible to the maximum extent and then work on recall vs accuracy/precision.

2. **User Experience:** Chatbots are essentially interactive conversational interfaces with a user or group of users involved. Hence, we can evaluate it from the human or user's perspective, based on feedback received from users and its task completion capability. This requires the chatbot platform to have a robust framework of capturing user data and the easy accessibility of properly segmented bot level data, for example, through an interactive dashboard.

Bot Level Analytics:

Drilling down, from the user experience point of view, the bot platform should encompass metrics like Total Users, Active Users, New Users, using the bot platform and by leveraging an engagement level with the bot.

From a qualitative perspective, message level metrics like number of conversation initiator messages, Hit and Miss data, total number of conversations and new conversations initiated can provide a comprehensive view about the platform.

Bot Usage Analytics:

From the perspective of the end user, the bot platform can incorporate data points on User retention rate, Goal completion rate and time, fallback rate, User satisfaction measurement through feedback mechanism, response speed, interoperability and scalability related metrics which gives a detailed view of the capability of the chatbot and the sentiment of the users towards the platform

3. **Linguistic:** Chatbots offer a conversational interface which can be evaluated by measuring the degree of support for conversational maxims and other co-operative principles. These principles accommodate some

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of the critical elements that are a part of effective human discourse. These principles refer to Theory of Pragmatics (which encompasses speech act theory, conversational implicature, talk in interaction and other approaches to language behavior) and Grice's Maxims (a co-operative principle which describes how people interact with each other)

4. **Artificial Intelligence perspective:** The most efficient level of chatbot should be able to interact like a human, hence, the Turing Test can be a measure of the capability of the artificial intelligence associated with the chatbot. However, the Turing Test provides only a binary result and as such, it is like a barrier evaluation rather than an analytical evaluation which does not provide any insight on the bot as a whole.

While the Information Retrieval perspective and related metrics give the best view of the Chatbot evaluation quantitatively, the User Experience perspective and related metrics give a fair qualitative overview of the chatbot. An approach which is a hybrid of these 2, taking into consideration all or most of the perspectives mentioned along with some other key considerations, may be a robust frame for evaluation of chatbots.

These four evaluation components form a basis for the assessment of conversational interface platforms or frameworks, which further has to be augmented with business level benefits by considering business level metrics like Increase in Net Promoter Score, customer support savings (from time and money perspective) and Cost-benefit analysis related metrics.

All of these components, brought together can provide a comprehensive framework for evaluation of chatbot using a qualitative, quantitative and business evaluation framework.

Infosys Nia Chatbot Platform is a comprehensive conversational interface builder which comes with many advanced features like analytics dashboard, bot quality framework, conversation prototyping, comprehension capabilities, available out-of-the box that can enable enterprises to implement advanced chatbots for their business processes.

About the Author

Prasenjit Dutta is a Lead Consultant in ICETS with more than 4 years of experience in Product Management and Product Consulting in various areas including Infosys Nia Chatbot, Conversational Interfaces, Edge Products. He is the functional and Go-to-market point of contact for Infosys Nia Chatbot platform developed and managed by ICETS and comes from a Business Management background. He has been involved in multiple prospect discussions, client engagements and initiatives.

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