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Plotting the future of customer care through an effective Virtual Agent (VA) rollout strategy

Credits

Sathya Ramana Varri C

Sarvagya Nayak

Virtual agents not living up to the hype because of wrong deployments

2 out of 3 consumers prefer interaction with live agent over a VA

Virtual agents (VA) have been the next big thing in the market for the past few years and have shown huge potential for the future.
Zion market research suggests that the market of intelligent virtual agents is bound to reach

USD 19.6 Bn by 2025 growing at a CAGR of 35.4%

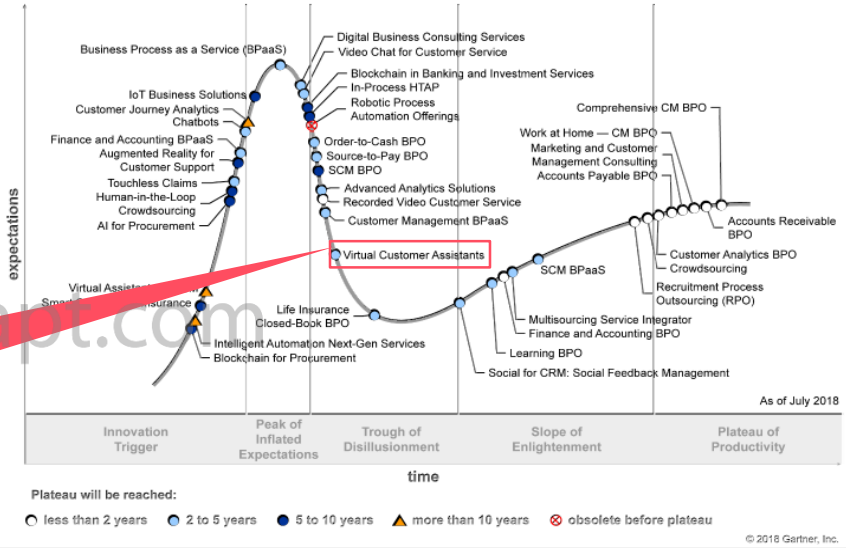
Forrester's report - Customer Chatbots Fail Consumers Today calls out:

- **2 out of 3 consumers** are skeptical of chatbots & their ability to provide just as great an interaction as a live representative
- **54%** of online consumers expect interaction with chatbots will negatively impact their quality of life

But Gartner's recent **Hype Cycle on Business Process Services 2018**, has placed VA in a **trough of disillusionment**. This is because:

- **VA implementations are failing** even though it has created a lot of interest and hype in the market
- They don't reach the desired confidence levels and capture correct customer intent, resulting in a poor response.

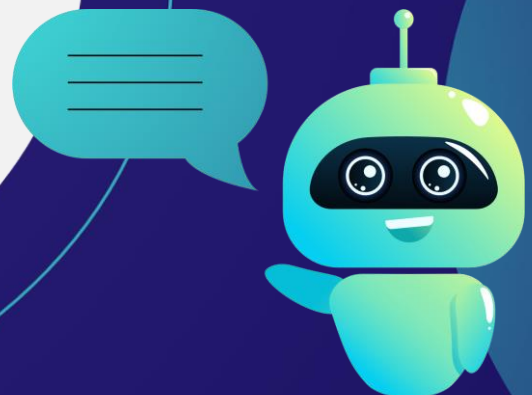
Figure 1. Hype Cycle for Business Process Services, 2018



This insight brings out the key strategy of VA rollout that can help **DSPs in containing their customers within VA interaction** and increase the overall customer satisfaction. It focuses on the major challenges that any DSP might face while rolling out VA and suggests solutions to address them.

Focus areas to consider for a successful VA rollout

1. Choosing the right use case for rollout
2. Analyzing complexity of intents
3. Considering variations in the intents
4. Designing the routing guide
5. Designing chat interface
6. Impact on customer experience
7. Throttling the traffic
8. NLU training time
9. Agent-driven rollout
10. Measuring performance



Choosing the right use cases for rollout – kickoff rollout with self-service flows

The inbound calls that DSP's call center receive can be categorized as customer service enquiries, technical troubleshooting or sales based

The use case that these calls invoke can be any one from the following:

Self-service Flows

Examples include:
- **FAQs** - Explain one-time fees
- **Product/service-related information** -How to change broadband speeds?
- **Questions on standard operating procedures** – How to add internet data plan?

