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Correlating Customer IVR Journey to their CSAT Scores

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ABSTRACT

Interactive Voice Response (IVR) system is a powerful tool that automates routine inbound call tasks. Companies leverage this system and realize substantial savings by cutting down call center costs while customers from do-it-yourselfers to non-tech-savvies take advantage of this technology rather than wait in line to speak to a Customer Care Representative (CSR). The flip side of the coin is that customers often see IVR as a barrier to overcome in order to talk to a real person. So it is important that the IVR is managed in such a way that it is mutually beneficial for both businesses and their customers. If managing IVR is critical then measuring Customer satisfaction scores is paramount as it helps in understanding customers better.

This paper discusses analysis of different use cases of how customer ratings correlate with their journey inside IVR. West Corporation's leading financial services client offers surveys to their customers and customers' rate questions on a scale of 0 to 10 based on their IVR experience (10 being extremely satisfied). Analysis of survey ratings using SAS helped operations identify population specification error that occurred while surveying customers. The error was rectified and this improved customer ratings scores by 3%.

INTRODUCTION

In the world of IVR, understanding a caller's journey is one of the key research areas for data teams. Center for Data Science (CDS) at West performs 'Call Path Analysis' to highlight common IVR paths and hotspots. This analysis helps businesses in understanding callers' behavior and path they take to complete any task inside the IVR. Call Path Research plays a key role in identifying and fixing IVR gaps thus leading to a better caller experience. At times, standard path analysis and reports are not sufficient to assess the true IVR performance and thus surveys can be of great help. West Corporation's leading financial services client offers surveys to their customers in order to understand IVR experience. Closed questions are offered to customers as they are easier to respond and easier for businesses to compare and analyze responses. Figure 1 shows different set of paths that can be traversed inside IVR by a customer. For more information about IVR systems as well as data generated when consumers interact with IVR, see Khots. 2015.

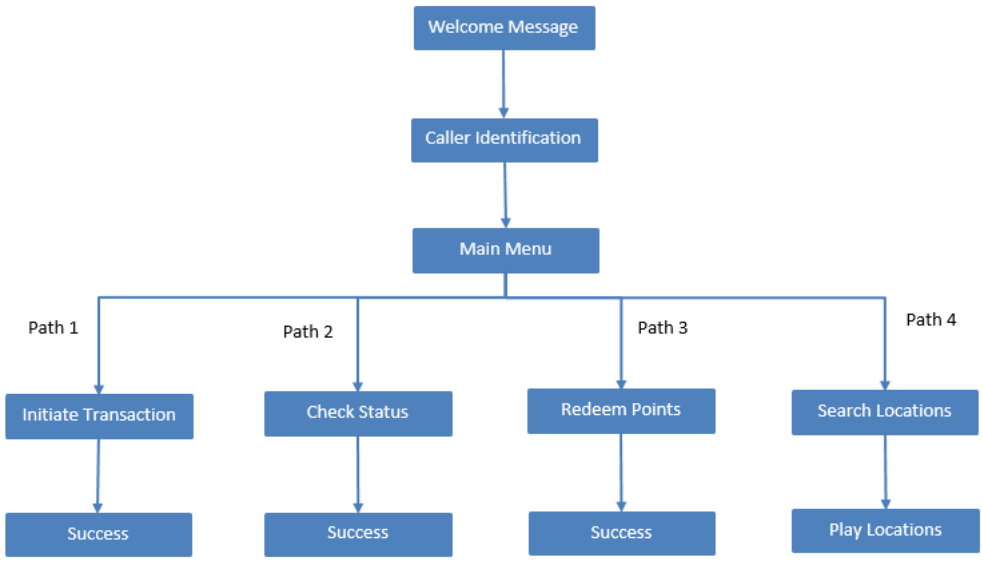

Figure 1. Different paths traversed inside IVR

DATA ANALYSIS

Problem Statement

West Corporation's leading financial services client offers multiple services to their customers such as initiating a transaction, checking status of transactions, redeeming of loyalty points and so on through IVR. Each of these routine tasks can be completed inside the IVR or with the help of live agents. When calls are completed successfully inside IVR they are categorized as Self Service calls, whereas, when calls are completed without accomplishing any task inside IVR or are transferred to agents, they are categorized as non-self-service calls. The basic objective of this paper is to understand how survey scores vary between self-service and non-self-service groups.

