



## International Journal of Innovative Research in Computer and Communication Engineering

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# A New Chatbot based Hyper-Personalization for Improving Individualized Customer Experiences

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**ABSTRACT:** A user who has got Product A (say a Shoe) the first time in an E-Commerce Website, gets recommendations on products that are similar to Product A and the ones based on his history. The real challenge is when the person wants to get Product B (say Beard Oil) which is totally not related to the first product. This leads to a huge gap between what the user is looking for and what he gets as recommendation. Hyper-Personalization provides a better understanding for User's demands. By taking the Users' location, Intent (what they want to buy) into consideration, we provide Suggestions, recommendations that will give useful, relevant suggestions. This system aims to solve this challenge by using a Chatbot Mobile Application, a conversational agent which can Interact with the user by using Deep Learning Techniques.

**KEYWORDS:** Chatbot; Tensor Flow; Android; Recommendation System; Hyper Personalization;

### I. INTRODUCTION

In the last few years, we have seen chatbots evolve rapidly [1]. From the rule based chatbots that answer questions based on rules on which it is trained on, to self-learning bots that utilize retrieval based [2] and generative models [3] to give a response that is as close to human interaction as possible, the chatbots have improved to an unprecedented level that there exist tests [4] to distinguish humans from chatbots.

Parallely, the advertising sector has also found its own technology induced advantages such as big data, data mining, recommendation systems [5] and so on. The main idea behind technology induced advertising is to improve product suggestions to the customer by suggesting personalized advertisements based on the customer's browsing and buying history. Simple Rule based Question Answer Systems are used for this [6].

However, the problem arises when the customer is interested in a product which is entirely different from their browsing and buying history. Addressing this problem, we propose a hyper-personalization [7] model wherein the targeted customer's product suggestions i.e., personalized advertisements are independent of their past browsing and buying behavior. This ensures that the advertised product doesn't depend on pattern mining but rather relies on a deeper analysis such as geography, demographics and customer's intent.

The proposed system uses a chatbot to analyze the geography, demographics and the intent of the user [8] through the user's device location, statistical data analysis and conversation data analysis such as tone and sentiment recognition. This is implemented with an android chatbot which employs IBM Watson SDK and Bluemix console for interaction.

Geocoding [9] is done to acquire data for geographical and demographic analysis such as weather conditions, disasters etc., where the demographic analysis is done using the dataset belonging to the places within a marked region which is in proximity to the location obtained through the geocoding process. Based on the information thus procured, related advertisements are made as product suggestions to the customer thereby carrying out hyper-personalization by creating individualized customer experiences.

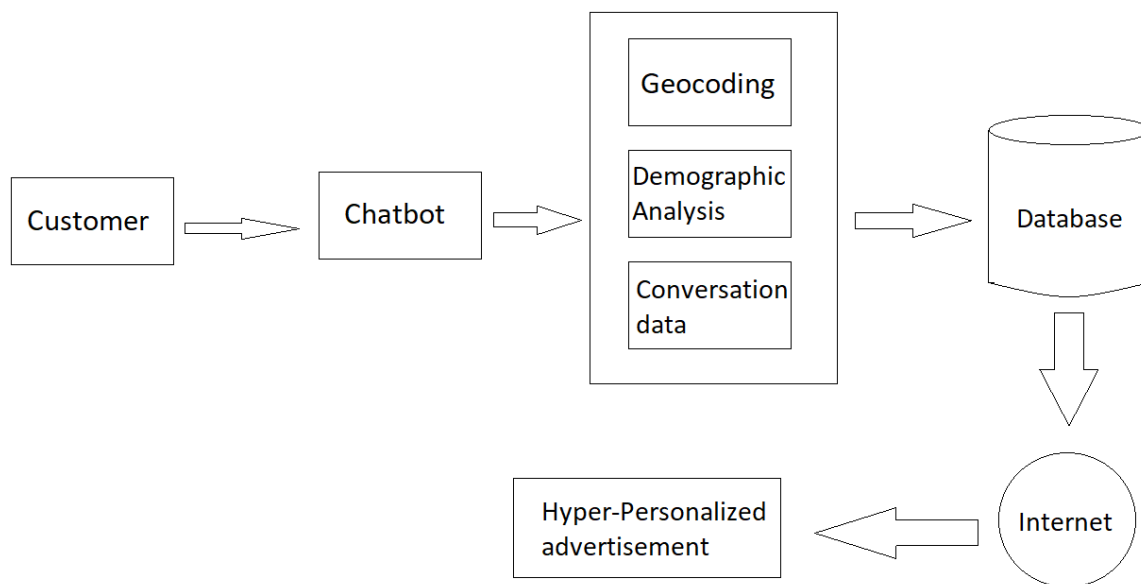
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## II. PROPOSED MODEL DIAGRAM



