ONLINE SYSTEM DEVELOPMENT FOR CRITICAL PARAMETER OBSERVATION IN ELECTRONIC FABRICATION LABORATORY

MUHAMMAD HAFIZUDIN BIN SHAMSUDDIN

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

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ONLINE SYSTEM DEVELOPMENT FOR CRITICAL PARAMETER OBSERVATION IN ELECTRONIC FABRICATION LABORATORY

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This report is submitted in partial fulfilment of the requirements for the degree of Bachelor of Electronic Engineering with Honours

Faculty of Electronic and Computer Engineering
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APPROVAL

I hereby declare that I have read this thesis and in my opinion this thesis is sufficient in terms of scope and quality for the award of Bachelor of Electronic Engineering with Honours.

Signature	:	……
Supervisor Name	:	Dr. Imran bin Mohd Ibrahim
Date	:	……

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DEDICATION

I dedicate this thesis to,

My beloved parents,

My family,

My Supervisor,

All of FKEKK Lecturers,

And to all of my supportive friends

For their morale boost and keep on helping others.

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ABSTRACT

In this era, technologies are growing fast and making thing that seem impossible in the past to be possible. Technologies were developed to increase production efficiency and safety. This could improve every industry safety in the production line where response time due to any event can be reduce. Every place has their own limit and possible hazard that could lead to injury or death. To reduce the amount of victim due to the accident, online monitoring system have been introduced where various sensors measure the hazard level and sends the data to a microcontroller to be transmitted to a cloud storage such as Firebase or Thingspeak and the saved data will be downloaded by a mobile application to be displayed. The speed of data transmitted must be stable and fast enough for a fast response due to accident. At the same time, the device should be installed with alert system as a precaution to nearby people. Finally, this study is important to improve online monitoring system efficiency and speed.

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ABSTRAK

Dalam era ini, teknologi sedang berkembang dengan pesat sehingga menjadikan perkara yang hampir mustahil untuk dilaksanakan di masa lampau dapat dilaksanakan pada masa kini. Teknologi ditambah baik dari masa ke semasa adalah untuk meningkatkan kecekapan pengeluaran dan keselamatan orang lain. Ini dapat menaik taraf tahap keselamatan kawasan pengeluaran dalam sesuatu industri secara amnya dengan mengurangkan tempoh bertindak terhadap sesuatu kemalangan. Untuk mengurangkan jumlah mangsa dalam sesuatu kemalangan, sistem pemantauan dalam talian kini diperkenalkan dimana pelbagai jenis sensor digunakan untuk mengukur sesuatu perkara yang boleh menjadi penyebab kemalangan. Sensor tersebut akan hantar maklumat ke pengawal mikro untuk dihantar ke storan penyimpan awan seperti Firebase atau Thingspeak. Kemudian, maklumat yang disimpan akan dimuat turun oleh satu aplikasi telefon pintar untuk dipaparkan. Kepantasan penghantaran maklumat hendaklah stabil dan pantas untuk diambil tindakan segera terhadap sesuatu kemalangan. Akhir sekali, kajian ini adalah penting dan bertujuan untuk mengasilkan sistem pemantauan atas talian yang cekap dan pantas.

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Secondly, I would also like to express my gratitude to both of my parents for supporting and taking care of me and my education to this level by giving constant advising, encouragement and guiding my life until now. I also want to express my appreciation to my supervisor, Dr. Imran bin Mohd Ibrahim, for his advice and guidance in completing this project. His patience, support and willingness to give his time has been highly appreciated.

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LIST OF SYMBOLS AND ABBREVIATIONS

IoT	:	Internet of Things
BDP	:	Bachelor Degree Project
SMS	:	Short Message Service
PWM	:	Pulse Width Modulator
GPIO	:	General-Purpose Input Output
RAM	:	Random Access Memory
ROM	:	Read-Only Memory
CPU	:	Central Processing Unit
UART	:	Universal Asynchronous Receiver/Transmitter
I2C	:	Inter-integrated Circuit
SPI	:	Serial Peripheral Interface
IEEE	:	Institute of Electrical and Electronics Engineer
ADC	:	Analog to Digital Converter
EEPROM	:	Electrically Erasable Programmable Read-Only Memory
SnO_2	:	Tin (IV) Oxide
LPG	:	Liquefied Petroleum Gas
ppm	:	Parts per million
LED	:	Light-Emitting Diode

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LDR	:	Light-Dependent Resistor
SOC	:	System on Chip
TCP/IP	:	Transmission Control Protocol and the Internet Protocol
AT	:	Attention
RH	:	Relative Humidity
NTC	:	Negative Temperature Coefficient
MOS	:	Metal-Oxide Semiconductor
GHz	:	Gigahertz
KHz	:	Kilohertz

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CHAPTER 1

INTRODUCTION

1.1 Introduction

This chapter will be discussing about the general overview and explain briefly about this project, list of objectives that need to be achieve, problem statement, scope of project and organization of the thesis.

1.2 Project Background

In this Bachelor Degree Project (BDP), the title given to me by my supervisor, Dr. Imran bin Mohd. Ibrahim, which is “Online System Development for Critical Parameter Observation in Electronic Fabrication Laboratory”. In this era of advance technology, safety and precaution can be improve drastically even with small change of current technology.

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Safety of other people have been a main factor for an engineer nowadays. Even a small accident that can small injury to workers would lead to big problem to engineer because they are responsible for everything they design. Furthermore, accident and hazard can be happening anywhere, anytime, at any condition, and they can cause injury or death.

So, highest level of precaution is needed to avoid as much victim as possible if certain problem happens unexpectedly. There are a lot of possible ways to solve this problem which leads to Online Monitoring System Development, where at any hazardous place can be monitor its condition at a far distance. This system has been built years before by engineers and it is working just fine. Amount of accident happen in industry are reducing gradually these years because they could prevent it from going to bigger disaster that could cause tons of lives.

In 1984, the world's worst industrial disaster happens Bhopal, India. This deadly accident had occurred at Union Carbide pesticide plant, where they accidently made a small mistake and released 30 tons of highly toxic gas called methyl isocyanate and other few poisonous gases. These gases spread out to the nearby village in Bhopal, involving 600,000 people being exposed to this deadly gas and effecting their health.

Most of the victims died from the accident as the effect of gas poisoning. This is the example of accident that can happen in industry and the number of victim that it could cost. At that age, online system is not well developed as what we have now. So, having this technology in industry could prevent such accident to happen and at the same time reduce the risk of the worker from becoming the victim of the accident.

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