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Audience Response Analysis System (ARAS)

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Abstract: Audience Response Analysis System (ARAS) was developed for Exact Training Consultant Company. The purpose of developing this system is to restraint problems that occus when Question & Answer (Q&A) sessions are conducted to any events. A series of interview sessions were conducted with four candidates inside Exact Training Consultant; including the Director, Area Manager, Program Manager, and the Main Coach to explore requirements for the system. This system will help to increase the efficiency and the effectiveness of two – way communication in any events by having Q&A session throughout the seminar or events. After the organiser register the event details, and system will gather any information gained from organiser and are obliged to set an event code in the system. As for the audience, organiser will ask the audience to open the system's website and enter the key code. Then, audiences will be allowed to ask questions, like and dislike questions that has been asked by other audience. Every month or yearly, the company will make some progress report based on the categories of the seminar that they held throughout the month or year. The system will then make analytics questions that were gathered from audiences and make sentiment analysis to handle manual report constraints. By having this system for Exact Training Consultant, it will improve the questions and answering session in any occurring events for the future. This will also improve the administrator to actually review feedback, generating report without having any problems and also to predict either the events are in positive feedback or in negative feedback.

Keywords: feedback analysis, question and answering, sentiment analysis, big data analytics, data dictionary

1. Introduction

Speeches, seminars and interviews commonly end with an opportunity for questions from the audience. This segment is potentially the most fascinating and informative part of a presentation[1]. However, if the speaker takes firm control, Q&A session has a proclivity to wander from its intended course. Q&A sessions are usualy the most impotent part in events whereby some of the audiences do not interact with the speaker when they are prompted to ask questions in the events. The objectives of developing this system is to analyse audience response using the concept of big data analytics and to provide automatic generated report. The system will use Rapid Miner software as a tool to provide more statistical and analytical report for the company.

2. Background Study

Exact Training Consultant is a company from Sepang, Selangor which provides training consultancy and youth development. This company conducts seminar and training in mass audience events. Exact Training Consultant targeted audiences are basically in the range of 16 years old up until 40 years old. Every 6 months or so, Exact Training Consultant will gather questions that were prompted by the audience, and generate a report based on the category of the seminar. When handling a seminar or event, the organiser will take 5 – 10 minutes of additional time to gather any relevant questions from the audience, for those who want to ask any questions related to the event. These 5 – 10 minutes however will be discarded as most audiences will only remain silent due to lack of focusing in the event,

inactive student and there are also some introverted audience where they are too shy to ask question eventhough they had one.

There is also no doubt that some audience may have forgotten the questions that they want to address during the event. This problem has a very bad effect on the seminars or events session because the Q&A session is a very effective and informative slots to gather questions and will be corrected by the organiser. Exact Training Consultant found that by compiling reports manually is very difficult, causing some constraints to the company itself and would take about 2 – 3 weeks to be done.

ARAS saves the organisers tentative wisely, no longer the need to wait for the audience to ask if they have any question. This system acts as a platform and tools for the organiser and audiences to have two – ways communication and operate as a medium for both parties to interact with each other by using this system. This system is operated to ensure all relevant questions and feedback reaches the organiser to analyse and respond accordingly. The organiser can plan their talk to address the key interests and guide the Q&A session of the event.

ARAS uses the concept of Big Data and Analytics, specifies in Sentiment Analysis where it is a method to determine whether the feedback given by the user is positive or negative[2]. The system also provides graphical information by using pie chart to conclude on how many percentages of negative and positive words gained from the gathered questions.

3. System Design

There is a lack of studies on feature selection and machine learning algorithms for Malay sentiment classification[4,5,7,8]. The design of ARAS is based on the user requirements gathered as well as the studies which feature selection and machine learning algorithms for Malay sentiment classification has been researched. Several techniques are used to model the design of the proposed system, including architecture diagram, system design and database design. This will help to improve the understanding of the the system, for both the user and the developer.