Data-driven Information

Examples include:
- Provide unbilled voice usage
- What are the new promotions this month?
- Verify or provide wireless contract information

Transaction Services

Examples include:
- Enable international roaming
- Schedule a repair appointment
- Activate my new number

Recommendations

1. The Natural Language Understanding (NLU) models get trained eventually and the accuracy increases over time. Therefore, the **complexity of use case rolled out should increase gradually from**:

Self-service Flows
- Least complex
- VA mostly needs to **share publicly available web pages**

→

Data-driven Information
- Moderate complexity
- VA needs to **dip into databases and retrieve information**

→

Transaction Services
- Most complex
- VA needs to **dip into databases and make changes**

2. Train NLU model with varied intents to avoid overfitting or underfitting problems

3. Generate confusion matrix to measure the accuracy, precision and recall of NLU model

4. To improve
- **Precision** - train NLU model with **relevant intents**
- **Recall** - add more **training utterances**

Consider complexity of intents by analyzing the length of conversation and time taken by the agent to complete the conversation

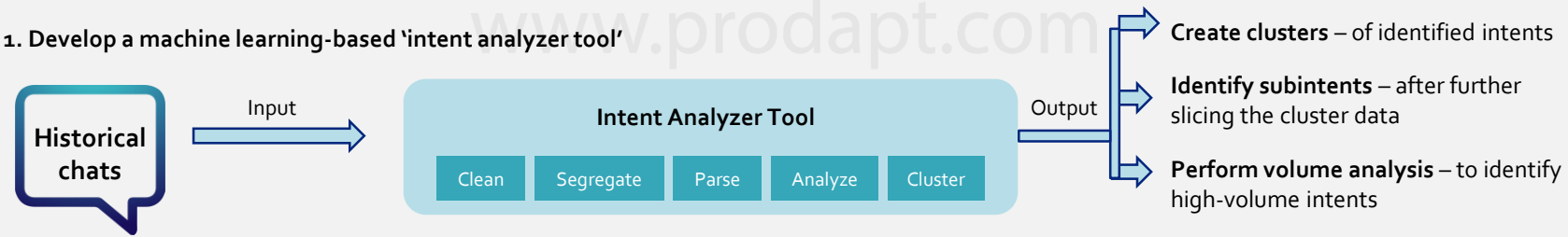
2 Analyzing complexity of intents

Understanding the complexity of intent is crucial for programming or training the VA. The complexity of intent can be assessed by:

- **Length of conversation -** by agent to complete the conversation
- **Average time taken -** by agent to complete the conversation
- **Hierarchy** - of intents and subintents. For e.g. the intent "Pay bill" can have hundreds of subintents spread across self-service, data-driven and transaction use cases

Recommendations

1. Develop a machine learning-based 'intent analyzer tool'



2. Kickoff rollout with high-volume and simple intents for quick ROI

One common observation across multiple VA implementations is 64% of conversations conclude within 6 messages including problem statement, diagnosis and resolution. It is recommended that conversations with less than 6 customer messages should be considered simple and greater to be considered as complex.

Consider variations of intents by analyzing its scope, lifecycle and precursor

3
Considering variations in the intents

From the clusters identified, representative examples are taken for training the NLU, which doesn't cover the entire scope of that intent.
It is recommended **to take examples from the cluster based on following criteria to holistically account all the variations of an intent across the spectrum. This improves containment by increasing precision and recall.**

Recommendations

Scope of Intent

Understand where the intent could be applicable within the scope of the service

Example - The intent of "Password reset" will have different treatment depending upon the service – customer account, voicemail, new registration etc.

"I am having issue in logging into my account"

"How do I reset voicemail password for my phone"

Intent Lifecycle

Understand and include variations from before, during and post scenarios for the intent.

