

# **Project Design Phase-I**

## **Problem – Solution Fit**

Date	24 September 2022
Team ID	PNT2022TMID52690
Project Name	Detecting Parkinsons Disease Using Machine Learning

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### **PROBLEM STATEMENT:**

Parkinson's disease (PD) is a chronic, progressive neurodegenerative ailment that begins with injury to a specific region of the brain. One in every 500 people is affected by Parkinson's disease. Most patients with Parkinson's disease have symptoms after the age of 50, with one in every twenty developing symptoms before the age of 40. .Early detection of Parkinson's disease is critical for patient survival.

# Problem-Solution fit canvas 2.0

To understand the solution proposed in coherence to the problem statement

Define CS, fit into CC	<b>1. CUSTOMER SEGMENT(S)</b> <b>CS</b> <ul style="list-style-type: none"> <li>Persons with symptoms of Parkinson's disease.</li> <li>Senior citizens who are under high-risk zone of getting the condition.</li> <li>Doctors wanting to perform preliminary analysis</li> </ul>	<b>6. CUSTOMER CONSTRAINTS</b> <b>CC</b> <ul style="list-style-type: none"> <li>Availability of proper Internet connectivity.</li> <li>Power supply in case of usage of desktop system.</li> <li>Basic technological skills to maneuver through a website.</li> <li>Personal interest to check whether they have the condition.</li> </ul>	<b>5. AVAILABLE SOLUTIONS</b> <b>AS</b> <ul style="list-style-type: none"> <li>Prediction using sensors: Used because the condition is characterized by tremors as a result motion sensors used to monitor the movements and perform GAIT analysis. Is costly affair.</li> <li>Prediction using Speech test: Attributes of persons recorded speech is used to identify the condition. It is often confused with other conditions.</li> <li>Spiral and Wave test: Provides an accurate means for classification.</li> </ul>	Explore AS, Differentiate
Focus on J&P, tap into BE, understand	<b>2. JOBS-TO-BE-DONE / PROBLEMS</b> <b>J&amp;P</b> <ul style="list-style-type: none"> <li>Provide a fair, fundamental diagnosis result of the condition.</li> <li>Spread awareness about the condition.</li> <li>Eliminate Confirmation bias that leads to unnecessary panicking.</li> <li>Early diagnosis of Parkinson's disease (PD) is crucial since levodopa/carbidopa therapies work better when started when the disease is still in its early stages.</li> <li>Increased exercise is one non-pharmacologic therapy that is simpler to implement in the early stages of Parkinson's disease (PD) and may help the illness advance more slowly.</li> </ul>	<b>9. PROBLEM ROOT CAUSE</b> <b>RC</b> <ul style="list-style-type: none"> <li>Unclear decision making in getting condition.</li> <li>Lack of awareness of condition that people clearly symptoms. This could be a problem if we find out that what should their next step be etc.,</li> <li>Hesitating about the condition makes people unsure.</li> <li>Conducting firm steps that about the entire process of getting condition.</li> <li>Many symptoms can make the clouded decisions.</li> </ul>	<b>7. BEHAVIOUR</b> <b>BE</b> <ul style="list-style-type: none"> <li>Engage in research of the condition, the symptoms related to it and treatment strategies.</li> <li>The subject/customer might ask friends and relatives about any diagnosis centers or ask for general help in getting to the right hands.</li> <li>The customer might go on to several online websites and might get confirmation bias and start panicking.</li> <li>Find ways to reduce the advancement of the disease.</li> <li>Plan for a emergency phase.</li> </ul>	Focus on J&P, tap into BE, understand
Identify strong TR & EM	<b>3. TRIGGERS</b> <b>TR</b> <ul style="list-style-type: none"> <li>Social media posts that spread awareness.</li> <li>Advertisements that pinpoint the symptoms.</li> <li>The power of word.</li> <li>The cost-free, self intuitive simple nature of platform that favors interaction</li> </ul> <b>4. EMOTIONS: BEFORE / AFTER</b> <b>EM</b> <ul style="list-style-type: none"> <li>Before : Doubt, Anxious, Stressed.</li> <li>After diagnosed with the condition: Fear, Overwhelmed, vulnerable, Depressed.</li> <li>After diagnosis without the condition: Happiness, eliminated confirmation bias, Peace, Calmness.</li> </ul>	<b>10. YOUR SOLUTION</b> <b>SL</b> <p>It has been noticed that drawing speed is slower and pen pressure is lower among Parkinson's patients. Tremors and muscular stiffness are signs of Parkinson's disease, making it difficult to draw smooth spirals and waves. The usage of machine learning model that is hosted over a web framework shall allow the user to upload pictures of drawings to the said website to enable easy identification .Using Histogram of Oriented Gradients for Human Detection (HOG), a structural descriptor that measures variations in local gradient in the input image, the picture will be quantified. The resultant characteristics consist of a feature vector (list of integers) with a length of 12,996 that quantifies the wave or spiral. A Random Forest classifier will be trained using the characteristics from each image in the dataset.</p>	<b>8. CHANNELS of BEHAVIOUR</b> <b>CH</b> <p>8.1 ONLINE</p> <ul style="list-style-type: none"> <li>Visit doctor profiles and plan visits.</li> <li>Cost free, simplistic prediction can be made online.</li> <li>User Interactive website that can be accessed by anyone anytime</li> </ul> <p>8.2 OFFLINE</p> <ul style="list-style-type: none"> <li>Book an appointment and visit the doctor.</li> <li>Meet experts and ask for suggestions about treatment.</li> </ul>	Extract online & offline CH of BE