

ARBOT

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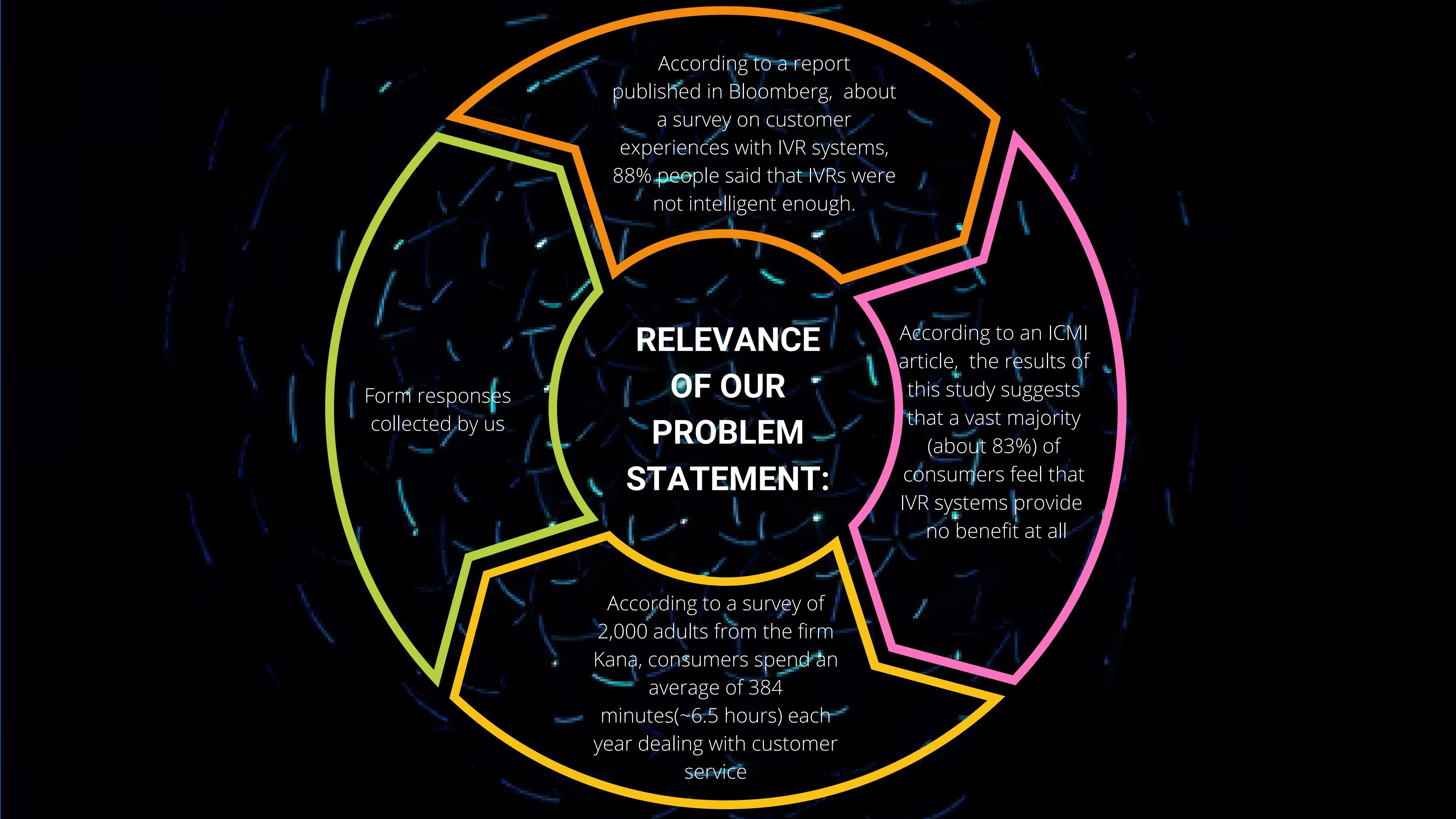
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PROBLEM STATEMENT:

Developing an interactive voice bot
for customer support services of
telecommunication companies





According to a report published in Bloomberg, about a survey on customer experiences with IVR systems, 88% people said that IVRs were not intelligent enough.

