

## Project Design Phase-I Solution Architecture

Date	29 September 2022
Team ID	PNT2022TMID08567
Project Name	Project - Detecting Parkinson's Disease using Machine Learning
Maximum Marks	4 Marks

### Solution Architecture:

Solution architecture is a complex process – with many sub-processes – that bridges the gap between business problems and technology solutions. Its goals are to:

- Find the best tech solution to solve existing business problems.
- Describe the structure, characteristics, behavior, and other aspects of the software to project stakeholders.
- Define features, development phases, and solution requirements.
- Provide specifications according to which the solution is defined, managed, and delivered.

### Example - Solution Architecture Diagram:

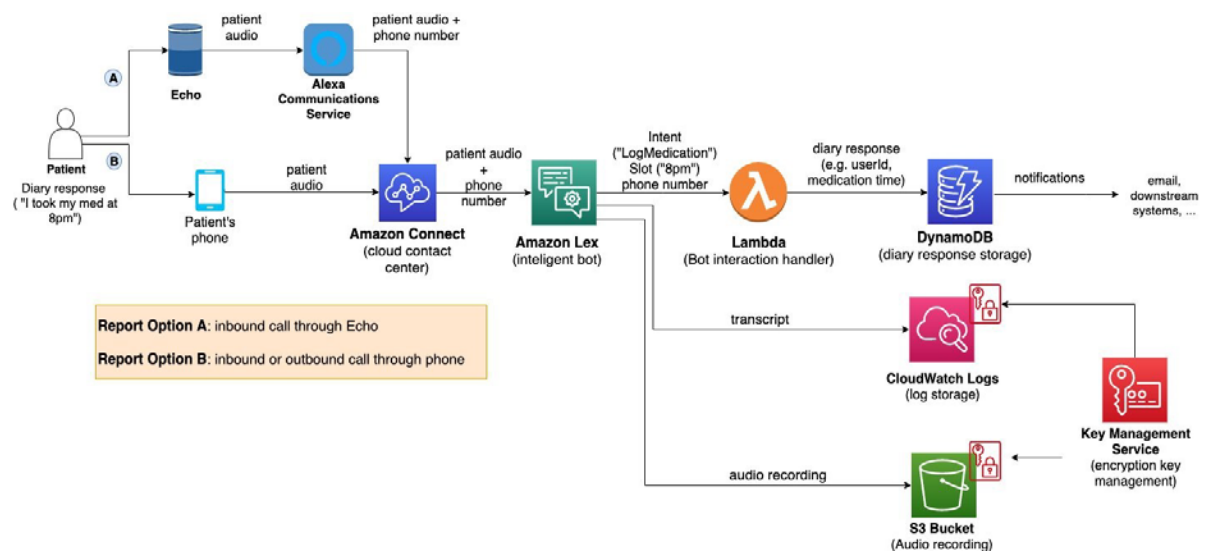


Figure 1: Architecture and data flow of the voice patient diary sample application

Reference: <https://aws.amazon.com/blogs/industries/voice-applications-in-clinical-research-powered-by-ai-on-aws-part-1-architecture-and-design-considerations/>

## SOLUTION ARCHITECTURE:

The spiral wave test is conducted on patients. The result of the spiral wave test i.e., images of spirals and waves drawn by patients are obtained. These images are analysed by using Histogram of Oriented Gradients (HOG), Machine Learning and OpenCV and a diagnosis is given. Random Forest Classifier is used for the spiral images in the dataset and KNN for Wave images along with Histogram of Oriented Gradients (HOG) for quantifying the images before training. Pre processing of the images includes the following steps:

- Resizing every image to  $200 \times 200$  pixels from the input images of random sizes
- Converting each image from RGB to GrayScale to have a single channel
- Thresholding the image so that it appears as white on a black background for better feature extraction
- After this, HOG will be used to extract features from the images
- For Spiral : RandomForestClassifier will be used for fitting &  
For Wave : KNeighborsClassifier will be used.



## Solution Architecture

