

## Project Design Phase-I

### Problem – Solution Fit Template

Date	26 October 2022
Team ID	PNT2022TMID04456
Project Name	Project - Detecting Parkinson's Disease using Machine Learning.
Maximum Marks	2 Marks

#### Problem – Solution Fit Template:

The Problem-Solution Fit simply means that you have found a problem with your customer and that the solution you have realized for it actually solves the customer's problem.

<div style="display: flex; justify-content: space-between;"> <div style="writing-mode: vertical-rl; transform: rotate(180deg); font-weight: bold;">Define CS, fit into CC</div> <div> <p><b>1. CUSTOMER SEGMENT(S)</b> <span style="float: right; background-color: #f08080; padding: 2px 5px;">CS</span></p> <p><small>Who is your customer? i.e. working parents of 0-5 y.o. kids</small></p> <div style="border: 1px solid black; padding: 10px; margin-top: 10px;"> <p>Customer who wants to detect whether they are affected by Parkinson's or not.</p> </div> </div> </div>	<div style="display: flex; justify-content: space-between;"> <div></div> <div> <p><b>6. CUSTOMER CONSTRAINTS</b> <span style="float: right; background-color: #f08080; padding: 2px 5px;">CC</span></p> <p><small>What constraints prevent your customers from taking action or limit their choices of solutions? i.e. spending power, budget, no cash, network connection, available devices.</small></p> <div style="border: 1px solid black; padding: 10px; margin-top: 10px;"> <ul style="list-style-type: none"> <li>➤ Network connection</li> <li>➤ Mobile phone or pc</li> <li>➤ Proper Power Supply</li> </ul> </div> </div> </div>	<div style="display: flex; justify-content: space-between;"> <div></div> <div> <p><b>5. AVAILABLE SOLUTIONS</b> <span style="float: right; background-color: #f08080; padding: 2px 5px;">AS</span></p> <p><small>Which solutions are available to the customers when they face the problem or need to get the job done? What have they tried in the past? What pros &amp; cons do these solutions have? i.e. pen and paper is an alternative to digital notetaking</small></p> <div style="border: 1px solid black; padding: 10px; margin-top: 10px;"> <p>*Parkinson's disease can't be cured but early detection of disease makes the people to take proper diagnosis on time to improve the quality of life.</p> <p>*Predictions can be done using sensors, but it is quite costly.</p> </div> </div> </div>
<div style="display: flex; justify-content: space-between;"> <div style="writing-mode: vertical-rl; transform: rotate(180deg); font-weight: bold;">Focus on J&amp;P, fit into BE, understand RC</div> <div> <p><b>2. JOBS-TO-BE-DONE / PROBLEMS</b> <span style="float: right; background-color: #f08080; padding: 2px 5px;">J&amp;P</span></p> <p><small>Which jobs to be done (or problems) do you address for your customers? There could be more than one; explore different sides.</small></p> <div style="border: 1px solid black; padding: 10px; margin-top: 10px;"> <p>*Eliminate confirmation bias that leads to unnecessary panicking.</p> <p>*Spread awareness about the disease.</p> <p>*Get the reviews from the customers to improve the application.</p> </div> </div> </div>	<div style="display: flex; justify-content: space-between;"> <div></div> <div> <p><b>9. PROBLEM ROOT CAUSE</b> <span style="float: right; background-color: #f08080; padding: 2px 5px;">RC</span></p> <p><small>What is the real reason that this problem exists? What is the back story behind the need to do this job? i.e. customers have to do it because of the change in regulations.</small></p> <div style="border: 1px solid black; padding: 10px; margin-top: 10px;"> <p>*Parkinson's disease is caused by a loss of nerve cells in part of the brain called the substantia nigra. This leads to a reduction in a chemical called dopamine in the brain.</p> <p>*Lack of awareness of the disease increase the risk.</p> <p>*Junk food and bad habits may also cause the disease.</p> </div> </div> </div>	<div style="display: flex; justify-content: space-between;"> <div></div> <div> <p><b>7. BEHAVIOUR</b> <span style="float: right; background-color: #f08080; padding: 2px 5px;">BE</span></p> <p><small>What does your customer do to address the problem and get the job done? i.e. directly related: find the right solar panel installer, calculate usage and benefits. Indirectly associated: customers spend free time on volunteering work (i.e. Greenpeace)</small></p> <div style="border: 1px solid black; padding: 10px; margin-top: 10px;"> <p><b>DIRECTLY ASSOCIATED:</b></p> <p>*Provide the customer spiral drawing as data.</p> <p>*Find ways to reduce advancement of disease.</p> <p><b>INDIRECTLY ASSOCIATED:</b></p> <p>*Wait for results.</p> <p>*Prepare the mind to even accept the negative result.</p> </div> </div> </div>
<div style="display: flex; justify-content: space-between;"> <div style="writing-mode: vertical-rl; transform: rotate(180deg); font-weight: bold;">Identify strong TR &amp; EM</div> <div> <p><b>3. TRIGGERS</b> <span style="float: right; background-color: #808080; padding: 2px 5px;">TR</span></p> <p><small>What triggers customers to act? i.e., seeing their neighbor installing solar panels, reading about a more efficient solution in the news.</small></p> <div style="border: 1px solid black; padding: 10px; margin-top: 10px;"> <p>*Observe the symptoms that arise in customer's health.</p> <p>*Promote the awareness.</p> </div> </div> </div>	<div style="display: flex; justify-content: space-between;"> <div></div> <div> <p><b>10. YOUR SOLUTION</b> <span style="float: right; background-color: #808080; padding: 2px 5px;">SL</span></p> <p><small>If you are working on an existing business, write down your current solution first, fill in the canvas, and check how much it fits reality. If you are working on a new business proposition, then keep it blank until you fill in the canvas and come up with a solution that fits within customer limitations, solves a problem and matches customer behavior.</small></p> <div style="border: 1px solid black; padding: 10px; margin-top: 10px;"> <p>*Due to tremor and rigidity in muscles, it is difficult to draw smooth spirals and waves.</p> <p>*So, we use spiral drawings as dataset.</p> <p>*Our goal is to quantify the images and train the machine learning model to classify then accurately.</p> <p>*We will use HOG (Histogram of Oriented Gradients) to extract features from the dataset and then passed these features to a Random Forest Classifier to train the model on classifying patterns of patients and healthy drawings.</p> </div> </div> </div>	<div style="display: flex; justify-content: space-between;"> <div></div> <div> <p><b>8. CHANNELS of BEHAVIOUR</b> <span style="float: right; background-color: #808080; padding: 2px 5px;">CH</span></p> <p><b>8.1 ONLINE</b> <small>What kind of actions do customers take online? Extract online channels from #7</small></p> <div style="border: 1px solid black; padding: 10px; margin-top: 10px;"> <p>*Online prediction is simple and free of cost.</p> <p>*User interactive website is available.</p> </div> <p><b>8.2 OFFLINE</b> <small>What kind of actions do customers take offline? Extract offline channels from #7 and use them for customer development.</small></p> <div style="border: 1px solid black; padding: 10px; margin-top: 10px;"> <p>*Consult the doctor and follow their advice.</p> <p>*Emotional support from family and friends.</p> </div> </div> </div>