A

PROJECT REPORT

ON

“Extracting Market Success or Failure Rate of a Product or Brand and Its Factors Based on Review Data Using Interpretable Machine Learning Models/Techniques”

Dissertation submitted in partial fulfillment of the requirement

For the award of degree of

MASTER OF TECHNOLOGY

IN

COMPUTER SCIENCE AND ENGINEERING

SUBMITTED BY

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1005-19-742101

Under the esteemed guidance of

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CERTIFICATE

This is to certify that the Project report entitled “Extracting Market Success or Failure Rate of a Product or Brand and Its Factors Based on Review Data Using Interpretable Machine Learning Models/Techniques”, being submitted by A. NIKHIL JOSHUA bearing Roll no 100519742101 in partial fulfilment of the requirement for the Award of the Degree of Master of Technology in Computer Science and Engineering, University college of engineering, OU.(Autonomous), Hyderabad, and will be a record of the bonafide work to be carried out by him under our guidance and supervision during the period 2020-2021.

Internal Guide Head of the Department

Mr. VENKAT DAS, B.E. Mrs.Prof.K.SHYAMALA , M.Tech, Ph.D.

Dept. of Computer Science & Engg. Dept. of Computer Science & Engg.

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DECLARATION

I, named A. NIKHIL JOSHUA bearing H.T No: 100519742101 a bonafide student of UNIVERSITY COLLEGE OF ENGINEERING OSMANIA UNIVERSITY, would like to declare that the project titled “Extracting Market Success or Failure Rate of a Product or Brand and Its Factors Based on Review Data Using Interpretable Machine Learning Models/Techniques”. A partial fulfillment of MASTER OF TECHNOLOGY Degree course of OSMANIA UNIVERSITY is my original work in the year 2021 under the guidance of Assistant Professor Mr. VENKAT DAS Garu of the Department Computer Science & Engineering.

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ACKNOWLEDGEMENT

Determination and dedication with sincerity and hard work will lead to the height of success. In spite of the obstacles faced, the valuable suggestions and their best wishes helped to complete project titled **“Extracting Market Success or Failure Rate of a Product or Brand and Its Factors Based on Review Data Using Interpretable Machine Learning Models/Techniques”** successfully.

I would like to express my gratitude to all the people behind the screen who have helped me transform an idea into a real time application.

I would like to express my heart-felt gratitude to my parents without whom i would not have been privileged to achieve and fulfil my dreams. A special thanks to our Principal, **Mr.** **Prof**. **KUMAR MOLUGARAM Garu,** who most ably run the institution and have had the major hand in enabling me to do my project.

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ABSTRACT

We are trying to predict success/failure of a product using a review dataset. Which basically contains a review title and a text body. We will be using Sentiment Analysis and Count Vectorization for factor extraction. And then perform ML operations to identify which feature would be the best to work upon to improve product's sales. We'll also try to integrate LIME to interpret the results.

CHAPTER 2

## REQUIREMENT SPECIFICATION AND ANALYSIS

### 2.1 FUNCTIONAL REQUIREMENTS

#### 2.1.1 Functional Requirements of Face Mask Dataset

1. The system must have an unbiased ‘with\_mask’ dataset.
2. The dataset must have over 1500+ images in both ‘with\_mask’ and ‘without\_mask’ classes.
3. The dataset must not re-use the same images in training and testing phases.

2.1.2 Functional Requirements of Face Mask Detector

1. The system must be correctly able to load the face mask classifier model.
2. The system must be able to detect faces in images or video stream.
3. The system must be able to extract each face’s Region of Interest (ROI).
4. There must not be any object between the system and the face of the user for successful face detection and hence the face mask detection.
5. The end position of the face must be fit inside the webcam frame and must be closer to the camera.
6. Correctly able to detect masks in ‘*png*’, ‘*jpg*’, ‘*jpeg*’, and ‘*gif*’ format images.
7. The system must be able to detect face masks on human faces on every frame in a live video.
8. The results must be viewed by showing the probability along with the output of ‘Mask’ or ‘No\_Mask’.

## 2.2 NON-FUNCTIONAL REQUIREMENTS

### 2.2.1 Product Operation

The face should be localized by detecting