RELEVANCE OF OUR PROBLEM STATEMENT:

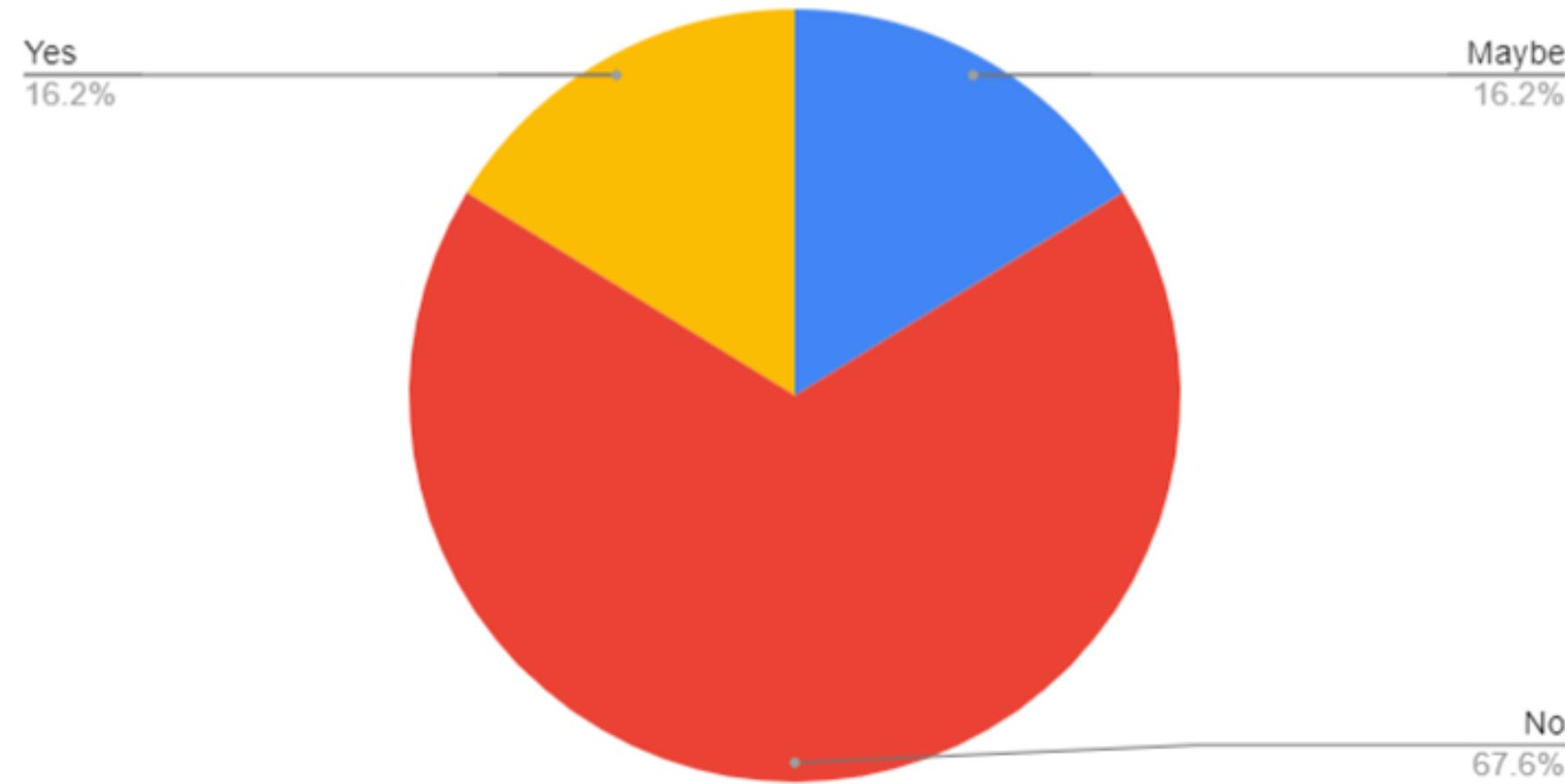
Form responses collected by us

According to a survey of 2,000 adults from the firm Kana, consumers spend an average of 384 minutes(~6.5 hours) each year dealing with customer service

