

PMaps eVA[™] Assessment

A White paper on overall accuracy

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PMaps eVA™ Assessment ACHIEVES STANDARDIZATION OF VOICE EVALUATION PROCESS; WITH OVERALL ACCURACY OF 89%

1. Synopsis – High Reliability for PMaps eVA™ Assessments™

Benchmarking study with biggest Indian Telecom Player showed that PMaps eVA™ Assessment could identify candidates with good spoken English when benchmarked against the evaluation performed by Voice and Accent trainers, with an overall accuracy of 89%. PMaps eVA™ Assessment measures customer centricity of contact centre staff by assessing reading, speaking, writing & solutioning approach, further subdivided across sub-traits such as grammar, vocabulary, fluency, context, comprehension, etc. as measured manually by these trainers.

878 applicants from one of India’s leading Telecom player were administered under PMaps eVA™ Assessment for the voice process, a web-based spoken English + customer centricity evaluation tool. These applicants were also manually evaluated for spoken English skills by the Voice and accent trainers of the organization on multiple spoken English evaluation parameters. The candidates were also given a total score by the trainers, which was a function of scores in these parameters coupled with a few 'fatal errors' made by the candidate. The Voice and Accent trainers were based in a centralized assessment centre, whereas the hiring happened pan India.

To establish meritocracy of the tool, we have compiled confusion matrix to compute the test of association between PMaps eVA™ Assessment and manual scores assigned by Voice and Accent trainers as mentioned below. The overall accuracy of the tool stands at 89% with Chi value: 12.34 and P-Value: .0009 (<.01- the level of significance) giving AUC .89

Manual Evaluation	PMaps eVA™ Assessment		N
	Good	Bad	
Good	474	53	527
Bad	49	302	351
Overall	523	355	878

Figure 1 Confusion Matrix

Error % stands at $(49+53/878)$ i.e. 11% at candidate throughput (i.e. Passing %) of 60%.

As exhibited above, PMaps eVA™ Assessment cut-offs used for the applicants showed that the candidates identified as good for voice profile from manual evaluation by the Voice and Accent trainers, PMaps eVA™ Assessment also identified 89% of these candidates as good. Thus, false rejects (losing out on good candidates) was well within 11%. Also, from the candidates identified as not good for voice evaluation, 86% were rejected by PMaps eVA™ Assessment. PMaps eVA™ Assessment provided evidence that it could increase operational efficiency significantly by reducing the load on Voice and Accent evaluators when used prior to manual evaluation.

2. Test Construct

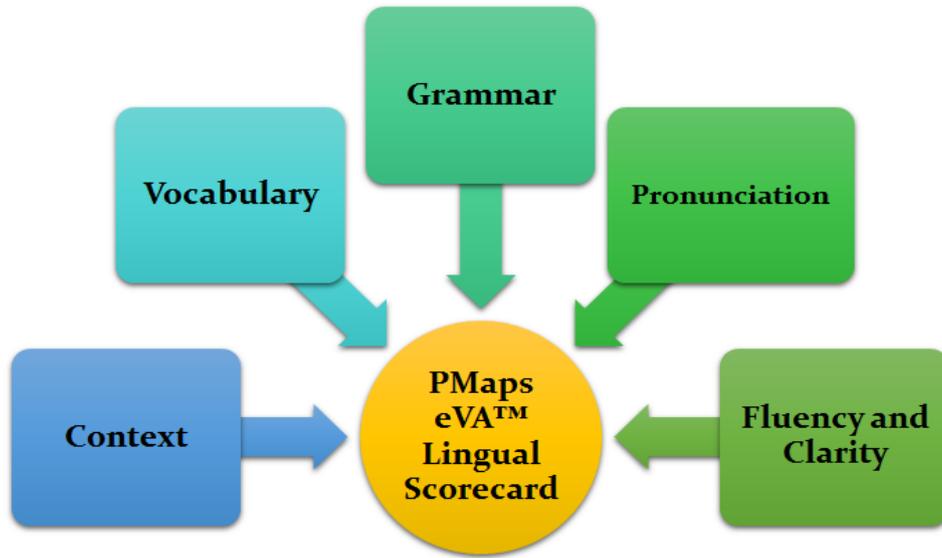


Figure 2 eVA™ Lingual Scorecard

The **PMaps eVA™ Assessment** intends to measure spoken English along with the solutioning capability. Spoken language plays a very important role during any kind of verbal communication. This is the ability to understand spoken English and to respond appropriately in an intellectual way. In order to achieve successful oral communication, the user should be able to understand the language on what is being said, extract the meaning as speech continues and built relevant responses in real time. The PMaps eVA™ Assessment administers a user in broadly four aspects – reading, speaking, writing and solutioning approach via web-based assessment.

