Customer Zodiac – A Way to Understand Customer Pain Points to Improve Customer Service Satisfaction

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Abstract: Now days customer satisfaction has become crucial aspect of success of any product or organization as it directly impacts if customer would keep using same product or choose to an alternative. Most of service industries focus on providing best service and support for products and concentrates on time to answer customer concerns, having correct resources like domain experts. Considering customer support engineers its hard to sense nature of customer for avoiding dissatisfaction, its always needed to relay on static guidelines followed by organization like time to respond, keeping up with domain knowledge, communication skills. The goal of this project is to provide guidelines on each support case by understanding customer interaction using historical data. The historical data of customer would help to understand which things are important to customer, what he or she likes or dislikes, what kind of interaction is mostly preferred by customer, does he have problem with any specific product. By applying data mining techniques on historical data of customer interaction with customer support it would help to understand these trends which should help to improve customer satisfaction.

Keywords: Artificial Neural Network, Data Mining, Machine Learning.

I. INTRODUCTION

Data mining has already been applied to multiple domains like Financial Data Analysis, Retail Industries, Intrusion Detection systems. This project aims to work on historic data of customers to find out major aspects which have been caused dissatisfaction which should help to improve customer satisfaction. In general customer support industries work on Web Portal which provides a way to interact with customer. Customers have access to some major parts of portal accessible like fields to raise a support case where they can state problem, give brief information regarding same, if there are any logs or diagnostic data available it can be provided too. The other side of portal is accessible to customer support engineers or organization, this side has many more factors visible like, Service Level Agreement(SLA) details, internal work details (private comments), customer account details, special notes for customer account if any. All details which are accessible to customer support engineers are static in nature which helps somewhat to understand nature of customer. There are also static guidelines which have been asked to follow by customer support engineer to keep customer happy. The guidelines include Service Level Agreements of each severity of customer support case, how frequently it is required to call customer or take follow up if there has been no reply from customer, when it is good to close raised service request. All of these are static guidelines which have been asked to follow for each and every customer by customer support engineer. When this project would be implemented it would provide dynamic guidelines to handle each customer case with care. It would be possible to get dynamic guidelines as there would be huge customer historic data available to

process using data mining techniques and which would be specific to customer. The data mining techniques used for this project would be Artificial Neural Network and Back Propagation. Artificial Neural Network is proven technique for better results in data mining when it would be used with Back Propagation it would help to change guidelines as per customer accounts considering changing trends or needs of customer.

Considering any customer service organization then these are some major aspects which impacts customer satisfaction Product, Time to close service request, Time to update service request, Remote sessions, Customer calls with these there are other factors too which provides details on where customer has problem with and which things should be avoided for specific customer such as it is not possible to provide diagnostic data for customer if it is highly sensitive and may cause business impact, it is not possible to take remote system access as those are behind DMZ(demilitarized zone), it may also happen that customer wants case to be handled by specific region engineer or sometimes customer is only comfortable with a specific engineer to work with. There are customer feedback surveys too which provides ample of information for understanding what is working for customer and what is not.

All of these information is available in customer accounts historic data which can be processed and meaningful guidelines can be shown for each customer's service request. This would definitely help customer service engineers to improve customer satisfaction and keep customer happy.

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II. MOTIVATION

When working as customer support engineer it is always required to sense nerves of each customer to get better customer satisfaction. Its challenging to get hold on each customer requirement as written guide or static guide which makes it complicated to understand varying needs of customers. To help customer support engineers for understanding customer pain points and needs its require to have a application which has dynamic nature and assists customer support engineers to improve customer service. The customer satisfaction also directly impacts organization's business as if customer is not happy with service then there are higher chances to lose that customer. Considering competitive market of IT industry there are always options available to provide same kind of service in more or less pricing which makes customer service satisfaction important. Keeping customers satisfied should help to keep customer subscriptions or product renewal with same organization without losing valuable customers. This should help sales and marketing teams too when it comes for subscription or product renewal as there would be less efforts to actually convince customer for keeping up with same service instead of choosing competitor.

