Universiti Teknologi MARA

Iot- Based Recreational Area Smart Street Lighting System

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ABSTRACT

Currently, in the whole world, enormous electric energy is consumed by the streetlights. This study explored the feature of Internet of Things (IoT) in addressing the problem of the energy waste in terms of lighting street. Smart street lighting system is a project on intelligent illumination control of streetlights to optimize the problem of power consumption and illumination of the streets. Streetlights today are being replaced by LED street lighting system, which reduces the power consumption. This smart street lighting system consists of LED lights, light sensors, motion sensors and short-distance communication networks. The objective of this thesis is to develop a street lighting system that the intensity of light depends on the location of a person. Furthermore, the purpose is also to design and develop prototype of a smart street lighting system at a recreational area.

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Chapter 1: Introduction

1.1 Background Study

Internet of Things (IoT) is a proposed development of the internet in which it connects everyday objects to certain network connectivity and so, it allows the object to send and receive data form the network connectivity itself. With this new development, these devices are intelligently interconnected and there by creates a new form of communication between objects and people, and among the devices itself. Thus, this interconnection between devices or object helps us humans (people) to save electricity, have more security and also enhances safety of our house or property. This type of communication is the basic that drives the growth of automation technology in home and technology industries.
According to the advances in LED lighting, it has brought very favourable opportunities for application in street lighting. PV powered street light utilising LED has become a norm in many places, combining with high illumination characteristics with current photovoltaic (PV) technology and LED's low power consumption.

In Kota Kinabalu, Sabah, a company that is specializes in installation, designing, and maintenance of solar powered system has successfully installed 30 standalone street lighting utilising LED and PV for their Dewan Bandaraya Kota Kinabalu as part of a project to implement green initiative in its area of governance. These street lights are located at the outskirts of the city for the society such as balai rayas, mosques and churches. These street lights are designed to operate in such away it will work on a timer basis from 6pm – 6am (12 hours) daily.

To further reducing size and cost of the energy load, there are lot of other ways to make the system to be more efficient, although utilising LED in street lights have actually contributed in minimizing the size of PV and batteries. In this study, a motion sensor is added to sense the movement in the vicinity of the recreational area. The LED's light intensity is varied based on the movements detected by the motion sensor. When there is