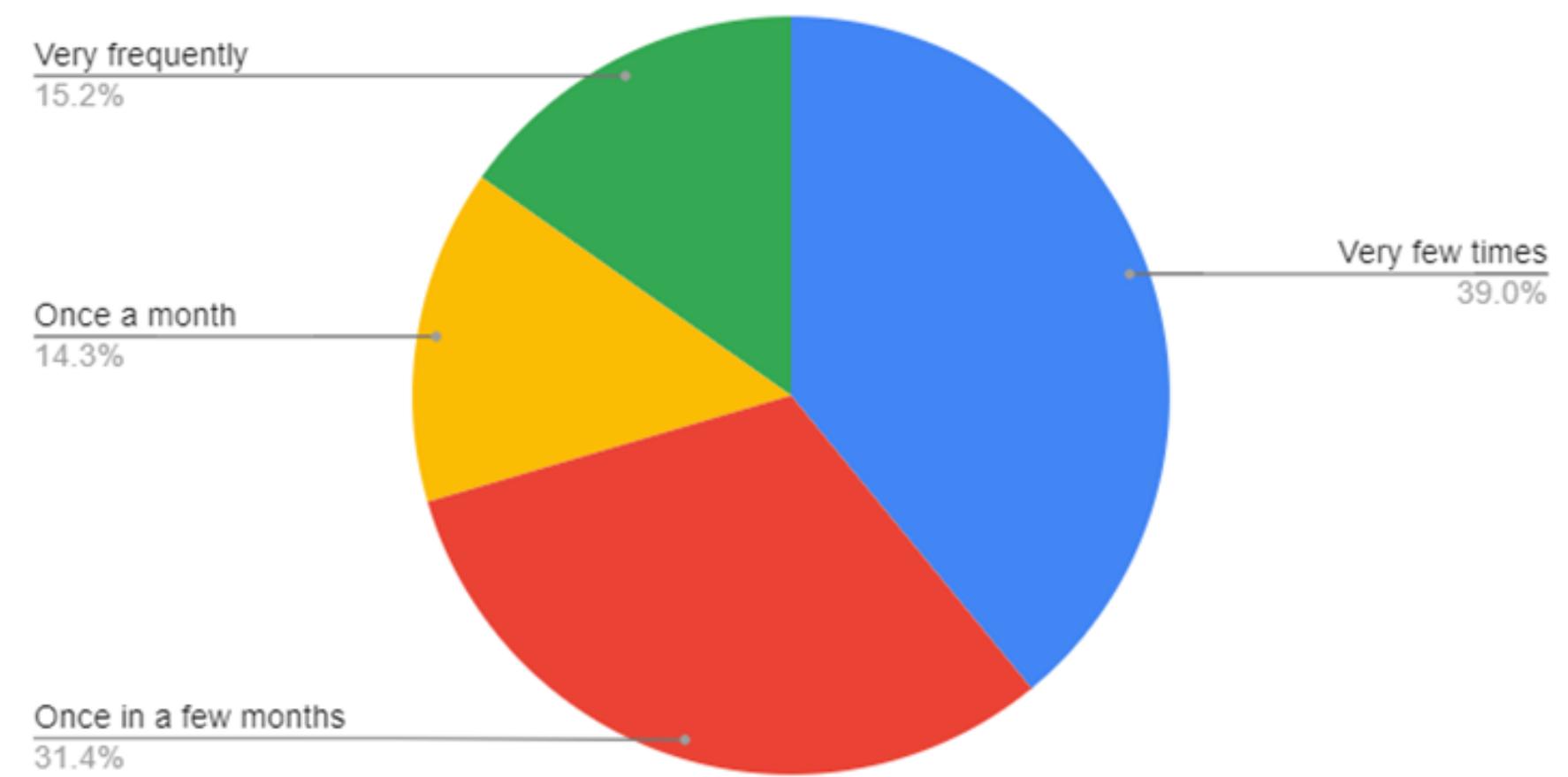
According to an ICMI article, the results of this study suggests that a vast majority (about 83%) of consumers feel that IVR systems provide no benefit at all