III. LITERATURE REVIEW

A. Survey of customer service satisfaction,
The report [1] provides statistics of customer service considering,

- Random samples of consumers aged over 18 plus years are taken. Total one thousands of interviews were taken [1].
- Interviews were conducted by Ebiquity between August 19th and September 2nd 2014 [1].
- The overall results have margin of error +/- 3.1 percentage [1].
- This survey shows importance of customer service and how it affects overall organization's performance and growth.

Below are some important statistics,
1) Fig. 1. shows just over six in ten(62%) customers believe that companies meet their customer service expectations. Only 5% consumers said that customer service experiences they have with companies usually "exceed their exceptions" [1].

2) Fig. 2. shows nearly two in five customers think that companies pay less attention providing good customer service. Down from 7% in 2012 and 6% in 2011, only 5% of consumers said that the customer service experiences they have with companies usually 'exceed their expectations' and 29% said that companies usually 'miss their expectations' for customer service (down from 31% in 2012 and the same as 29% in 2011) [1].

3) Fig. 3. shows consumers will spend more with companies that provide excellent service. 74% consumers paid more with company for getting good customer service. About two third of consumers willing to pay more with company which provides good consumer service. On average consumers are willing to spend 14 % more money [1].
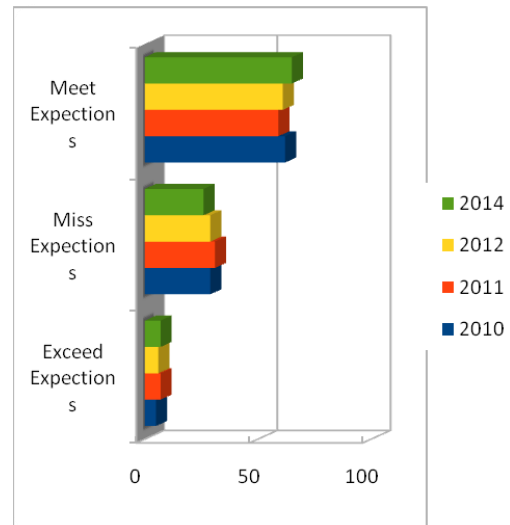

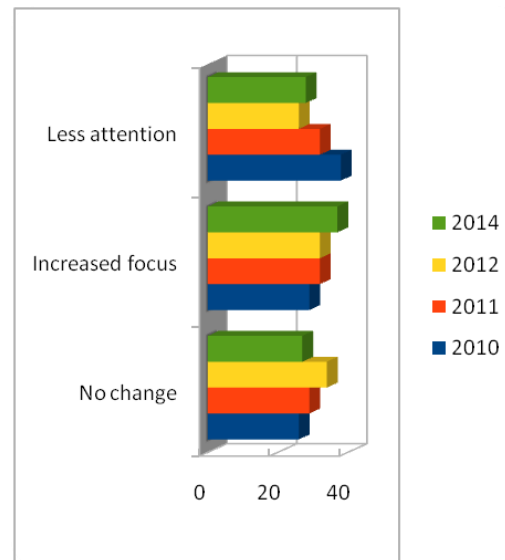Fig. 1. Graph shows how customers think about if businesses meet expectations

Fig. 2. Graph shows how customer satisfaction focus has changed over years
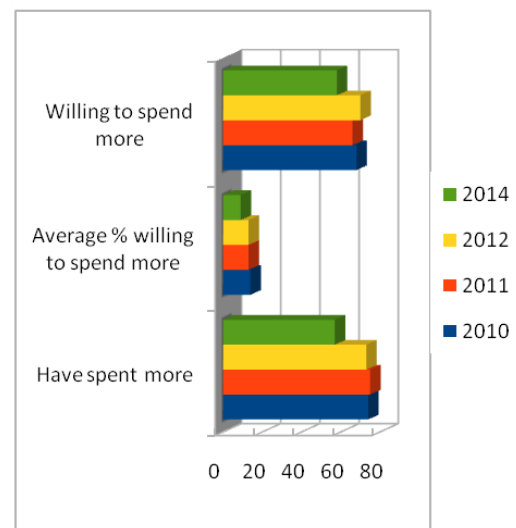

Fig. 3. Graph shows statistics of customers who are willing to pay more for good service