Example - Password reset

Before scenario - Customer questions leading to intent

"I am trying to change my password and your system won't let me"
"trying to change my password and its not working - pls help"

During scenario - Customer questions arising while completing that intent

"it requires old password and i am typing it in and it says it doesn't like it"

After scenario - Understanding what could be follow through questions when a particular intent is not addressed or unsuccessful

"i am having issues logging into my account as you have already resent me my password but still not able to login"

Intent Precursor

Consider the reasons or background issues leading to that intent

Example - technical issues in the website or application could be responsible for intent

"i am having issue logging into the website. it just keep redirecting"

Introduce fine grained, context and customer data-based routing guide

4 Designing the routing guide

- Routing guide is **the first set of navigational options that VA** presents to the customer on the invocation
- Customers may not always know where to find the information they are interested in. Through a **series of qualifying questions,** users need to be routed to the relevant location

Recommendations

Present fine-grained options

i.e. the optimal number of questions which are neither too broad nor narrow

Based on customer account information

E.g. – if it is an existing only-broadband customer, throw questions relevant to that and not that of mobile subscription

Should not ask for login

When customer asks something before logging. E.g. – Customer asks his billing date before logging. The VA should throw template on "billing related issues" instead of "make payment" along with login option

Relevant to the context

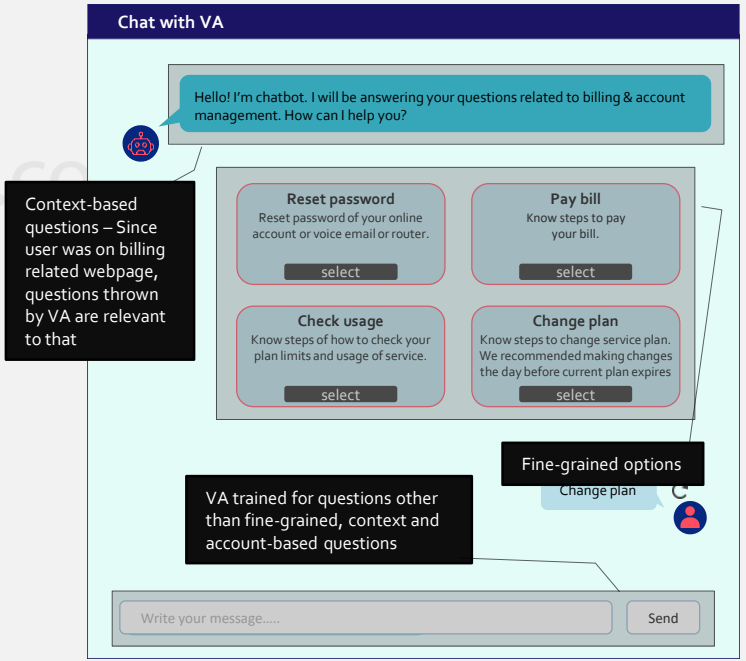
E.g.- If the customer is browsing enterprise products, ask questions relevant to only that

VA response flexibility

VA should be able to answer questions which customer asks outside of above-mentioned scenarios

VA should be trained for scenarios where

- Customer asks question even before being presented with options
- Customer replies with spelling mistakes
- It needs to transfer to live agent for intents which it is not trained for



Design a chat interface which minimizes strain on users and is also visually appealing

5 Designing chat interface

Chat interface with **UI components that are functionally and visually appealing,** enable and **enhance the conversation flow** between VA and users

Recommendations

Some recommendations on designing the chat interface are:

Minimizes ambiguity

- By providing UI components like date picker, radio options, lists, tree views
- Reduces back and forth messages

Improves chat containment

Enable visual response

- Reduces strain on user and burden of interpretation on NLU
- For e.g. Use of cards with images and icons