Responses from the survey

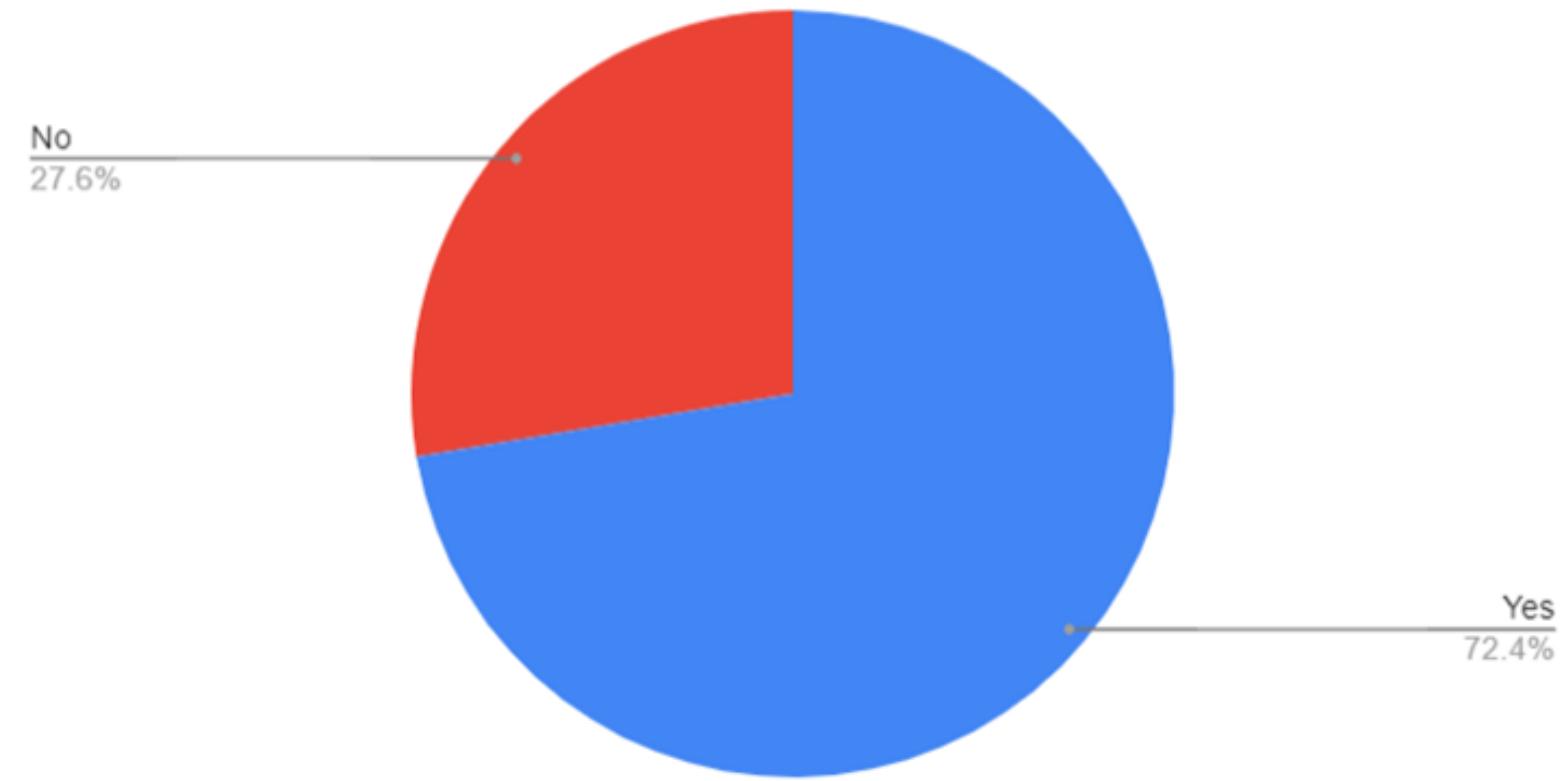
Count of Are you happy with the telecom customer care service?