3.1 Architecture Design

The architecture design in Figure 1 represents the elements involve in the proposed system. Figure below shows the flow of the architecture. The audience need to have a laptop or mobile phone with browser and internet connection to access the website. For security purposes, the system need to have a firewall to control the access into the web server and database server through the router.

Comprehensive study of data analytics tools has been done using RapidMiner and Hadoop[3,6]. As for extracting the data analytics, this prototype system used RapidMiner. The operators that had been used inside RapidMiner were Retrieve, Nominal to Text, Store, Tokenize, Transform Case, Filter Stopwords, Filter Tokens, Stem and Analyze Sentiment and for exporting, Write Excel.

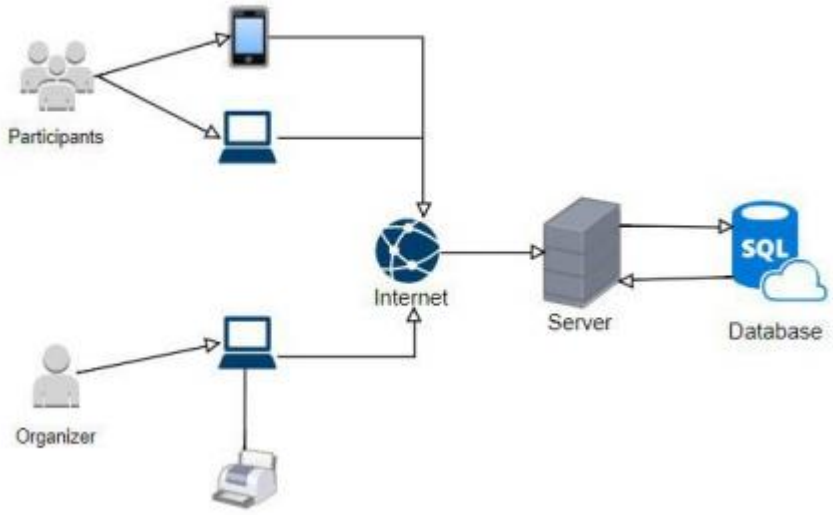

Figure 1. Architecture of Audience Response Analysis System

3.2 Use Case Design

The use case diagram in Figure 2 shows how users will interact with system elements. Figure below shows the overall use case diagram representing the entire interaction between the user and ARAS. Use case description in Table 1 will help to improve understanding the system both by the user and the developer. Audience Response Analysis System (ARAS) consist of ten (10) major use case and ten (10) related use case, containing 3 actors which is including Administrator, Participants and Organiser.