Reduces average handle time

Ability to undo & redo

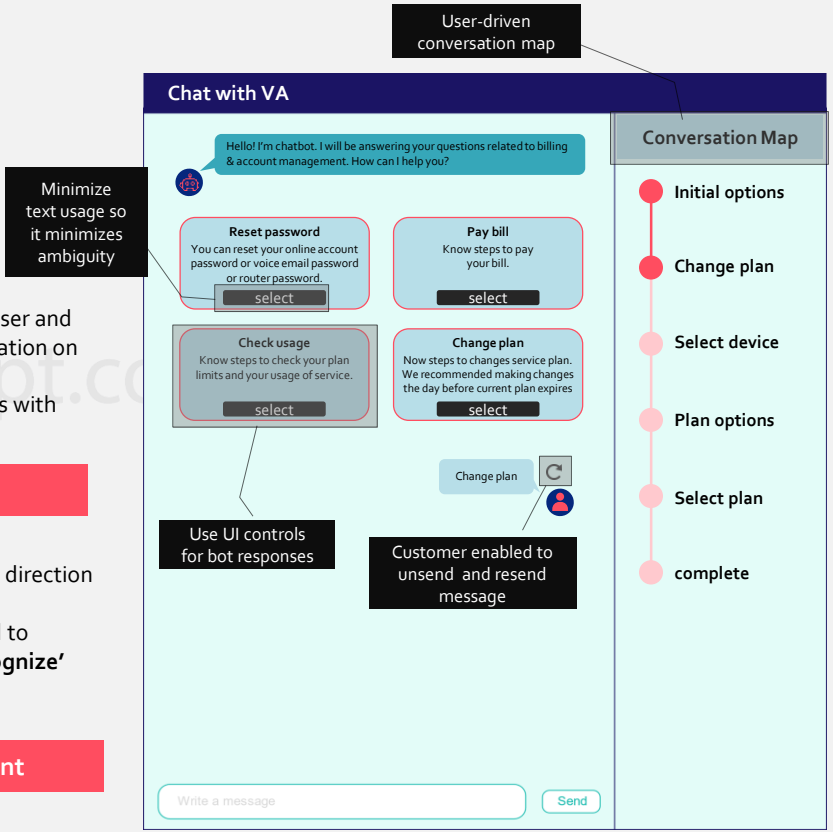
- VA builds context with every user response
- **To clear misinterpretation,** user should be given option of undo or resay a conversation

Improves customer engagement

Conversation route

- **Gives visibility** into direction of chat and goal
- Should be designed to enable user to **'recognize' instead of 'recall'**

Reduces customer abandonment

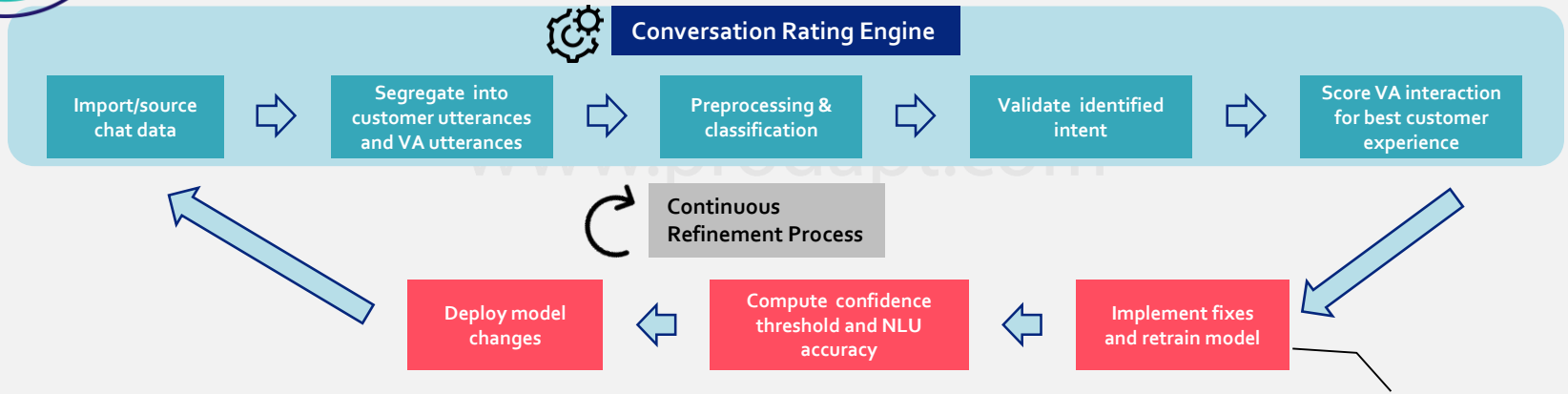


Continuously measure the impact of VA interaction on customer experience to improve its responses

6
Impact on customer experience

- Performance of VA depends on **performance of underlying model** which is dependent on training examples or training data.
- A mechanism should be in place to continuously monitor and improve NLU performance even before it's rolled out. Performing this task manually is not enough.
- Programmatic reviews – It provides review in real time and re-trains the model. Develop a "conversation rating engine" to review high volume of VA chats.