## III. IMPLEMENTATION

The steps involved in the Implementation of the Chatbot are :

1. The Android App is integrated with *IBM Watson SDK*
2. Read User Input using *EditText*.
3. The *IBM Watson Conversation API* is used. It's parameters are:
  - a. Version Date
  - b. Username of IBM Bluemix Account
  - c. Password of IBM Bluemix Account
4. Create a workspace for the *Conversation in the Bluemix console*-It is an easy tool that helps to create and manage workspaces.
5. Add intents, entities, and sample keywords or examples to it.
6. The User Input is sent to the Conversation service wrapped in a *MessageRequest* object.
7. The app internally calls the *Watson Work Services*.

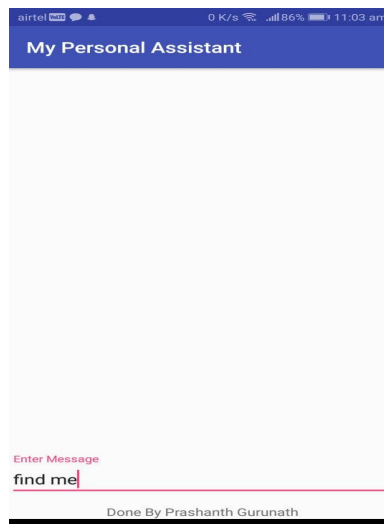


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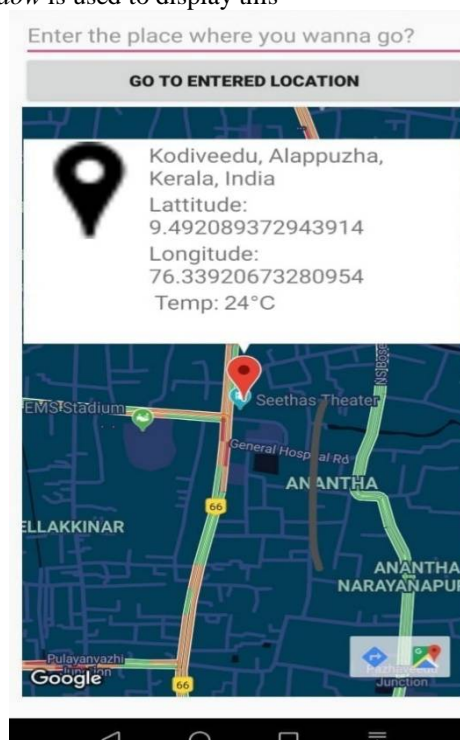
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Vol. 6, Issue 8, August 2018



8. Using these, the users' location is found.
  - a. A marker is used to plot the current location of the user on the map
  - b. The Lat-Lng Details are displayed
  - c. By *Geocoding* ,*Reverse Geocoding*, we display the Place Name along with the Admin Area, Sub Admin Area details.
  - d. *Open weather Map API* is used to display the Temperature.
  - e. A *Marker Info Window* is used to display this