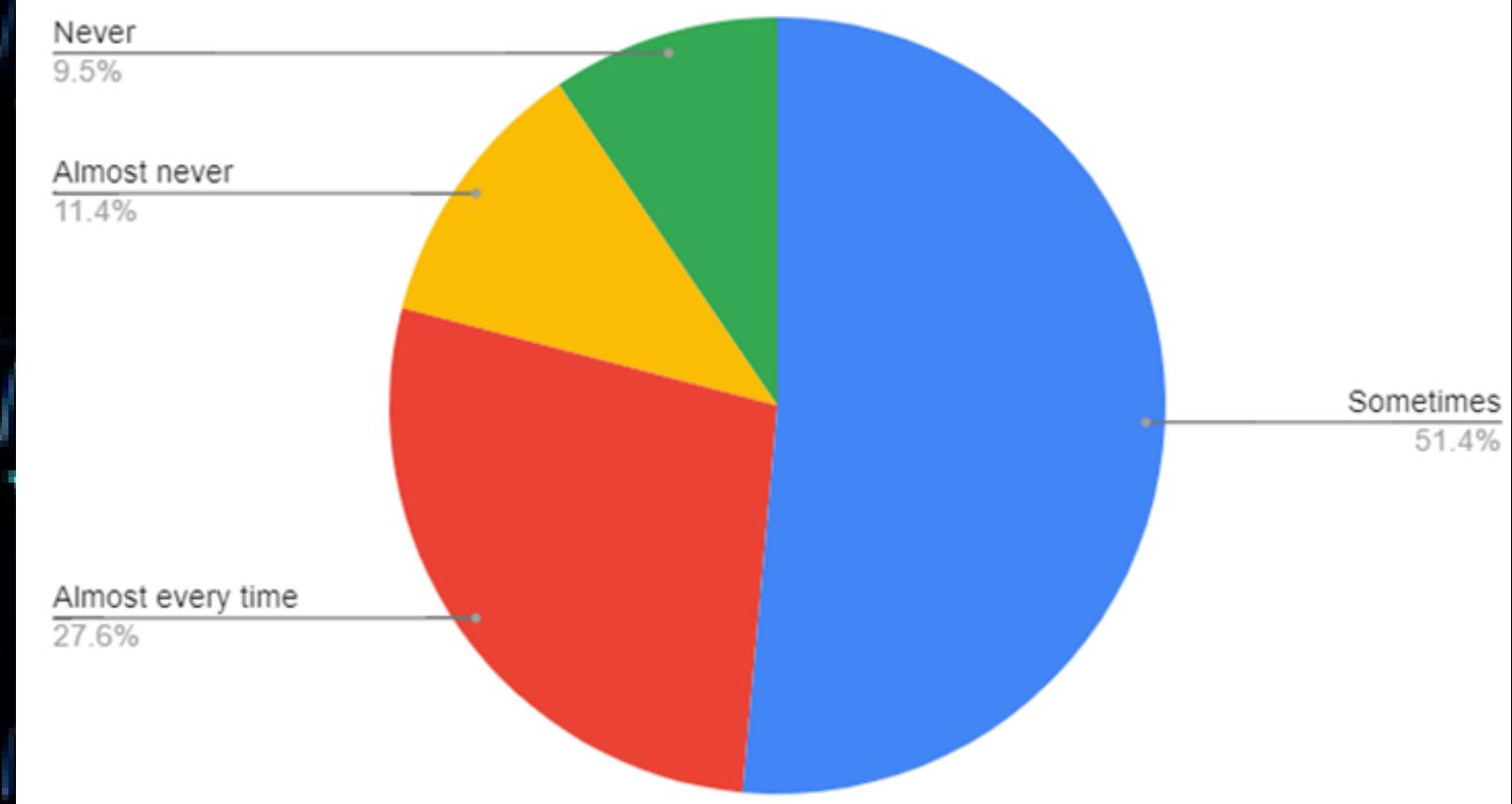
Count of How frequently have you contacted telecom customer care?