B. Survey of data mining techniques used for heart disease prediction,

The heart disease is not easy to predict or detect as it is not visible for naked eyes so there were systems proposed for detecting heart disease using neural network and back propagation algorithm [2]. Now days there are multiple good treatments available for any disease in medial field but it is always challenging to give correct medical treatment to patient on time. Among all diseases most threatening is heart disease as it raises its head when all of its limitation has been crossed and which are difficult to understand; proposed system [2] helps to avoid this kind of emergency and start with correct medical treatments before hand which would help to save patients life. Many hospital systems use health care applications to maintain and manage patient's data, there is huge data available in text, images, numbers and charts format. All of these data have been used to have a system [2] which would analyse it, process it and would relate it to new patient's data. Algorithm [2] uses historic data of patients to predict possibility of heart disease for new patients considering and relating similar trends and attributes which adds in for occurring heart disease. The objective of this system [2] is to develop a prototype to collect this historic data and using decision systems, artificial neural network, back propagation help to predict possibility of heart disease. Similar system [2] can be implemented for customer support organization which helps to understand customer pain points [1] and improve customer service satisfaction. Some major points to consider here are Artificial Neural Networks and Back Propagation [3] algorithms can be used to work on historic data for understanding customer needs.

IV. OBJECTIVE AND SCOPE

The objective of this project is to provide guidelines for customer support engineer or associate for each case raised by customer. These guidelines would be generated as per historic interactions with customer which has happened with customer support. The guidelines would be dynamic considering things which customer likes or dislikes when doing interactions with customer support. For new customers which are not having any history of customer support organizations best guidelines depending on other customer interactions would be suggested.

This project would help customer support engineers to have To Do's or guidelines for each customer account separately which would help while interacting with customers. When service request would be opened by customer application would predict which all things should be taken care for customer and which should be avoided, this would avoid dissatisfaction of customer as actions or events which has been occurred in history would not be repeated for customer and there would be guidelines to keep customers satisfied with service provided.

V. METHODOLOGY

The project would be implemented using Ruby on Rails platform featuring a Web Portal for raising service requests for customers. The customers and customer support engineers would have accounts on same Web Portal, both customers and customer support engineers would be having different permissions to access portal. The Artificial Neural Networks with back propagation [3] would be used to work on historic data of customer to train itself for guidelines on new cases opened by customers. Considering new trends of customer exceptions, satisfaction and dissatisfaction there would be changes in how Artificial Neural Networks [3] decides what is good and bad for customers.

VI. DESIGN PROCESS

The application would have two major modules project front end and backend engine. The front end would be responsible for displaying guidelines, suggestions for cases. The backend engine would be processing new data as per algorithm which would be based on Artificial Neural Networks and Back Propagation [3]. Both front end and backend engine would be accompanying with a common database which would help to work on historic data plus store new guidelines. There would be one database defined for application and might content at least five tables each for customer details, support engineer details, web login details, case information and guidelines.

The design would start from Web Application first which would include front end and then it would be integrated with backend engine and database. Below are details of each module,

1) Frontend - This would be GUI which would be exposed to customers and support engineers. Customers and support engineers would interact each other using this GUI. For customers this would provide options to create new support case, add comments to support case, provide log files by attaching it to case, add details about support case like product, problem definition, description of problem, log if any, severity of problem. For support engineers this GUI would help to expose more details of customer support case, like customer account details, case number, customer satisfaction details, private comments, case summary, next action plan etc. Support engineers would be able to take ownership of cases which would help to track who is working on which cases and there would be no duplication of work. It would be also possible to categories support cases by product in case support engineers require that.

2) Backend Engine - This module would be having logical implementation of how guidelines would be generated for a support case, it would use an algorithm based on Artificial Neural Network to define what should be things which support engineers needs to take care of for a support case. Algorithm would be first trained for historic data of customers and then it would be applied to live customer support cases. The algorithm would keep on changing as per nature of customer which would be possible to sense as per his further interaction with support engineer which would be available in database. This changing property of algorithm would help to give dynamic suggestions or guidelines to support engineers for taking care of case.

The back propagation algorithm would be added with Artificial Neural Network to keep changing algorithm when there would be change in customer nature of interaction, needs and requirements.

ACKNOWLEDGMENT

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