Data Overview and Extraction

Two different data sources are used in order to carry out this research I) IVR call logs II) External Client Survey Portal. Extraction of data from IVR call logs has been automated by CDS through SAS Macro facility. The macro helps to extract massive IVR transactional records on daily and hourly intervals. Survey data is extracted in csv format from client portal and ingested into SAS using INFILE statement. Once both datasets are available in SAS format, they are joined together using PROC SQL. Analysis is performed on one month of survey data.

```
/* SURVEY DATA INGESTION INTO SAS USING INFILE STATEMENT*/

OPTIONS COMPRESS=YES;
LIBNAME IVR '<PATH>';
FILENAME IN '<PATH>\SURVEY_SCORES.CSV';

DATA IVR.SURVEY_SCORES;
      INFILE IN DLM=',' DSD MISSOVER TERMSTR=CRLF FIRSTOBS=2;
      INFORMAT CALL_KEY $96.;
      INFORMAT IVR_QUESTION1 2.;
      INFORMAT IVR_QUESTION2 2.;
      INFORMAT IVR_QUESTION3 2.;
      INFORMAT IVR_QUESTION4 2.;
      INPUT CALL_KEY IVR_QUESTION1 IVR_QUESTION2 IVR_QUESTION3 IVR_QUESTION4;
RUN;

/* JOINING CALL LOGS WITH SURVEY DATA USING CALL KEYS*/

PROC SQL;
CREATE TABLE IVR.CALLS_AND_SCORES AS
    SELECT * FROM IVR.CALL_LOGS CALLS
    JOIN IVR.SURVEY_SCORES SCR
    ON CALLS.CALL_KEY=SCR.CALL_KEY;
QUIT;
```

Data Preparation

Once data is available in SAS dataset format using the above data extraction steps, further data preparation, cleaning and analysis are carried out using a combination of SAS DATA step and PROC SQL. Data is divided into 2 groups based on business understanding of IVR flow.

Group 1: Callers who accomplished self-service task inside IVR

```
/* PROC SQL USED FOR FORMING GROUPS */
/* FORMATION OF GROUP 1 */

PROC SQL;
CREATE TABLE IVR.GROUP1 AS
    SELECT * FROM IVR.CALLS_AND_SCORES
```

```
    WHERE CALL_TYPE ='SELF SERVICE';
QUIT;
```

Group 2: Callers who did not accomplish self-service task inside IVR, either they hung up or were transferred to live agents

```
/* FORMATION OF GROUP 2 */

PROC SQL;
CREATE TABLE IVR.GROUP2 AS
    SELECT * FROM IVR.CALLS_AND_SCORES
    WHERE CALL_TYPE <> 'SELF SERVICE';
QUIT;
```

Analysis performed by measuring Promoters and Detractors

Promoters - Customers rate the service provided by the company on a scale of 0-10. Customers who give a rating of 9 or 10 are highly satisfied with the service and would be willing to recommend the services to others. Such customers are referred to as promoters. Every organization's goal it to make their customers promoters. For this study, the hypothesis is that customers who self-serve are promoters i.e., they are likely to give a rating of 9 or 10.

Detractors - Customers who give a rating of 0 through 6 are not satisfied with the service and would not be willing to recommend the services to others or may even speak unfavorably about the brand. Such customers are referred to as detractors. Every organization's goal is to minimize their detractors. For this study, hypothesis is that customers who do not achieve self-service are more likely to be detractors or in other words likely to give a rating of 0 to 6.

```
/* CALCULATION OF PERCENTAGE OF PROMOTERS AND DETRACTORS IN GROUP 1 AND
GROUP2 */


PROC SQL;
CREATE TABLE IVR.CALCULATE_SCORES_GRP1 AS
SELECT COUNT(DISTINCT CALL_KEY) AS TOTAL_CALLS,
       COUNT(DISTINCT CASE WHEN RATING IN (9,10) THEN CALL_KEY END)
       AS PROMOTERS,
       COUNT(DISTINCT CASE WHEN RATING IN (0,1,2,3,4,5,6) THEN CALL_KEY END)
       AS DETRACTORS,
       CALCULATED PROMOTERS/CALCULATED TOTAL_CALLS
       AS PCNT_PROMOTERS FORMAT PERCENT8.2,
       CALCULATED DETRACTORS/CALCULATED TOTAL_CALLS
       AS PCNT_DETRACTORS FORMAT PERCENT8.2
FROM IVR.GROUP1;
QUIT;

PROC SQL;
CREATE TABLE IVR.CALCULATE_SCORES_GRP2 AS
SELECT COUNT(DISTINCT CALL_KEY) AS TOTAL_CALLS,
       COUNT(DISTINCT CASE WHEN RATING IN (9,10) THEN CALL_KEY END)
       AS PROMOTERS,
       COUNT(DISTINCT CASE WHEN RATING IN (0,1,2,3,4,5,6) THEN CALL_KEY END)
       AS DETRACTORS,
       CALCULATED PROMOTERS/CALCULATED TOTAL_CALLS
       AS PCNT_PROMOTERS FORMAT PERCENT8.2,
       CALCULATED DETRACTORS/CALCULATED TOTAL_CALLS
       AS PCNT_DETRACTORS FORMAT PERCENT8.2
FROM IVR.GROUP2;
QUIT;
```

RESULTS

The study was performed on two groups of customers - one who accomplished self-service task inside IVR vs group who did not accomplish. The analysis was carried out using SAS to understand percentage of Promoters and Detractors within these groups. Results clearly show that customers who achieved self-service (Group 1) are more likely to give 9 or 10 ratings over customers who did not achieve self-service (Group 2) for four IVR specific questions. On the other hand, customers who did not self-serve are more likely to give 0 to 6 ratings over customers who did achieved self-service for the same four IVR specific questions. Figure 2 shows percentage of promoters and detractors in group 1 and group 2.

