



**UNIVERSITI TEKNIKAL MALAYSIA MELAKA**

**SMART MIRROR**

This report is submitted in accordance with the requirement of the Universiti Teknikal Malaysia Melaka (UTeM) for the of Bachelor of Electronics Engineering Technology (Telecommunications) with Honours.

by

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**BORANG PENGESAHAN STATUS LAPORAN PROJEK SARJANA MUDA**

Tajuk: SMART MIRROR

Sesi Pengajian: 2019

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## **APPROVAL**

This report is submitted to Faculty of Electrical and Electronic Engineering Technology (FTKKE) of Universiti Teknikal Malaysia Melaka (UTeM) as a partial fulfilment of the requirements for the degree of Bachelor of Electronics Engineering Technology (Telecommunications) with Honours. The member of the supervisory is as follow:

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## ABSTRAK

Internet menghubungkan manusia kepada maklumat di alam maya dengan lebih mudah. Telefon bimbit juga kemudiannya menjadi lebih pintar dan sejak itu konsep ini telah meletus dan berubah menjadi *Internet of Things*, lantas menghubungkan manusia dan teknologi dengan objek seharian. Tidak ada objek yang tidak boleh diinovasi, tetapi hendaklah dilakukan mengikut kesesuaian. Cermin sebagai contoh, mempunyai permukaan yang besar untuk memaparkan maklumat dan sangat sesuai untuk berinteraksi. Kebanyakan orang mempunyai cermin di rumah, jadi inovasi cermin pintar ini dihasilkan untuk menjadikan interaksi antara manusia dan cermin lebih menarik. Ciptaan ini mempunyai fungsi lebih dari cermin biasa. Peranti ini kelihatan seperti cermin biasa tetapi akan mempunyai skrin di dalam dan pengguna akan dapat berinteraksi dengannya. Reka bentuk cermin pintar menggunakan Raspberry Pi. Ini mungkin kelihatan seperti cermin biasa, tetapi perbezaannya ialah ia dapat memaparkan cuaca, suhu, masa, dan berita. Smart Mirror dilaksanakan dengan menggunakan komponen seperti Raspberry Pi, monitor LCD ditutup dengan akrilik dua hala. Raspberry Pi yang berfungsi sebagai Mikrokontroler boleh disambungkan ke data Internet dan akan memaparkan maklumat seperti laporan cuaca lokasi. Ini menerangkan bagaimana cermin pintar dibina menggunakan pi raspberry sebagai perkakasan.

## ABSTRACT

The Internet transformed our lives by connecting us more easily to information and other people in the virtual world. Mobile phones then became smart-phones and since then this concept has erupted and morphed into the Internet of Things, things which connect us to everyday objects. There is no end of objects that could be made “smarter”, some being more suited to this than others. Mirrors, for example, provide a large surface ideal for displaying information and interacting with. Most people have mirrors at home so the concept of a smart mirror that we can interact with is attractive. The device was to go beyond an ordinary mirror. The device was to look like a regular mirror but would have a screen inside and you would be able to interact with it. The design of smart mirror using Raspberry Pi. This may look like the regular mirror, but the difference is it displays weather, temperature, time, and newsfeed. The Smart Mirror is implemented using peripherals like Raspberry pi, LCD monitor covered with a two-way acrylic sheet. The microcontroller can connect to the Internet and can retrieve data from the internet which displays weather report of the location.

## **DEDICATION**

This thesis is dedicated to:

My beloved parents,

My supervisors,

My lecturers

My family,

And all my friends,

Thank you for the guidance, encouragements and support.



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# **LIST OF ABBREVIATIONS, SYMBOLS AND NOMENCLATURE**

DC	- Direct current
LCD	- Liquid-crystal display
IoT	- Internet of Things
USB	- Universal Serial Bus
PWM	- Pulse Width Modulation
LED	- Light emitting diode
MCU	- Micro Controller Unit
PCB	- Printed Circuit Board
GND	- Ground
VCC	- Power Supply
RX	- Receive Data
TX	- Transmit Data
LoRa	- Long Range
COM	- COMMON
DC	- Direct Current
IDE	- Integrated Development Environment
GSM	- Global System for Mobile
ADC	- Analog-To-Digital Converter
LDR	- Light Dependent Resistor
PIC	- Programmable Interface Controller

# CHAPTER 1

## INTRODUCTION

### 1.1 Introduction

Efficiency and productivity are two characteristics that progressively establish their supremacy as keyword businesses use their goods to market. It has become a true selling point that their item can multi-task or boost efficiency better than the other competitor. This is due to the reality that an important element in growing daily life manufacturing is efficient time management. Being willing to discover time where there was no moment before is the finest time leadership techniques. Integrating innovation into the regular life of people has rendered it possible to manage time. Using goods like tablets, PCs, and smartphones gave individuals access to the instruments they required to be efficient.

We all know what a mirror is. It's an object found in the homes of most people. We see our reflections in mirrors. But what if you combine a mirror idea with technology? What are the possibilities and how clever a mirror could be? These are some of the issues that inspired my final-year project selection, a project aimed at developing an intelligent mirror powering by small power source to operate system. The gadget was to go past a conventional mirror, to have a screen inside that you would probably cooperate with by utilizing voice directions, hand motions and cell phones or other gadgets. Electronic Engineering is a very wide area and it has been difficult to choose a specific area according to every feature of it and due to a lot of ideas to choose for. Smart Mirror, however, was finally chosen because it contains extraordinary

combination of numerous of the things such as web technologies, electronics, UI design, etc.

