Intelligent Chatbot for Easy Web-Analytics Insights

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Abstract— **In this fast-moving data-driven world, it is vital that we draw the accurate insights to make the right decisions at the right time. In terms of online websites, there are many web analytics tools that will give us performance reports. However, it is tedious and time consuming to master the tools leave alone to derive insights to understand the business impacts. In this paper, I am comparing 2 widely used analytics tools based on their ease of use. In the light of the same, I am proposing an Artificial Intelligence Machine Learning (AIML) driven chatbot, that is fueled with analytics' raw data, that will enable bot-users to get business insights by just typing in the query.**

Keywords—web analytics, AIML, chatbot

INTRODUCTION

In today's world everything is possible online; From paying the bills to buying a product. For businesses to survive in this era, it is important to have their presence online, like a website, and to know how well they are performing in the online world. For them, accurate business insights, at the right time, can make miracles come true. There are many web analytics tools available in the market, that tracks the website-user performance in the websites. However, mastering these tools and drawing insights is time consuming and is tedious.

In this paper, I am proposing an intelligent chatbot that is not only easy to use but also helps the bot-user derive faster business insights. The bot is friendly as it can respond to common greetings and conversations. The chatbot is built using Artificial Intelligence Markup Language(AIML)[2] and the required data is fetched from analytics tool's raw data. The raw data consists of all tracking details made by every website-user.

In this paper, I will be conferring about 2 types of users such as bot-user and website-user. Bot-users are the users for whom the chat bot is designed and website-users are the users of the website of which the bot-users wants to know the performance. Bot-users would mainly be the website owners or marketing team members.

A. AIML

Artificial Intelligence Markup Language (AIML) [2] is a set of possible queries and their respective responses. AIML consists of 3 elements such as: categories, pattern and template. Every category consists of a pattern and a template. Patterns are the possible queries that the bot-user may type in and template is the response to the respective pattern. Here, the template is programmed to fetch the data accordingly from the analytics raw data, if it's a domain related query. Fig. 1 is an example of a simple AIML.

Code:

```
<category>
        <pattern> How are you </pattern>
        <template> I am fine </template>
</category>
```

Outcome:

User: How are you

Bot: I am fine

Fig. 1. AIML example

B. Working of a basic web analytics tool

Web analytics is the method by which a website-user's journey is tracked in a website. By doing so, the overall success of the website can be understood. On what basis we should measure the website performance depends on why the website is created. Once the key measurement parameters are identified, web analytics tools can be configured accordingly to track the same.

A web analytics tool, when integrated to a website, will track every website-user's activity. The tool is integrated to the website by placing a code snippet in the head or body section of all the page that needs to be tracked. The code runs when the page is loaded and every time a website-user interacts with the page, the data is collected in configured variables which is then sent to the analytics server. The raw data is then processed and classified as reports based on the tool configuration. The variables collected can be laid out either as a dimension or a metric. A desired report can be viewed by selecting a dimension and measuring it against the respective metric. The unprocessed analytics raw data is the source of data for the chatbot. Unprocessed raw data consists of URLs, Country, Devices, Page name, etc as dimensions and number of instances of all the dimensions as metrics.

RELATED WORK

Md. Shahriare Satu and Md. Hasnat Prvez[1], in their paper gives us a review of systems which uses AIML based chatbots to interact with user. He points out that by integrating such chatbots to system, it can give service around the clock and is low cost.

Sarthak V. Dothi and his team[3] proposed an android application that uses AIML interpreter to interact with users using texts and voice responses.

Rinkal D. Dharani and Dr. A. C. Suthar[4], proposed a model in which AIML based chatter bot is integrated with WhatsApp to receive news update.

E-business chatbot[6], developed by Thomas NT, uses AIML and Latent Semantic Analytics(LSA) to give response to the users for their e-commerce based queries. The data set used here is the FAQs.

CHARLIE[5], is an AIML based chatterbot that is used in the field of education. CHARLIE connects students to INtelligent Educational System(INES). It is programmed to maintain general conversation with the students about the learning materials.

Comparison of Web Analytics Tools:

TABLE I. COMPARISON OF WEB ANALYTICS TOOLS

SL No	*Ease of use*	Web Analytics Tools	
		Google Analytics	***Adobe Analytics***
1	Training Required	Yes	Yes
2	Drag and drop features	No	Yes
3	Documentation	Lengthy	Lengthy
4	Integration with the website	Comparatively Easy	Tedious
5	Time of response from the tool expertise after an issue or query has been raised	1-2days	1-2days
6	UI	Confusing	Confusing
7	Effort required to create a desired report	Training required	Training Required
8	Terminologies used in the tool	Needs training to understand	Needs training to understand
9	Tool tips	Available for the matrices	No
10	Search functionality for reports	Yes	Yes

PROPOSED MODEL

It is a tedious and time consuming task to master a web analytics tool. In order to get the optimal report, we need to understand the terminologies and the tool functionalities. In this paper, I propose a chatbot that will help the bot-user understand the website performance by just typing in the query. The bot-user will be notified on the pattern by which the query has to be typed. The analytics raw data is to be fed to the chatbot by downloading the same from the tool's server, prior to the usage. Fig. 3 depicts the proposed model.

