Project Title: AI-based localization and classification of skin disease with erythema

Project Design Phase-I - Solution Fit Template

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Define CS, fit into CC

1. CUSTOMER SEGMENT(S)

Who is your customer?
i.e. working parents of 0-5 y.o. kids

Although computer-aided diagnosis (CAD) is used to improve the quality of diagnosis in various medical felds such as mammography and colonography, it is not used in dermatology, where noninvasive screening tests are performed only with the naked eye, and avoidable inaccuracies may exist

6. CUSTOMER CONSTRAINTS

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.

Trabelsi et al. experimented with various clustering algorithms, such as fuzzy c-means, improved fuzzy c-means, and K-means, achieving approximately 83% true positive rates in segmenting a skin disease. Rajab et al.implemented.

5. AVAILABLE SOLUTIONS

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 & cons do these solutions have? i.e. pen and paper is an alternative to digital notetaking

We have shown that even without a large dataset and high-quality images, it is possible to achieve sufficient accuracy rates. In addition, we have shown that current state-of-the-art CNN models can outperform models created by previous research, through proper data preprocessing, self-supervised learning, transfer learning, and special CNN architecture techniques.

Explore AS, differentiate

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

2. JOBS-TO-BE-DONE / PROBLEMS

J&P

Which jobs-to-be-done (or problems) do you address for your customers? There could be more than one; explore different sides.

CAD has become a mainstream tool in several medical fields such as mammography and colonography.
This may result in avoidable diagnostic inaccuracies as a result of human error, as the detection of the disease can be easily overlooked.

9. PROBLEM ROOT CAUSE

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.

The reasons possible are:

- Many people have mouth sores.
- The diagnosis is by a doctor's recognition of the target lesions.

Erythema multiforme is usually caused by a reaction to an infection, usually herpes simplex virus.

7. BEHAVIOUR

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)

Erythema multiforme is usually caused by a reaction to an infection, usually herpes simplex virus. Typical symptoms include red patches with purple-gray centers (target lesions) that suddenly appear on the palms and soles, arms and legs, and face and may later spread to the body. Many people have mouth sores.

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

3. TRIGGERS

TR

What triggers customers to act? i.e. seeing their neighbour installingsolar panels, reading about a more efficient solution in the news.

Clustering algorithms generally have the advantage of being flexible, easy to implement, with the ability to generalize features that have a similar statistical variance

10. YOUR SOLUTION

SL

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 inthe canvas and come up with a solution that fits within customer limitations, solves a problem and matches customer behaviour.

We preprocessed this image by decomposing it into its

8. CHANNELS of BEHAVIOUR

CH

ONLINE

What kind of actions do customers take online? Extract online channels from #7

Type your text

OFFLINE

What kind of actions do customers take offline? Extract offline channels from #7and use them for customer development.

Identify strong TR & EM

4. EMOTIONS: BEFORE / AFTER EM

How do customers feel when they face a problem or a job and afterwards?
i.e. lost, insecure > confident, in control - use it in your communication strategy & design.

Noisy data, or the presence of outliers, can significantly degrade the performance of these algorithms. Therefore, with noisy datasets, caused by images with different types of lighting, non-clustering algorithms may be preferred; however, Keke et al. implemented an improved version of the fuzzy clustering algorithm using the RGB, HSV, and LAB color spaces to create a model that is more robust to noisy data.

hemoglobin and melanin constituents. These images were then input to the U-Net to generate the segmented output.

Online : In this work, we present a 3-layer segmentation scheme for automatic erythema detection. First, a skin region is detected with a histogram-based Bayesian classifier

Offline : Skin diseases have a serious impact on people's life and health. Current research proposes an efficient approach to identify singular type of skin diseases. It is necessary to develop automatic methods in order to increase the accuracy of diagnosis for multitype skin diseases

Identify strong TR & EM