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In Collaboration with

UNIVERSITY OF WESTMINSTER

**A Machine Learning Approach to Assist the Company  
Productivity Loss due to Depressed Employees**

A Dissertation by

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Submitted in partial fulfillment of the requirements for the BEng/BSc in Software Engineering degree at the University of Westminster.

**07/2022**

## **Abstract**

Depression is a mental condition in which the majority of mankind is affected simply due to sudden altering of mood of humans. Most dangerous effects of depression is Suicide, while Covid-19 had taken part as the most common reason for arising of depression for people who work from home. However due to depression, the companies often suffer loss in productivity. In addition, loss of productivity can lead to impairment of maintaining the company's reputation. The main reason for companies suffering huge losses is due to the failure in acknowledging the state of depressed employees. Furthermore, certain research had depicted about depression through the emotions of employees and their risk of productivity loss towards the company by using a new scale. In this new scale taking the emotions about sleep routine, low mood, lack of energy, hopelessness, and lack of pleasure.

Company employees can login to web application called Pro {Test} and give answers as text base inputs for the relevant questions according to the new scale and easily can find depressed level percentage. After that can calculate productivity loss to the company by the depression level of that employee by giving company per hour productivity and lost working hours of the employee. Then, the result displays the company productivity loss how many percentage forced the depression. The development of this present web application aided via Supervised machine learning. The machine learning model of the web application gives prediction accuracy as 85 % for the Support Vector Machine algorithm.

The testing of the application done under two categories as Non-Functional testing and Functional testing. In functional testing, it conducted through the functional requirements of the research. In non-functional testing has done through the several areas. The implemented machine learning model accuracy tested under accuracy testing, and it contributed to check the model prediction output is similar to the expected output. The performance testing and security testing helped to understand the system performance and security of the system. Therefore, the system accurate the best performance and accuracy.