BUSITEMA UNIVERSITY
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FACULTY OF ENGINEERING

DEPARTMENT OF COMPUTER ENGINEERING

PROJECT REPORT

TITLE:

WEB-BASED DRIVER UNDER INFLUENCE OF ALCOHOL MONITORING AND SAFETY SYSTEM

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Submitted in partial fulfillment of the requirements for the award of a Bachelors Degree of Computer Engineering from Busitema University

JANUARY, 2021

DECLARATION

I ONEN FELIX hereby declare this project report is my original work with exceptions of where citations have been made and this paper has not been presented to any institution of higher learning for the award of academic paper.

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APPROVAL

This is to certify that the project report entitled "WEB BASED DRVIER UNDER INFLUENCE OF ALCOHOL MONITORING AND SAFETY SYSTEM" has been under my supervision and has been submitted to the board of examiners with my approval

Dr. GILBERT.G. OCEN

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DEDICATION

I dedicate this report to my parents, especially Mr. Ojok Francis and Ms. Abalo Naume, my uncle Mr. Wokorach Denish and siblings and to all my friends for always being there for me especially in this journey of academics.

AKNOWLEDGEMENT

I have taken efforts in this project. However, I greatly thank the almighty God because it would not have been possible without him.

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ABSTRACT

The Web Based Driver Under Influence of Alcohol Monitoring and Safety system is designed specially to provide the police forces with Real time information regarding any violation of the alcohol laws while driving. In Uganda, driving under influence of alcohol and over speeding have been the leading factor in causing accidents within the country. The police force plays an important role in ensuring laws in relation to alcohol are maintained. In fact, they ensure safety for road users, minimize losses to citizens through property destruction and ensure the available transportation infrastructures are maintained. This greatly helps the country to develop economically and socially. However, the current methods being employed by the police force in limiting driving under influence, more especially in Uganda the breathalyzer-based system is tedious, time consuming, discomforting to drivers, inefficient, can be corrupted easily and requires more man power. There is need for a monitoring system that can scale with the population size and requires little effort to be efficiently used by the limited man power in the country. This study used alcohol sensing and the power of web based systems to properly monitor alcohol violation while driving in all roads of the country remotely over the internet. To solve the challenges, the study developed a Web based Driver Under Influence of alcohol monitoring and safety system with an aim to monitor and provide information regarding the identity and location of drivers in violation. The developed system provides three major functionalities. One, the system captures details of the trucks including the driver. Two, the system checks whether the concentration of alcohol in a driver's breath is beyond the legally prescribed limit and the records the location data and provides a warning to the driver before stopping the vehicle, the system then sends the information to a web application that relays the information to the officers monitoring. Results of the testing and validation show that the system performs the above mention functionalities. Therefore, it is anticipated that the system will reduce cases driving under the influence of alcohol.

LIST OF ACRONYMNS

API: Application Programming Interface 12

BAC: Blood Alcohol Concentration 16

DC: Direct Current 20

DDDAS:Drunk Driver Detection and Alert System 11

DUI: Driver Under Influence 11

GPS: Global Positioning System 12

USB: Universal Serial Bus 19

WHO: World Health Organisation 8

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CHAPTER ONE

1.1 BACKGROUND

Ethyl alcohol or ethanol, more commonly referred to as alcohol, belongs to a family of organic compounds called alcohols. Alcohol is highly soluble in the body's water, which makes up 50-60 percent of body weight. Even though alcohol is a central nervous system depressant, people take it as a stimulant and in the early stages it can produce feelings of euphoria. When consumed at larger amount, performance and behaviour can be impaired resulting in reduced coordination, loss of motor control, lack of good judgment, and at very high concentrations (greater than 0.4 g/dL) loss of consciousness and death[1].

Globally according to World Health Organization (WHO), alcohol causes 3.2% of all deaths or 1.8 million deaths annually and accounts for 4.0% of disease burden. about half of the deaths attributable to alcohol are from injuries. The acute consumption of alcohol has been shown to affect a number of cognitive functions, including planning, verbal fluency, memory and complex motor control, and deficits in cognitive functions may increase the risk of injury[2].

In Uganda, The Uganda Police Force recorded a total of about 9,000 deaths in road traffic accidents in 2019. The latest statistics by police indicate that at least 3,500 people have been dying in traffic road accidents annually in the past three years[3]. According to Dr Olive Kobusingye the research principle investigator, Speeding and use of alcohol based on where the accidents happen were the major driving factors for the accidents[3]. According to Section 112 of Uganda's Traffic Control and Road Safety Act 1998, The legally prescribed limit is 80 milligrams of alcohol in 100 milliliters of blood, (expressed as 0.08 per cent of blood alcohol content) which is equivalent to 35 milligrams of alcohol in 100 milligrams of breath[4].

Different efforts have been put to combat road accidents due to driving under influence of alcohol, some of the systems are; Breathalyzers which is used by traffic policemen to measure alcohol concentration in the breath of a suspected drunk driving individual. Breathalyzers provide a solution though it requires more man power and it is also time demanding. There is also the Ignition interlock device which is used to detect alcohol concentration of driver before starting the vehicle[5][6], this is not so effective since it can easily be compromised and no action is taken in cases of drinking while driving, Behavioural Systems are also implemented which use computer vision and machine learning techniques to detect drivers facial land marks to determine drowsiness, this works for sleepiness but not so effective for alcohol detection[7]

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