Programmatic reviewing and re-training



Conversation rating engine can:

- Improve NLU intent classification confidence by **2-4% weekly**
- Review **200K chats per day**
- Score the chats on the **scale of 1-10** (1- worst, 10 – best)

Define criteria to programmatically score interaction for best customer experience

- Number of attempts to disambiguate
- Recognizing customer responses other than provided options
- Time to respond
- Accuracy in transferring to live agent
- Treatment of out of scope intents
- Number of looped responses

Throttling of traffic to minimize negative impact on customer experience

It is important to decide the **proportion of customer chat traffic** that would be diverted to VA while rolling out. In the early stages of rollout, the **VA containment will be low.** i.e., most of the conversations **will be diverted to live agents** by VA.

Recommendations

Key aspects to consider are:

Off-business hours

Start the rollout in off-business hours to take advantage of relatively less traffic, **optimizing limited customer exposure**

Activation logic

- It **defines when will chat pop-up** for customer
  In the initial days **keep this logic same as that of manual agent**

Start small

In the initial days of rollout, **divert small traffic to VA**

Agent-driven rollout

- **Launch** VA in agent-driven mode
- **Increase the traffic** when VA accuracy increases

Agent availability

Plan for all scenarios when VA invokes agent and:

- Agent is available
- Agent is not available
  - in business hours
  - In non-business hours

Providing adequate training time is paramount to increase NLU's response effectiveness

8
NLU Training time

It is necessary to provide **enough training time** to expose NLU to highly varied human conversations. It is rare to see **single- digit containment efficiency** in the first few weeks of VA rollout.

Recommendations

VA learning can be accelerated by focusing on few key aspects such as:

Retrain
to **remove confusion** between existing intents

Correct
Intent errors
- **Overlapping intents**
- **High-recall intents**
- **Low-precision intents**

Add
- New intents
- Out-of-scope intents

Add training to
- Improve **precision**
- Confused intents – to **clarify their boundaries**

Regularly monitor
NLU threshold confidence – by plotting intent confidence vs error graph

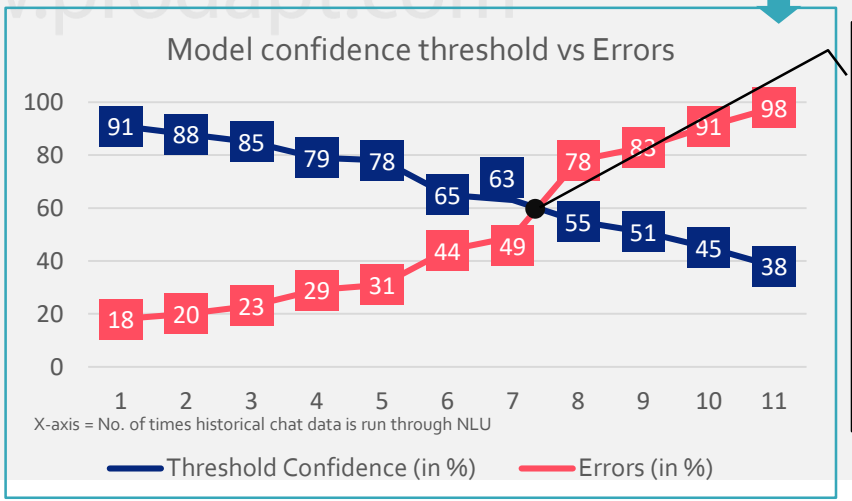
Combine
Confused intents and distinguish using entities

- At **high confidence threshold,** VA will be able to take very few chats
- At **low threshold,** errors will be high

To **find out optimal confidence level** – run the historical chat multiple times with NLU at different confidence thresholds

Plot the graph between configured confidence and corresponding error

The intersection point of 2 variables is the 'optimal confidence level'



Optimal confidence threshold at which
- VA will find balance between model confidence and error rate
- Optimal amount of chat traffic is handled by VA at acceptable error rate

Perform agent-driven rollout to give on-the-job training to the VA without negatively impacting customer experience