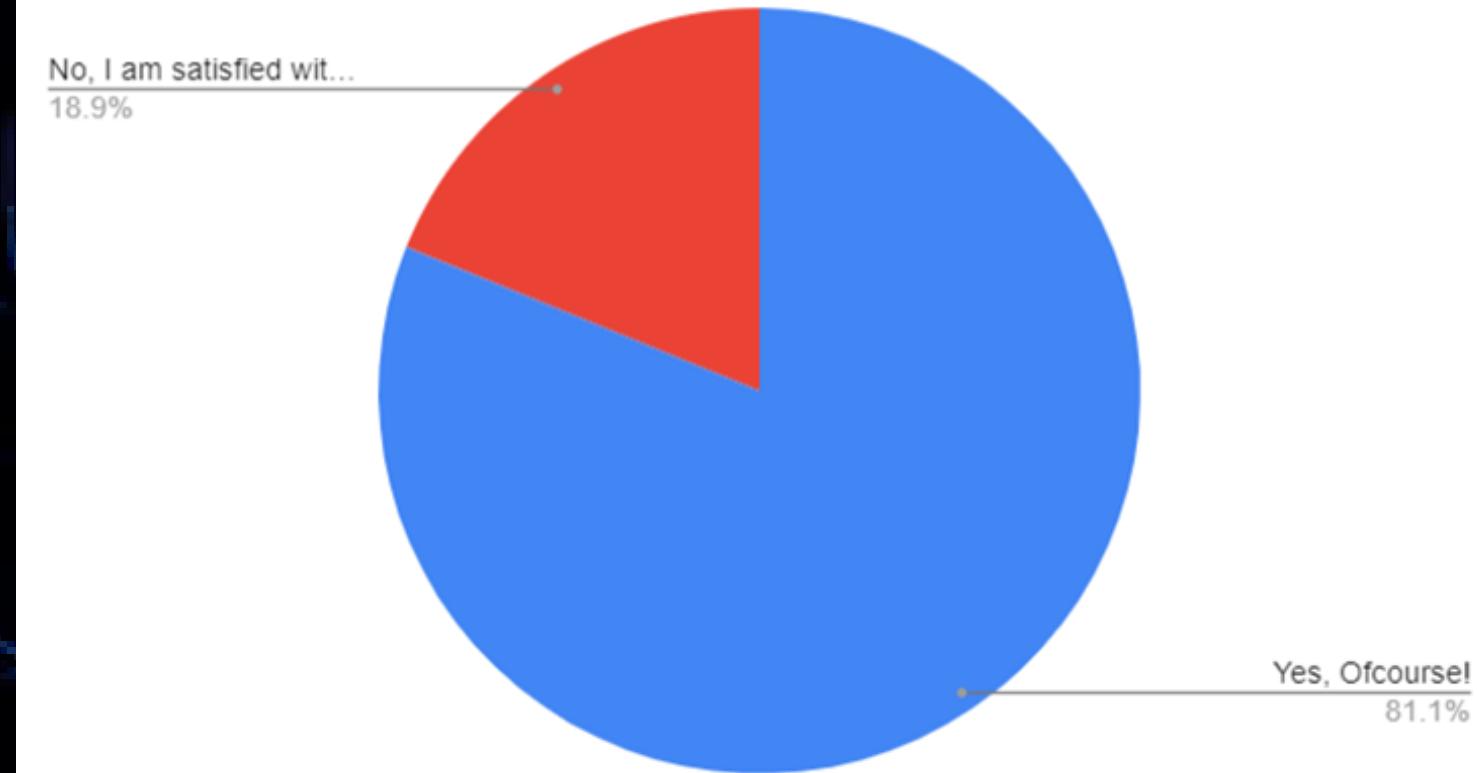
Count of Do you face call drops during the call and have to go through the numbered process again?



Count of On an average how many times do you face this?



Count of Would you be happier if there is a different system



Comments and suggestions from the Survey

- Number of towers should be increased
- Improve network coverage and call drop ratio. Need better narrow band frequencies within in-house premises. Congestion in network must be reduced
- Having the option to talk to a customer care executive in the first selection itself.

**SOLUTION
PROPOSED**

ARBOT

Bot asks what
the customer
wants?

User speaks in
natural
language.

The customer
receives the
support
without having
to go through
an array of
options.

