Team ID: PNT2022TMID34032

Project Title: Classification of Arrhythmia by Using Deep Learning with 2-D ECG Spectral Image Representation

Project Design Phase-I - Solution Fit Template

Define CS, fit into C

1. CUSTOMER SEGMENT(S) CS

An electrocardiogram (ECG) measures the electric activity of the heart and has been widely used for detecting heart diseases due to its simplicity and non-invasive nature. By analyzing the electrical the combination of action impulse waveforms produced by different specialized cardiac tissues found in the heart, it is possible to detect some of its abnormalities. In the last decades, several works were developedd to produce automatic ECG-based heartbeat classification methods

6. CUSTOMER CONSTRAINTS C

Cardiac arrhythmia is a leading cause of cardiovascular disease, with a high fatality rate worldwide. The timely diagnosis of cardiac arrhythmias, determined by irregular and fast heart rate, may help lower the risk of strokes. Electrocardiogram signals have been widely used to identify arrhythmias due to their non-invasive approach

5. AVAILABLE SOLUTIONS AS

Treatment for heart arrhythmias may include **medications, therapies such as vagal maneuvers, cardioversion, catheter procedures or heart surgery**.

Explore AS, differe

Focus on J&P, tap into BE, understand RC

2. JOBS-TO-BE-DONE / PROBLEMS J&P

Tests to diagnose heart arrhythmias may include:

Electrocardiogram (ECG or EKG)

Holter monitor

Event recorder

Try to trigger the arrhythmia with other tests, which may include:

Stress test

Electrophysiological and mapping testing.

9. PROBLEM ROOT CAUSE RC

Age, **changes in our heart such as scarring and the effects of other chronic conditions** can raise the risk of arrhythmias

Older adults are also more likely to have health conditions, such as high blood pressure, heart failure, diabetes, and thyroid disease, that can lead to arrhythmias.

7. BEHAVIOUR BE

An arrhythmia, or irregular heartbeat, is a problem with the rate or rhythm of your heartbeat. Your heart may beat too quickly, too slowly, or with an irregular rhythm. It is normal for your heart rate to speed up during physical activity and to slow down while resting or sleeping

Focus on J&P, tap into BE, understand RC

3. TRIGGERS TR

Things that can cause an irregular heartbeat (arrhythmia) include: **Current heart attack or scarring from a previous heart attack**. Blocked arteries in the heart (coronary artery disease) Changes to the heart's structure, such as from cardiomyopathy.

10. YOUR SOLUTION SL

Treatment for heart arrhythmias may include **medications, therapies such as vagal maneuvers, cardioversion, catheter procedures or heart surgery**.

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8.1 ONLINE

Treatment theopy

8.2 OFFLINE

Meditation ,yoga, medicine

Identif

4. EMOTIONS: BEFORE / AFTER EM

BEFORE :

psychological stress increases the incidence of sudden cardiac death.

AFTER:

complications of heart arrhythmias may include **stroke, sudden death and heart failure**. Heart arrhythmias are associated with an increased risk of blood clots. If a clot breaks loose, it can travel from the heart to the brain, causing a stroke.