3. Test Competencies

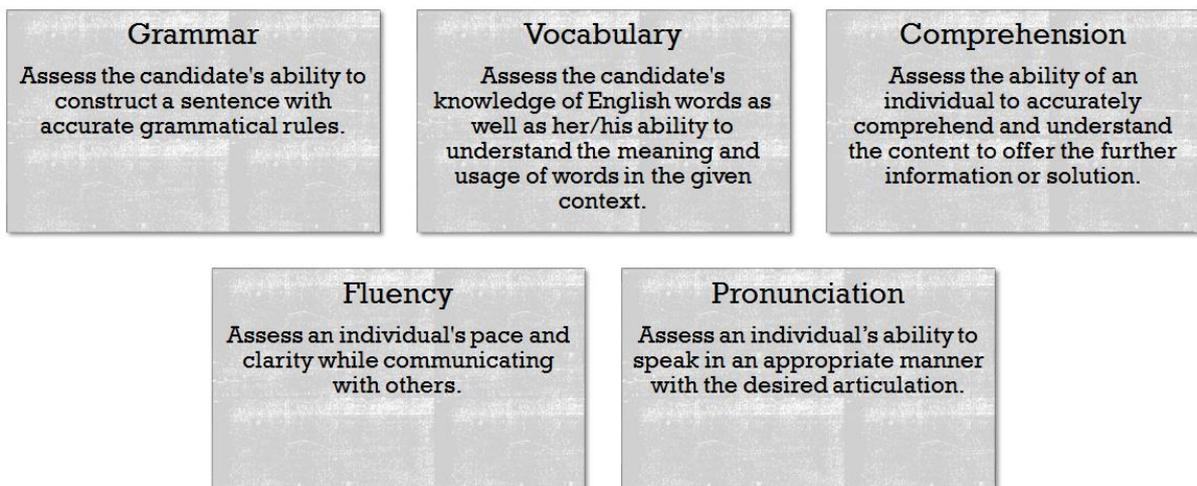


Figure 3 Traits Measured

3.1 Listening and Written Comprehension:

The “Listen and comprehend” items require real-time receptive and processing of spoken language. It measures the basic encoding and decoding of oral language. It assesses the ability of the user to articulate and built phrases basis the understanding of the language.

How? – An audio clip will be played. The user needs to listen to this audio carefully and type their own understanding of the customer’s query provided in the audio.

What is checked? – Spelling, Grammar, and Context

3.2 Listening and Spoken Comprehension:

The “Say it Loud” section also requires real-time receptive and processing of spoken language. A speech recognition software is used to measure the user's voice along with accent. It assesses if the user can understand the query provided in the audio and can communicate it back with the system.

How? - The user needs to listen to the audio clip carefully and record their own understanding of the customer’s query provided in the audio in their own voice.

What is checked? – Grammar, Context, Fluency, and Pronunciation

3.3 Solutioning Approach:

The “Solve to resolve” section, measures the ability of the user to think and provide a viable solution with the help of information provided in the form of a media or text.

It assesses whether the user can provide a spoken solution to the query mentioned in the audio clip.

How? – The user must carefully listen to an audio clip, which is in the form of a query, comprehend and understand the query, and needs to record the solution with the additional information given in support to the question and provide an appropriate response.

What is checked? – Grammar, Context, and Pronunciation

4. eVA Engine

The core architecture of the PMaps eVA™ Assessment engine consists of an in-house developed **ML** (Machine Learning) **Model**. We are also consuming a few commercially available state-of-the-art models to improve the overall accuracy of the product. We have incorporated two different techniques, namely, **ASR** (Automatic Speech Recognition) and **NLP** (Natural Language Processing) for analyzing the user’s vocal and lingual skills.



Figure 4 eVA™ Engine

The ASR technique enables to assess the vocal parameters of the user and by the NLP technique, we can analyze the level of context matched with the correct responses stored in the system. We have built our own unique proprietary algorithm for the contextual analysis.

4.1 ASR Model

In order to assess efficient speaker - the user should possess a clear voice, proper diction and should be able to pronounce words appropriately. So, we have integrated our system with a state-of-the-art speech recognition technique which provides an accuracy of more than 95% in identifying the spoken language. We are also able to analyze other aspects of the voice such as pitch, tone, rate of speech, etc.

The ASR model was created using around 20,000 different utterances in an Indian-English accent. The classification of the audio files was avoided to prevent any bias that may arise through classification.

4.2 NLP Model

The NLP model is developed to work as an independent model. The model can be used to evaluate any written or verbal communication (by using input from an ASR tool). The most important functionality provided by this model is to assess the user’s lingual skills. The model is embedded with a vocabulary/grammar check library which returns the number of grammar and vocabulary errors made by the user.

The context accuracy is checked by matching the response that is received from the user to various predefined expected output feed into the system. We are using a version of the TF-IDF (Term Frequency-Inverse Document Frequency) and word-sentence association to calculate the context accuracy.

The calculation of the lingual scorecard is based on the combination of vocabulary, grammar and the context rating of the input data where higher weightage is provided to the context. Also, the system is dynamic enough to implement any change in the above rating.