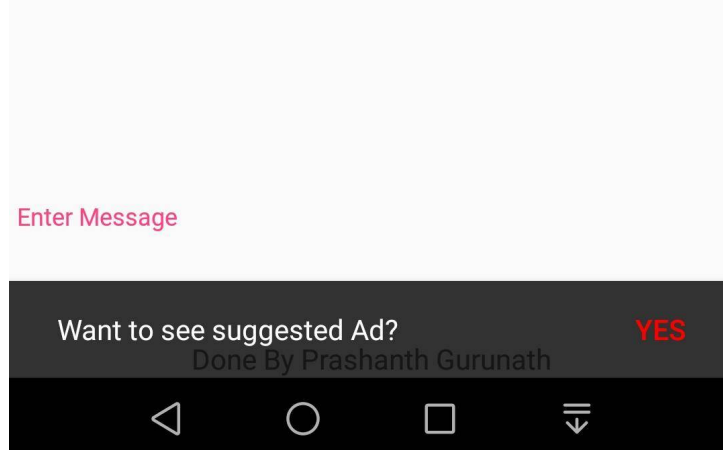
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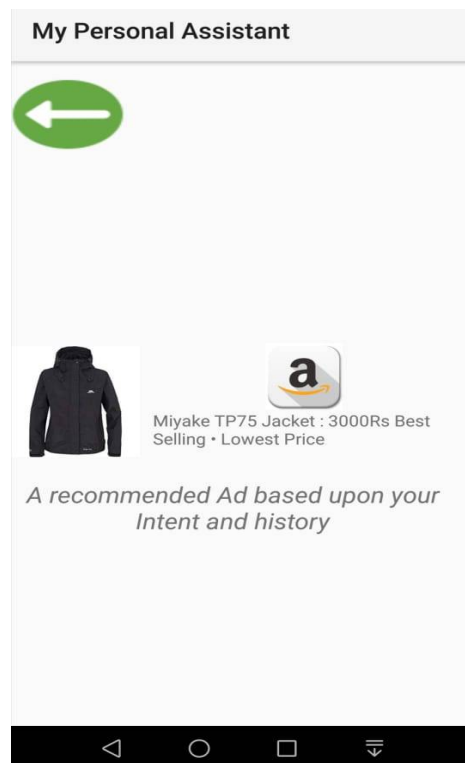
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Vol. 6, Issue 8, August 2018

9. Based on this weather, location Information, the recommended ad is displayed and the user is notified.



10. On choosing Yes, the User gets to see the ad and thus *Hyper Personalization* is done. The history of transactions alone isn't considered. Keeping In mind, the intent of the user and their location details, the following ad is displayed:



11. *Tonal Analysis* is also done and we display :
- The type of message(Positive or Negative)
  - The Language
  - The Score(weight) out of 1



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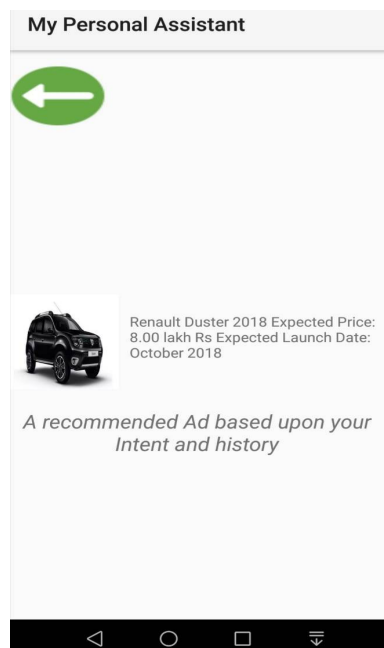
Website: [www.ijircce.com](http://www.ijircce.com)

Vol. 6, Issue 8, August 2018

12. We get this in the form of a JSON from Watson service.



13. We recommend an ad based of this if the Score is more than 50%, that is, more than 0.5/1. This means that the user's intent to get the car(in this example) is very high.





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## IV. FUTURE SCOPE

Chatbots use Artificial Intelligence and they will be able to have multi-linguistic conversations. This enables chatbots to understand hybrid languages like 'Hinglish' (Hindi crossed with English) with NLU. Using this with advanced NLG, personalized Ads, Hyper Personalization can be done in the future.

The main difference between chatbots and humans is empathy understanding. Chatbots simply aren't as adept as humans at understanding conversational undertones. With the rise of Conversational Interface (CI), we can have a richer and more dynamic user experience.

Chatbots can collect and store the customer's preferences and later customize that interaction. In the field of CRM, this could be much more efficient than a person having to look through history, existing data.

Chatbots can also be used for Website Maintenance, Code Checking, medical diagnosis, prediction of stocks, data using Machine Learning, Natural Language Processing.

## V. CONCLUSION

Hyper-personalization has been proposed via deeper analysis methodologies including but not just limited to analysis of buyer behavior and history but also methods such as geographic, demographic and tonal analysis using an android chatbot system.

The proposed solution helps to create better experience for the target customer by suggesting products as advertisements which are carefully selected by finding patterns beyond the history of the customer, thereby creating individualized personal product suggestions for the target customer.

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