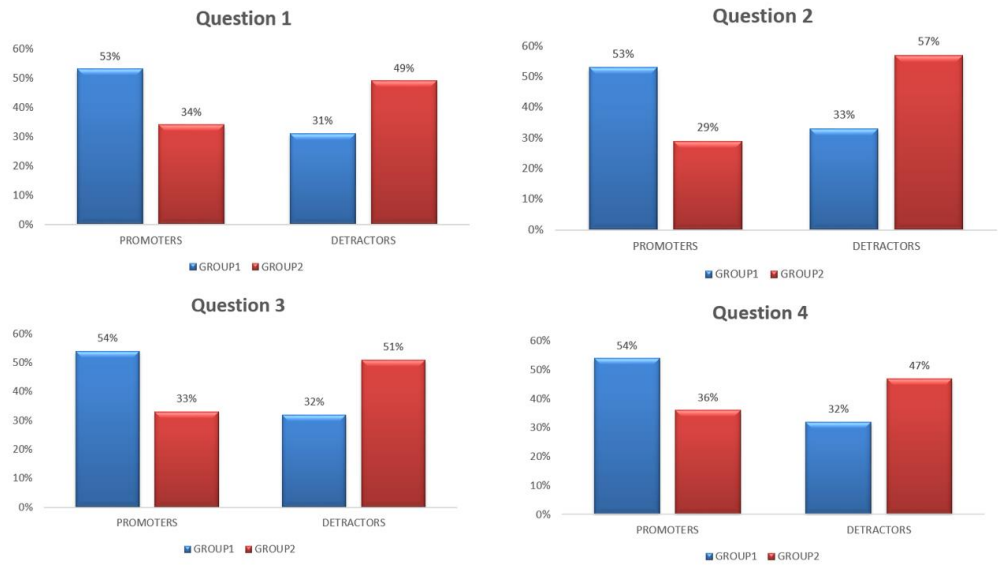

Figure 2. Ratings given by the customers for four IVR specific questions

Statistical test was performed using chi-square test between the groups to test the significance (for all four questions). Testing proved that there was a significant difference in the percentage of promoters and detractors in group 1 and group2 respectively. Figure 3 shows the statistical results of the chi-square tests carried out.

Question 1
Statistics for Table of Customer Type by Group

Statistic	DF	Value	Prob
Chi-Square	1	78.5417	<.0001
Likelihood Ratio Chi-Square	1	77.3335	<.0001
Continuity Adj. Chi-Square	1	77.5570	<.0001
Mantel-Haenszel Chi-Square	1	78.4921	<.0001
Phi Coefficient		0.2228	
Contingency Coefficient		0.2175	
Cramer's V		0.2228	

Question 2
Statistics for Table of Customer Type by Group

Statistic	DF	Value	Prob
Chi-Square	1	66.1153	<.0001
Likelihood Ratio Chi-Square	1	65.4113	<.0001
Continuity Adj. Chi-Square	1	65.2187	<.0001
Mantel-Haenszel Chi-Square	1	66.0732	<.0001
Phi Coefficient		0.2053	
Contingency Coefficient		0.2011	
Cramer's V		0.2053	

Question 3
Statistics for Table of Customer Type by Group

Statistic	DF	Value	Prob
Chi-Square	1	45.4454	<.0001
Likelihood Ratio Chi-Square	1	45.1698	<.0001
Continuity Adj. Chi-Square	1	44.7108	<.0001
Mantel-Haenszel Chi-Square	1	45.4165	<.0001
Phi Coefficient		0.1701	
Contingency Coefficient		0.1677	
Cramer's V		0.1701	

Question 4
Statistics for Table of Customer Type by Group

Statistic	DF	Value	Prob
Chi-Square	1	54.9006	<.0001
Likelihood Ratio Chi-Square	1	54.8558	<.0001
Continuity Adj. Chi-Square	1	54.0909	<.0001
Mantel-Haenszel Chi-Square	1	54.8650	<.0001
Phi Coefficient		0.1888	
Contingency Coefficient		0.1855	
Cramer's V		0.1888	

Figure 3. Results of chi-square tests

Group 2 which comprises of customers who did not self-serve inside IVR had traversed a wide variety of call paths. This analysis identified a group of customers who never participated in IVR and were nevertheless surveyed. Then these customers were recommended for exclusion from the survey, which improved the overall ratings by of 3%.

CONCLUSION

Measuring customer satisfaction is an important aspect in overall business improvement plans. The advantage of tying actual experience of the caller inside IVR to voice of the customer allows the business to pinpoint areas in the system that may be causing customer friction. Corrective action can then be taken in order to enhance customer experience. Moreover, survey data analysis also helps to discover a sampling error. Rectification of the sampling error lead to a more accurate view of the customer experience.

REFERENCES

Khots, Dmitriy. 2015. Unstructured Data Mining to Improve Customer Experience in Interactive Voice Response Systems. *Proceedings of the SAS Global Forum 2015*, Dallas, TX, SAS. Available at https://support.sas.com/resources/papers/proceedings15/3141-2015.pdf.

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