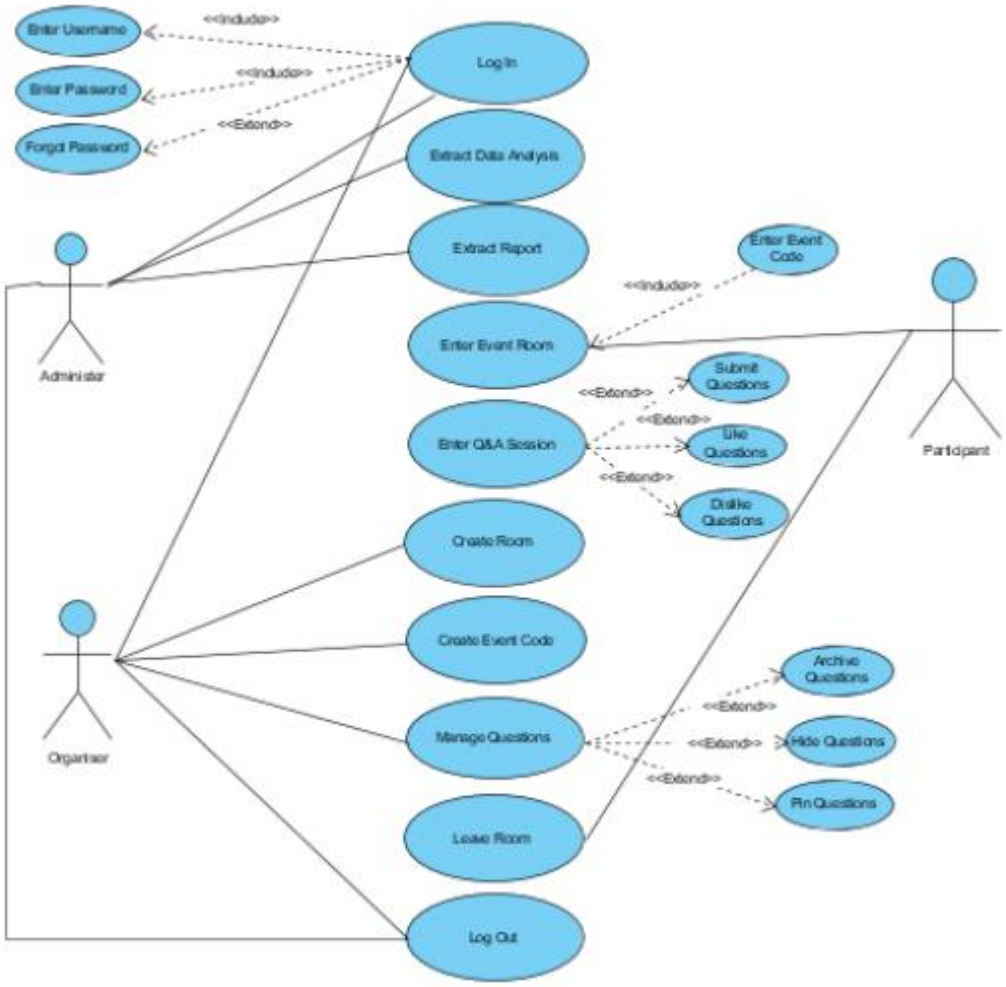

Figure 2. Overall Use Case Diagram

Table 1. Use Case Description

Use Case	Use Case Description
Login	Administrator and organiser will key in their credentials into the system
Extract Data Analysis	This use case is only applicable for Administrator only. At the end of the month, or yearly, admin can extract the data analysis that has already been made by the system. Admin can choose whether to compile report by week or categories of events that was held throughout that month.
Extract Report	Admin can ask the proposed system to extract the report that will be made by the system. The report that were made are only for data analysis structure , and admin can choose either to print, view the report or edit the extracted report.
Enter Event Room	Event code are given from the organizer, in order for the participants to ask questions. They event code are created by the organiser. User need to enter the keyword to access the room session, only then the audience can submit questions.

Enter Q&A Session	Audience can manage questions given from other participants. Participants can either submit questions, like or dislike other questions. Like : Questions that are relevant for the audiences wanted to ask the same questions, they can like the question. Dislike : Questions that are irrelevan or redundant will be dislike by the audience.
Create Room	Organiser need to create room in order to ask audiences to join the question and answering session. Organiser need to fill in the event details such as name of the event, event code and event period. The details will then be stored in database.
Create Event Code	Organiser need to create event code for the specific room session to give it to the audience. Organiser is compulsory to generate the keyword with alphanumeric character.
Manage Questions	Organiser can manage the questions given from participants. Organiser can pin questions to the top, hide the questions or even archive the questions. Before the questions go live, organiser will filter the questions.
Leave Room	In order to close the live session room, all of the audiences need to leave the room. A button below the live session web page will be placed at the bottom of the page. For security purposes too, it is compulsory for the audiences to leave the room.
Log Out	When all of the actor want to log out from the system, actors have to click on the “Log Out ” button and the system will be linked to the main page. Database will update any latest changes that have been made and it will be saved.