Once the bot-user types in the query in the chatbot, the AIML developed chat bot will identify the category that contains the query pattern. Here the bot-user is expected to type in the query in a predefined pattern. Once the query pattern is matched, template of the category that contains the response is sent back to the bot-user. There are 3 query scenarios that can be considered.

Scenario 1: Domain Related Query

If the query is domain related, then the chatbot will connect with the data source i.e. Analytics raw data to get the desired data. The data once retrieved from the database is then shown to the bot-user. For example:

Bot-User: Page views on August 2018

Bot: 3,00,000 page views

Scenario 2: General Queries

Queries that fall under general category are "How are you", "What is your name" etc. Such expected general queries will have their respective predefined responses as templates.

Scenario 3: None of the above

If the query typed in by the bot-user does not fall under any of the known categories, a default response like "Invalid Query" is sent back to the bot-user.

EXPERIMENTATION

The prototype of the proposed model was given to a group of 20, that consists of business analysts and marketing

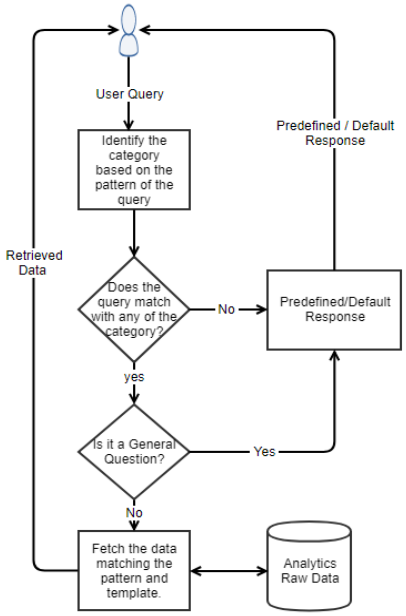

Fig. 2. Proposed Model

team members, who uses web analytics tools to measure their website performances. The group was notified on the pattern by which they should type in the query.

A few of the accepted queries typed in by the group are:

1. Page views on August 2018
2. New visitors this month
3. Visitors from US in 2017
4. Bounce rate this month
5. Pdf downloads in last 3 months

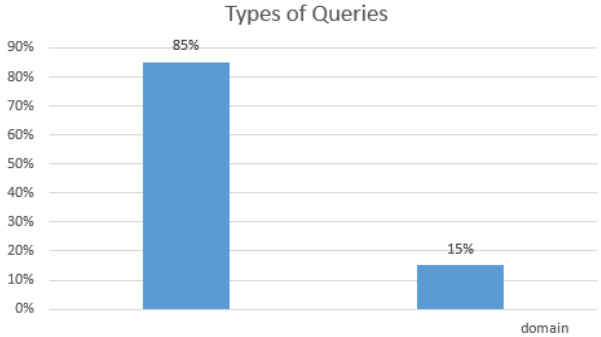

Fig. 3. Queries

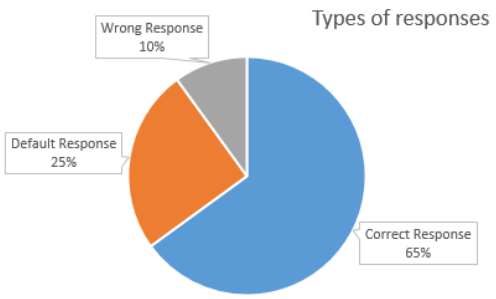

Fig. 4. Responses

Among the queries entered by the group, 85% of them where queries related to the domain, i.e. web analytics. However, the rest 15% of the queries where general or unrelated queries. Fig. 4 depicts the query types.

The bot responses were analyzed and were classified as wrong, default and correct. The correct responses are the expected domain related answers. More importantly they were the correct answers. Whereas the wrong responses are the bot response to the domain related answers which are wrong. This can be avoided by further refining the bot. The default responses are the bot response to the general or unrelated queries. Fig. 5 depicts the response types.

CONCLUSION

In this paper, I propose a chatbot that would enable bot-users to just type in the query related to web analytics and will get response immediately. This is to avoid the time consuming task of mastering a web analytics tool. The proposed chatbot is developed using AIML and the data set is the raw analytics data. Experiments were conducted to understand the performance of the tool. The tool was evaluated based on the quality of response and it performed well.

Since the chatbot is developed using AIML, the bot-user has to follow a pattern by which he can type in the query. I would like to extend my work by further refining the chatbot and making it more intelligent so that the bot-user need not follow a predefined pattern while entering the query.

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