9
Agent-driven rollout

Conventional rollout approach

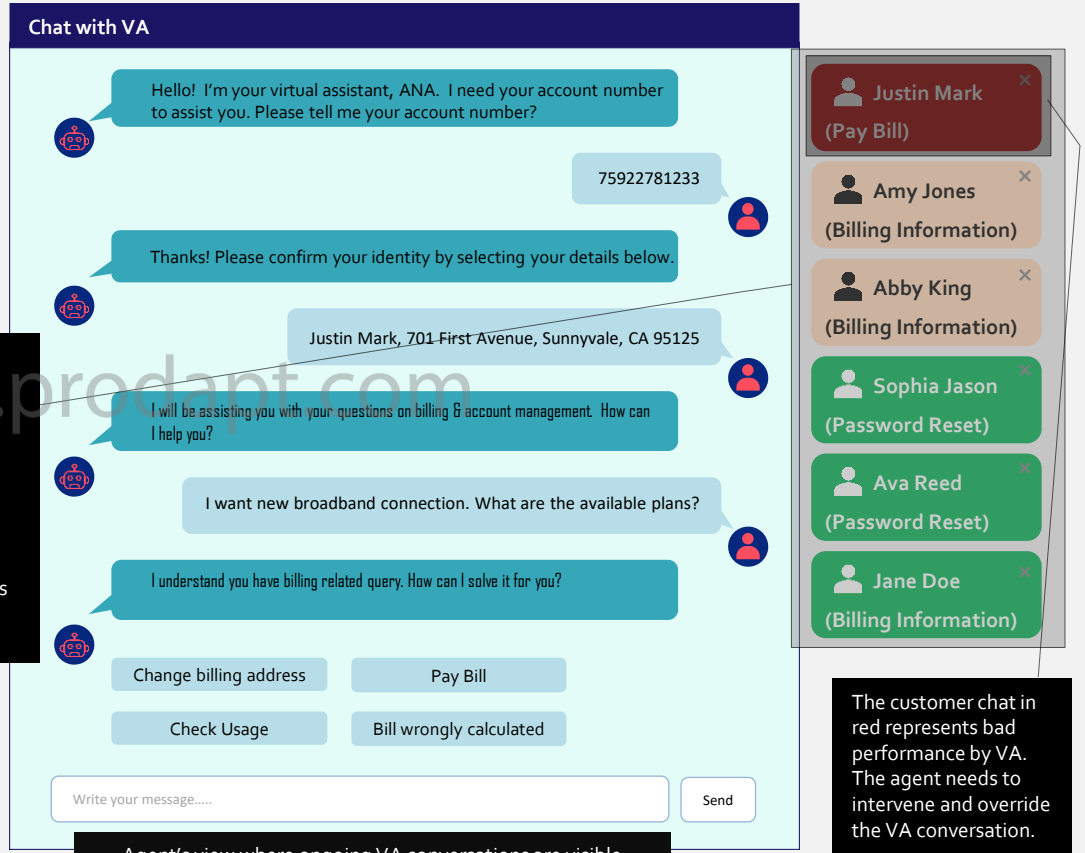
- VA deployed directly to face customer questions after the training
- It may still have a high-error rate in the initial stages

Recommendation

Agent-driven rollout

- In this mode, **the live agent can observe and alter, if needed, the responses coming from NLU**. While doing so, not only the customer has to face delayed/wrong responses, but the NLU also gets trained.
- Eventually, this should advance to a stage where the agent is observing multiple chats and intervening only in the cases of escalation.

- All the VA chats that a live agent is overseeing at a point in time
- **The performance of the chats is measured in real-time.**
- Gradient colored escalation ladder is created based on the rating



Agent's view where ongoing VA conversations are visible

The customer chat in red represents bad performance by VA. The agent needs to intervene and override the VA conversation.