Bot analyses
the speech
converted to
text for a
trigger word

Based on the
trigger word,
user is
channeled to his
desire service

OUR INNOVATION

- Integrating the features of a voice-based assistant to customer service in the telecom industry
- Using trigger-word detection/hot-word detection for predicting a user's desired service
- Examples of trigger words - Balance, Offers, Complaints, Customer agent, Callback
- A bidirectional network to take into account the order of the spoken words
- Saves much time wasted in listening to IVRs



**MARKET
OPPORTUNITY**

Further, if a call to customer support gets disconnected in between, one will again have to go through the same sequential options before they get their desired option.

Present Solution

This monotonous menu of options is largely time-consuming and leads to a poor customer experience. A majority of the callers dislike IVRs

Interactive Voice Response(IVR) was first introduced in 1962 and is still in use by many firms in their customer support systems.

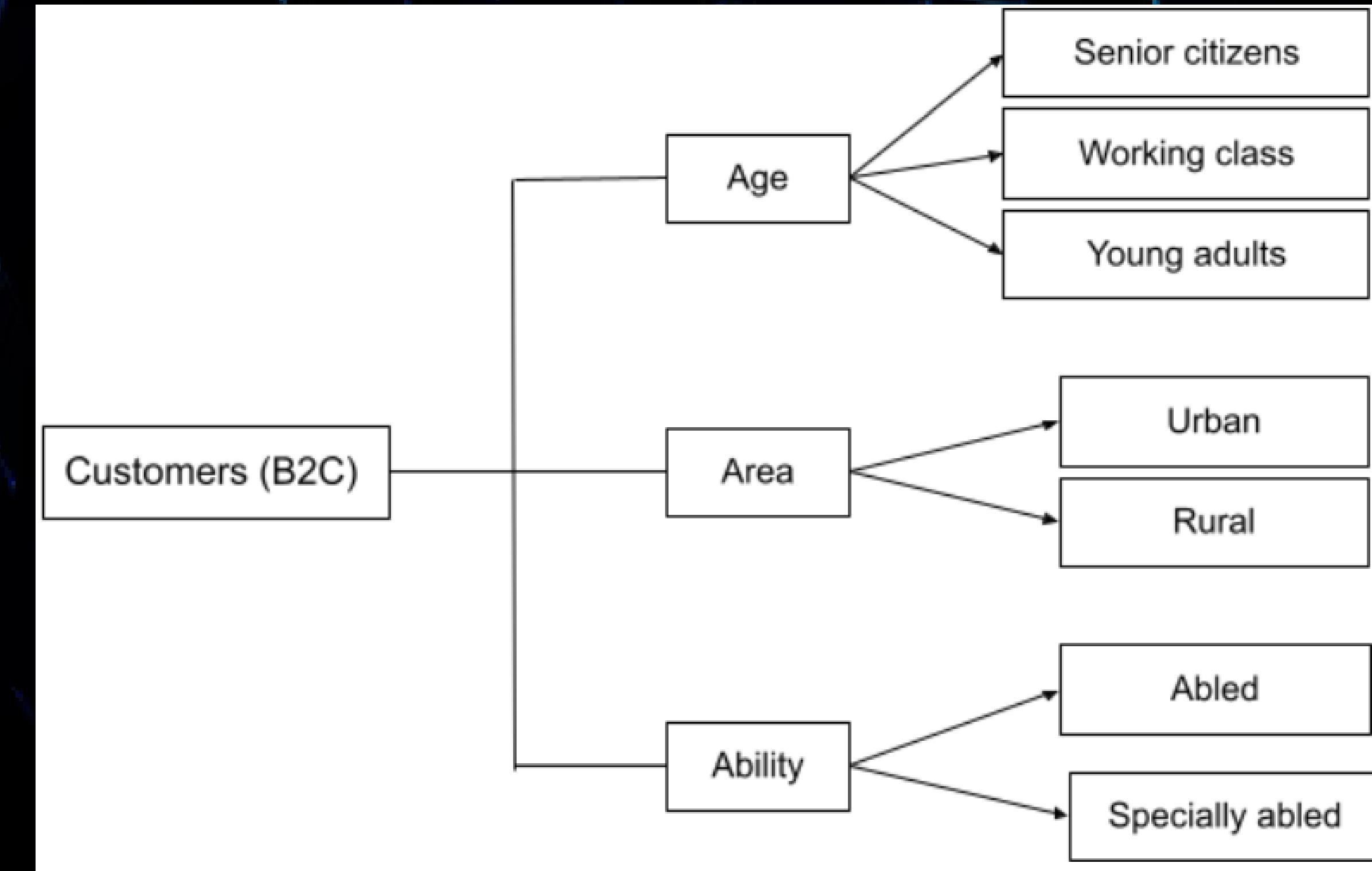
Comparing with the present solution

Solutions	B2B	Voice bot	Trigger word detection	Time saved	Subscription cost
Our Solution (ARBot)	1	1	1	1	18,900/-
Current Solution (IVRs)	1	0	0	0	20,000/-

Market Segmentation

- Telecom companies are the direct market for this product. This feature takes us into B2B segment.
- There are more than a billion mobile subscribers in India, mostly served by few major telecom companies.
- With increasing number of customers more customer care units are set up, which lead to the growth in the demand of IVRs.

Though the product is for the telecom customer care units, the indirect benefits will be availed by the customers. Hence we provide a market segmentation of our users as well.



SWOT Analysis

Strengths



- Faster response
- More efficient
- Customer satisfaction
- Ease of use

Opportunities



- Global IVR market is continuously growing
- Companies across domains, banking, e-commerce use IVRs



Weaknesses



- Slightly less accurate than IVR
- Training data needs to be prepared
- Domain-specific training data required

Threats



- Advanced chat bots
- Upcoming developments in textual NLP may lead to better chatbots which are simpler than our voice bot

Feasibility analysis

Operational feasibility.