However, although it has used good technological goods to boost efficiency, it has also achieved its reasonable share to suppress it. Using technology has become another job on the routine to - do list for everyone. Technological progress should shape, not the other way around, to our timeline. This is where the concept of the intelligent mirror came from. The Smart Mirror concept was directed at seamlessly integrating technology into the lives of individuals by attaching it where the routine of all undoubtedly interferes, the bathroom. The Smart Mirror's objective is to boost the efficiency of a user by sparing them time. The Smart Mirror offers an almost effortless experience that enables the user to simply move up and receive data for which they would typically need a different device. Despite the reality that this data can be discovered on the other appliances of the user, during the typical grooming activities it is the time-saving comfort to have this data accessible.

The Smart Mirror generally consist of a one-way mirror with a screen monitor connected to it showing a static web page. One of the goals is to combine IOT with something that is close to human daily routine and can be interact to.

## **1.2 Problem Statement**

Excellent time management is among the most factors to be consider in the everyday life of a person for success and productivity. With the increasing modernization of technology into our life, maintaining an effective routine has become easier. Staying current-to-date with meetings, news, social media and other stuff is easier by innovation such as tablets PCs and smartphones, as well as distractions that can disrupt the routine of anyone. Technology is now just another process in the day

for which time must be allocated. Technology needs to be redesigned in the specific amount of time of the day to work within our schedule and not being an additional piece to it.

Multitasking is the key to efficient timing leadership combining with the technology. Everyone in the industrial or academic world will agree that every second in daily routine is precious. This project was developed through inspiration from films such as Iron Man and tech demos, such as Samsung's transparent LCD Smart Window that been introduced to the worldwide in 2012. This also contributes to the ongoing trend of utilization of touch screens and internet connectivity in regular daily appliances such as ovens and refrigerators

### **1.3 Objectives and Goals of Project**

- a) Combining human daily routine with IOT in line with future technology.
- b) Simple sleek technology and user-friendly devices that close related to human.
- c) Proposes to decrease and potentially eliminate the user's need to spare time to inspect their PC, iPad or smartphone for the data they need in their regular daily routine

The Smart Mirror must give advantages of using contemporary technology while seamlessly incorporating into most people's normal grooming habits. The Smart Mirror must be as easy as possible and as user friendly. Using the Smart Mirror would combine technology and the need for data into the daily timetable of anyone. With the mirror in place, the user could interact during their normal morning and night routines and obtain the information they want.

This Smart Mirror proposes to decrease and potentially eliminate the user's need to spare time to inspect their PC, iPad or smartphone for the data they need in their regular daily routine. With little or no attempt from the user, the monitor will provide the data with the objective of not being a burden that he or she must conserve. The mirror will not be another practice, but an improvement of the most contemporary places that is popular to get use of mirrors.

The mirror will be brain remainder for the user. First it provides the calendar plan, to-do lists, social media, news, and climate will be updated with the user. The data would not be tossed into the hands of the user but presented tidily on the corners of the mirror to enable the real mirror to still be used. Using touchless gestures will make stuff easy and straightforward to use. No keyboards trying to maintain smooth and clean. The movements will also enable the customer to use the mirror despite being moist or unclean on their palms. Most individuals visit their smartphones or tablets for popular data, such as weather, news, social media, and plans, through the mirror. This enables users to read, believe and schedule their day in the daily life while getting prepared. The mirror must also be enjoyable. It will provide music livestream that can be regulated by your speech, so a mouse or keyboard is not needed.

#### **1.4 Scope of Work**

Based on goals and objectives of this project, this project aiming to provide a single, convenient-to-reach spot for an individual to obtain all the data that might influence how they are preparing for the day. With LCD screens and a mirror, weather, time, date and news are accessible at a quick look. Furthermore, a user-friendly interface, available from any Wi-Fi-enabled device enables the user to readily set up the link to their home Wi-Fi, modify the place from which they obtain the weather and pick a

source from which to obtain news for the day. By constructing these characteristics into a mirror that most individuals will already use in their regular routine, this data can be presented in such a fashion that it blends elegantly with the morning grooming activity. The operating system would support running and the primary characteristics would be to display fundamental weather and time data, to be prepared to insert alarms alerts or notes in the same manner that we put post-it cards on a fridge

### 1.5 Expected Results

<b>Description:</b>	Smart Mirror should be capable of projecting widgets.	
<b>Test Number</b>	<b>Action</b>	<b>Expected Outcome</b>
<b>1</b>	Ensure that a greeting is present in the bottom part of the mirror.	Greeting is shown in the mirror bottom part. Message depends on assign time.
<b>2</b>	Make sure the current date and time appears on the mirror's top right side.	The present date and time are correctly reflected on the mirror's top right side.
<b>3</b>	Make sure the calendar appears on the mirror's top left side.	The calendar is correctly reflected on the mirror's top left side.

**Table 1.5 Expected Results**

### 1.6 Thesis Organization

This study consists of five sections of the chapter. This whole section will discuss the implementation of this Intelligent Mirror project

I. Chapter 1 describes the outline of the project, including introduction statement of problems, goals, scope of job, appropriate studies expected outcomes, organisation