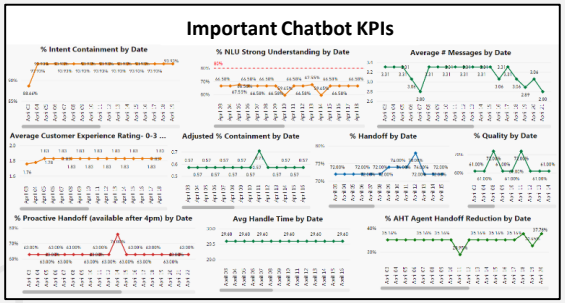
Measuring performance – technical, qualitative and business related for holistic improvement

10
Measuring performance

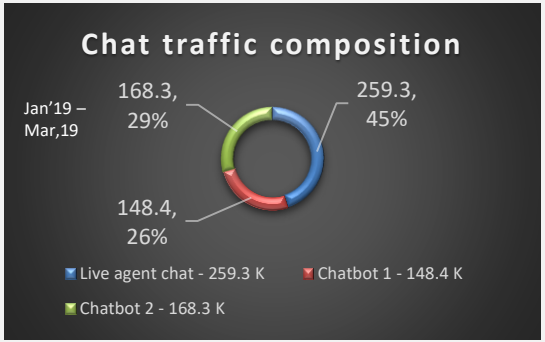
A metrics dashboard should be implemented to provide **VA key performance indicators** and other **strategic data at a glance**. It should include **three types of metrics – system/technical, quality and business,** providing a holistic view into VA state.

Type	Performance Indicator Definition	Recommended goal for 1st quarter of rollout	Achieved
Technical	System availability /Uptime	99.99	95
	Avg VA response time (Milliseconds)	450-550	500
Quality	% NPS given	8-12%	5%
	Positive sentiment swing at the beginning and end of the interaction	9-11%	9%
	Avg customer wait time	<0.1 %	0.50%
	Avg. number of messages	17-19	17
Business	VA contained contacts	31-35%	29%
	Contacts transferred to live agent (%)	43-47%	45%
	Customer abandonments	18-22%	25%
	Reduction in live agent AHT	11-14%	11%
	Increase in user volume	25-35%	25%

Ideal/recommended goal for 1st quarter – practical and not over-ambitious



A sample dashboard measuring VA KPIs



45% of chats transferred to live agent by VA

A sample report generated by the dashboard. It highlights which KPIs are within the recommended range and which are out of it.

Key takeaways

Customer experience

Over a period of 6 months

- **17% increase** in NPS & CSAT scores expected
- **18% increase** in survey response expected

Containment within VA chats

32% increase can be achieved within 10 weeks of rollout

Average handling time

12% reduction **expected** in comparison to manual chats over 6 months

Shorter conversations

13% reduction can be achieved in number of conversation lines over 6 months

Get in touch

USA

Prodapt North America
Tualatin: 7565 SW Mohawk St.,
Phone: +1 503 636 3737

Dallas: 1333, Corporate Dr., Suite 101, Irving
Phone: +1 972 201 9009

New York: 1 Bridge Street, Irvington
Phone: +1 646 403 8161

CANADA

Prodapt Canada Inc.
Vancouver: 777, Hornby Street,
Suite 600, BC V6Z 1S4
Phone: +1 503 210 0107

UK

Prodapt (UK) Limited
Reading: Davidson House,
The Forbury, RG1 3EU
Phone: +44 (0) 11 8900 1068

EUROPE

Prodapt Solutions Europe
Amsterdam: Zekeringstraat 17A, 1014 BM
Phone: +31 (0) 20 4895711

Prodapt Consulting BV
Rijswijk: De Bruyn Kopsstraat 14
Phone: +31 (0) 70 4140722

Prodapt Germany GmbH
Münich: Brienner Straße, 80333
Phone: +31 (0) 70 4140722

Prodapt Switzerland GmbH
Zürich: In Gründung, 8008

SOUTH AFRICA

Prodapt SA (Pty) Ltd.
Johannesburg: No. 3,
3rd Avenue, Rivonia
Phone: +27 (0) 11 259 4000

INDIA

Prodapt Solutions Pvt. Ltd.
Chennai: Prince Infocity II, OMR
Phone: +91 44 4903 3000

"Chennai One" SEZ, Thoraipakkam
Phone: +91 44 4230 2300

IIT Madras Research Park II,
3rd floor, Kanagam Road, Taramani
Phone: +91 44 4903 3020

Bangalore: "CareerNet Campus"
2nd floor, No. 53, Devarabisana Halli,
Phone: +91 80 4655 7008

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insights@prodapt.com | www.prodapt.com

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