 Purpose / Vision : Deep learning fundus image Analysis for Early Detection of Diabetic Retinopathy

**AS**

**5. AVAILABLE SOLUTIONS**

.

**CC**

**6. CUSTOMER CONSTRAINTS**

**CS**

**1. CUSTOMER SEGMENT(S)**

**Explore AS, differentiate**

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

**Deﬁne CS, ﬁt into CC**

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

**->** Treatment might be expensive in later stages.

**->** Poor diet, lack of physical activities and poor self-monitoring of glucose levels are some of the most common obstacles faced by Diabetic patients.

**->** The manual diagnosis process of DR retina fundus images obtained by ophthalmologists is a time consuming, cumbersome, costly process and is prone to misdiagnosis unlike computer-aided diagnosis systems which are quick, cheap and simple to use.

**->** Diabetic Retinopathy patients.

**->** Diabetic Retinopathy can lead to other serious issues like blindness.

**->** Distorted vision will cause inflammation in the eye.

**BE**

**7. BEHAVIOUR**

**RC**

**9. PROBLEM ROOT CAUSE**

**J&P**

**2. JOBS-TO-BE-DONE / PROBLEMS**

**->** In all cases sugar builds up in the bloodstream, the exact cause of most types of diabetes is not unknown.

->This is because the pancreas doesn’t produce enough insulin.

**->** Both type 1 and type 2 diabetes may be caused by a combination of genetic or environmental factors.

**->** **Directly related:** Visit specialist, get treatment.

**->** **Indirectly associated**: Empowered technology, environmental threats affect their life difficulty in society.

**->** Make more discussions with a patient who has already tested and determine the severity.

**->** Accuracy and timely results are the problems.

**->** To determine if surgery or laser treatment is required.

**->** More research on specifications and reliability of the test.

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| **Identify strong TR & EM** | **3. TRIGGERS TR**  **->** Patients are anxious and in need of instant results.  **->** They often google the symptoms and treatment, and can misjudge the situation. | **10. YOUR SOLUTION SL**  **->** Multi-layer neural networks like deep NN.  **->** Due to the fact that data’s structure is Image, the best type of neural network satisfying our goal is **Convolutional Neural** **Networks.**  **->** Pre-processing data, Normalization, Creating Deep Neural Network and final model. | 1. **CHANNELS of BEHAVIOUR CH**   CH8.1 ONLINE  **->** Giving them specialized equipment to supplement educational programs would help them become more mentally and emotionally healthy.  8.2 OFFLINE  **->** Their lives are mostly impacted by entering our direct society, which includes schools, colleges and workplaces. | **Extract online & ofﬂine CH of BE** |
| **4.EMOTIONS: BEFORE/AFTER EM**  BEFORE :  Insecure, stressed, dependent.  AFTER :  Secured, Confidence, Independent. |