# Project Design Phase-I
## Proposed Solution Template

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| Date | 2 November 2023 |
| Team ID | Team-592277 |
| Project Name | End-To-End Deep Learning Project For Detecting Melanoma Diseases. |
| Maximum Marks | 2 Marks |

**Proposed Solution Template:**

| S.No | Parameter | Description |
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| 1. | Problem Statement (Problem to be solved) | The objective of this end-to-end deep learning project is to develop a and accurate system for the early detection of melanoma, a deadly form of skin cancer. Melanoma is known for its rapid progression, and early diagnosis is critical for effective treatment. Current methods for detecting melanoma involve visual inspection by dermatologists, which can be time-consuming and subject to human error therefore project aims to create an automated system that can assist medical professionals in diagnosing melanoma more quickly and accurately.The proposed model simplifies the classification process by directly using raw images as input. It automatically learns important features from the images, removing the need for complicated lesion segmentation and feature extraction steps. This approach streamlines the classification process and improves efficiency |
| 2. | Idea / Solution description | We emphasizes on the use of CNNs for segmentation, classification, and detection of various diseases. The proposed method consists of two stages: First, the Mask and Region-based CNN is employed to automatically crop the region of interest from a dermatoscopic image. Next, a ResNet152 structure is utilized to classify lesions as either "benign" or "malignant." This approach aims to improve the accuracy and efficiency of medical diagnosis through advanced deep learning techniques |
| 3. | Novelty / Uniqueness | The novelty of the present methodology lies in its ability to perform skin lesion detection in a very quick time, which in turn helps technicians enhance their diagnostic skills. . The speed at which the methodology can accurately identify and classify skin lesions allows technicians to efficiently analyze a large number of images and make quicker and more accurate diagnostic decisions. |

| | | Our model also contain |
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| | | - Image scaling<br><br>- Color Tranformation:<br><br>- Contrast enhancement<br><br>- Restoration from noise<br><br>- Restoration from blur:<br><br>- Glare removal:<br><br>- Hair Removal:<br><br>- Shading removal: |
| 4. | Social Impact / Customer Satisfaction | The model's predictions can assist in early diagnosis, offering the potential for better patient outcomes and personalized care plans, ultimately improving the disease management. Cost savings in healthcare, better access to services, and hope for effective treatments contribute to overall satisfaction, making early detection a crucial element in care. By leveraging deep learning algorithms, researchers and healthcare professionals can gain deeper insights into the disease, enhance early detection, and develop more effective therapeutic interventions. |
| 5. | Business Model (Revenue Model) | Creating a business model or revenue strategy for melanoma disease detection entails providing a valuable service or product associated with the identification, diagnosis, or care of this condition. This can include diagnostic services, data analysis, software licenses, educational programs, and more, depending on the specific offerings and target market |
| 6. | Scalability of the Solution | i)Using a larger dataset:<br>Expanding the dataset size to include more diverse and representative samples of skin lesions would reduce the risk of overfitting, enhancing the model's generalization capabilities.<br>ii)Performing additional regularization and hyperparameter tuning:<br>Further refining the model through regularization techniques and fine-tuning hyperparameters can improve its performance and robustness.<br>iii)Training with Dermnet dataset:<br>Instead of using a general dataset, training the architecture with Dermnet, a specialized skin-related dataset, can potentially lead to better performance and more accurate predictions for skin lesion classification. |