4. Interface Design

Figure 3 depicts the example of the interface design. This example is for the Data Analysis Interface. The pie chart shows the differentiation between positive and negative words accumulate from the audience's questions. List of words are written inside the database where all these words are classified into two; Positive and Negative. Once the audience submitted questions, the system will classify the question either it has more negative words or positive words. Then , to make it more interactive, instead of using text, the system uses Google Charts (Pie Chart) to make it more understandeable. The pie chart are classified into two; Positive and Negative.

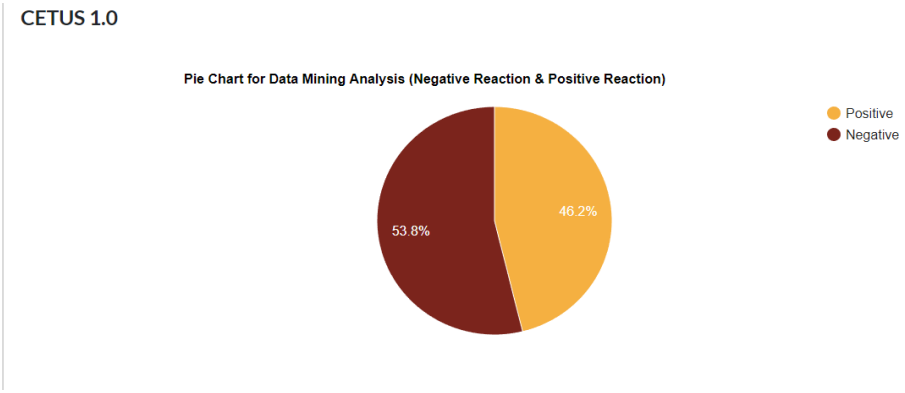

Figure 3. Data Analysis Interface Design

	Reaction_ID	Positive_Word	Negative_Word
Edit Copy Delete	1	great	bad
Edit Copy Delete	2	good	worst
Edit Copy Delete	3	best	not good
Edit Copy Delete	4	awesome	hate
Edit Copy Delete	5	like	ridiculous
Edit Copy Delete	6	super	don't like
Edit Copy Delete	7	abound	not abound
Edit Copy Delete	8	accept	decline
Edit Copy Delete	9	claim	disclaim
Edit Copy Delete	10	accessible	unaccessible
Edit Copy Delete	11	accurate	inaccurate
Edit Copy Delete	12	achieve	not achieve
Edit Copy Delete	13	adaptable	unadaptable
Edit Copy Delete	14	adequate	inadequate

Figure 4. List of Data Dictionary

5. Conclusion

Audience Response Analysis System (ARAS) has created one great platform for the company to provide new way of question and answering session. In general, most effective tools could be used to be simplified and efficient for the functionality of the system in more adherences to coding standards and conventions. Author has successfully reached its objectives target to develop Audience Response Analysis System (ARAS) . For the company, they had trouble when making conversations in events between the participants. ARAS able to conduct sessions for Q&A, dual communication way of raising questions, able to store all the information given, able to analyse data drive from the audience thus it can ease the administrator to make good report.

In order to make sure the system able to achieve big data analysis concept, Naïve Bayes Algorithm and further research has been incorporated in the system to gain data analytical process. Naïve Bayes comes to the concept and idea where the prediction of unknown data sets can be done with the use of his algorigthm formula. Naïve Bayes technique is selected rather than Support Vector Machine or other technique because Naïve Bayes' classification result for polarity of the word processed are way better than other techniques. Other than that, Sentiment Analysis is done to generate text classification. The purpose of Sentiment Analysis is to determine whether a text is positive or negative. ARAS able to analyse audience responses using the concept of big data analytics.

When a specific event is done for the day, administrator can choose either to view reports by start and end time, report by category, by event code or overall report. This can be done inside the system where the system will gather all data inside database and compile to be a useful report.

For future improvisation, by having tools like RapidMiner embedded inside the system would be good when analysing data for prediction analysis and other data analytics work. Other recommendation that comes to think of it is by having notifications each time a question is submitted from the audience. This is to prevent any over – looked questions.

6. Acknowledgements

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