Dataset needs to be prepared for initial training. Once trained, the bot can be used for months before fine-tuning is required.

Economic feasibility.

Our product is effective compared to the present IVR based customer care services and offers higher customer satisfaction at comparable cost.

Technical feasibility.

The present IVR deployment architecture can be easily used to deploy our bot and continue serving the end users for years, not requiring frequent maintenance



COST ANALYSIS

COST ANALYSIS

Research Cost

GPU Cost-
Rs.7500/-
(2 * P100
GPUs/month)

Resource Cost

Expected
Future Cost-
Rs.3750/-
(1*P100
GPUs/month)

Deployment
Cost-Rs.12000/-
(AWS Fargate for 5000
minutes/subscription)

Total Pricing

- Our product/unit costs us Rs.15750 for 5000 minutes of deployment
- With a 20% profit margin, we will be charging Rs.18,900/- for the telecommunication company for the service of 5000 minutes.
- The total initial investment would be Rs.3,22,500 for the deployment of 20 units.

Comparing with competitors

IBM Watson Assistant Enterprise

- Offers webchat, SMS service and messaging channel integrations as well
- Costs around INR 31897.95 for 5000 minutes of service
- Thus, with frugal engineering approach we have lowered the cost

Fund Plans

- Pradhan Mantri Mudra Yojana provides loans upto 10 lakhs with low interest rate.
- Moreover, we can also approach angel investors for funding.
- Negotiation with the telecom service providers in order to gain investments with 2 way benefits will also help to a great extent.

Team contributions

Problem statement & Relevance: Ankit, Raushan

Survey Form: Trisha

Solutions and Innovations: Rohan, Raushan, Deepu, Trisha, Ankit

Market Opportunitiy: Trisha

Similar Solution: Deepu

SWOT: Deepu, Raushan, Trisha, Oindrila

Feasiblity: Rohan, Raushan, Deepu

Cost Analysis: Ankit, Rohan

Fund: Ankit, Trisha

Ppt Making : Ankit, Raushan, Rohan, Deepu, Trisha

Relevant papers and resources used

- https://www.researchgate.net/publication/342174556_Trigger_Word_Recognition_using_LSTM
- <https://developers.google.com/assistant/howassistantworks/responses>
- <https://arxiv.org/pdf/2001.09519.pdf>
- https://www.researchgate.net/publication/348958473_Speech_Recognition_by_Simply_Fine-tuning_BERT
- <https://arxiv.org/pdf/2111.03971.pdf>
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**THANK
YOU!**