POLITEKNIK SULTAN SALAHUDDIN ABDUL AZIZ SHAH

SMART AUTOMATIC HANDWASH

NAME :
PUTERI KHAIRUL BARIYAH
BINTI MOHD SULAIMAN

REGISTRATION NO :
08DEU20F2015

JABATAN KEJURUTERAAN ELEKTRIK

SESI 2 2022/2023

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This report submitted to the Electrical Engineering Department in fulfillment of the requirement for a Diploma in Electrical Engineering

JABATAN KEJURUTERAAN ELEKTRIK

SESI 2 2022/2023

CONFIRMATION OF THE PROJECT

The project report titled "SMART AUTOMATIC HANDWASH" has been submitted, reviewed and verified as a fulfills the conditions and requirements of the Project Writing as stipulated

Checked by:

Supervisor's name : **NORHAYATI BINTI CHE HUSIN**

Supervisor's signature:

Date :

Verified by:

Project Coordinator name :

Signature of Coordinator :

Date :

"I acknowledge this work is my own work except the excerpts I have already explained to our source"

1. Signature :

Name : **PUTERI KHAIRUL BARIYAH BINTI MOHD SULAIMAN**

Registration Number : **08DEU20F2015**

Date :

DECLARATION OF ORIGINALITY AND OWNERSHIP

TITLE : SMART AUTOMATIC HANDWASH

SESSION: SESI 2 2022/2023

1. I, **1. PUTERI KHAIRUL BARIYAH BINTI MOHD SULAIMAN**

   08DEU20F2015

   is a final year student of **Diploma in Electronic(Medical) Engineering, Department of Electrical, Politeknik Sultan Salahuddin Abdul Aziz Shah**, which is located at **Persiaran Usahawan,40140 Shah Alam Selangor Darul Ehsan**. (Hereinafter referred to as 'the Polytechnic').

2. I acknowledge that 'The Project above' and the intellectual property therein is the result of our original creation /creations without taking or impersonating any intellectual property from the other parties.

3. I agree to release the 'Project' intellectual property to 'The Polytechnics' to meet the requirements for awarding the **Diploma in Electrical Engineering** to me.

Made and in truth that is recognized by;

a) **PUTERI KHAIRUL BARIYAH BINTI MOHD SULAIMAN**) .....

(Identification card No: - 020109101648)) **PUTERI KHAIRUL BARIYAH BINTI MOHD SULAIMAN**

In front of me, **NORHAYATI BINTI CHE HUSIN** (740807-03-6084)) .....

As a project supervisor, on the date:) **NORHAYATI BINTI CHE HUSIN**

ACKNOWLEDGEMENTS

I have taken efforts in this Project. However, it would not have been possible without the kind support and help of many individuals and organizations. I would like to extend my sincere thanks to all of them. I am highly indebted to (PUAN NORHAYATI CHE HUSIN) for their guidance and constant supervision as well as for providing necessary information regarding the Project & also for their support in completing the Project.

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ABSTRACT

Nowadays, there are almost of the entire place for example at hospital, restaurants, public area, houses, offices/industry, school, colleges and universities have the hand washing tool. The functions of this tool are to wash and dry the hands. But normally these tools operate by semi automatic or manual. To give this tool can be more systematic and particular "automatic hand wash" for automatically washing and drying the hands is proposed. This project will design to combine four functions in one device which is the soap, water, dryer and sanitizer. The project consists of the microcontroller chip, an infra-red (ir) sensor and any other device. The main component that must be used to make sure an automatic hand washing and drying machine operating for automatically is a microcontroller chip, Arduino program.this microcontroller used to control the whole machine which is water, soap, dryer and hand sanitizer. The ir sensor consists of an ir transmitter sensor and an ir detector sensor. The ir transmitter sensor will continuously emit an ir wave, forming a straight light from the ir transmitter to the ir detector. When the ir wave between ir transmitter sensor and ir detector sensor is interrupted by user hands, a signal will be sent to the microcontroller. Then the microcontroller will analyze the signal and the Machine will operate whether it produces water, soap and continue the drying process will happen. Smart automatic hand wash is specially designed to make it easy for someone to wash hands and maintaining cleanliness within a period of time with the combination of several products that are integrated. It uses soap, then rinses with water again automatically, followed by hand drying using tissues and hand drying machine and end the program with sanitizer rinse to remain hygiene. Use of hand sanitizer is placed after washing and drying hands. Sequence of all automatically intermittently performed in the sequence that will be produced through a program special. In addition, there is a flow place to re-add the soap and sanitizer liquid without opening an important part of the product. It is placed on the right side of the product with a suitable door to place the funnel for filling the such liquid. The quantity of liquid addition is determined to ensure that the soap and sanitizer container is full and does not exceed the required quantity. To find out the quantity of liquid consumed, the program can be executed without any liquid issuing at the such time interval, as an example when the period of soap is out only the lcd displays the interval of the thing without issuing the soap liquid. When the liquid is determined to be running out, so the user can refill the liquid with the specific quantity set for the user to use the product completely again.

Key word: *Microcontroller chip ,Arduino, Ir sensor, refill*

ABSTRAK

Pada masa kini, terdapat hampir keseluruhan tempat contohnya di hospital, restoran, kawasan awam, rumah, pejabat/industri, sekolah, kolej dan universiti mempunyai alatan mencuci tangan. Fungsi alat ini adalah untuk mencuci dan mengeringkan tangan. Tetapi biasanya alat ini beroperasi secara separa automatik atau manual. Untuk memberikan alat ini boleh menjadi lebih sistematik dan khusus "cuci tangan automatik" untuk mencuci dan mengeringkan tangan secara automatik adalah dicadangkan. Projek ini akan mereka bentuk untuk menggabungkan empat fungsi dalam satu peranti iaitu sabun, air, pengering dan sanitizer. Projek ini terdiri daripada cip mikropengawal, sensor infra-merah (ir) dan sebarang peranti lain. Komponen utama yang mesti digunakan untuk memastikan mesin basuh dan pengeringan tangan automatik beroperasi secara automatik ialah cip mikropengawal, program Arduino. Mikropengawal ini digunakan untuk mengawal keseluruhan mesin iaitu air, sabun, pengering dan pembersih tangan. Sensor ir terdiri daripada sensor pemancar ir dan sensor pengesan ir. Sensor pemancar ir akan memancarkan gelombang ir secara berterusan, membentuk cahaya lurus dari pemancar ir ke pengesan ir. Apabila gelombang ir antara sensor pemancar ir dan sensor pengesan ir terganggu oleh tangan pengguna, isyarat akan dihantar ke mikropengawal. Kemudian mikropengawal akan menganalisis isyarat dan Mesin akan beroperasi sama ada menghasilkan air, sabun dan meneruskan proses pengeringan akan berlaku. Cuci tangan automatik pintar direka khas untuk memudahkan seseorang mencuci tangan dan menjaga kebersihan dalam tempoh masa dengan gabungan beberapa produk yang disepadukan. Ia menggunakan sabun, kemudian bilas dengan air sekali lagi secara automatik, diikuti dengan pengeringan tangan menggunakan tisu dan mesin pengering tangan dan tamatkan program dengan bilas sanitizer untuk mengekalkan kebersihan. Penggunaan hand sanitizer diletakkan selepas mencuci dan mengeringkan tangan. Urutan semua secara automatik terputus-putus dilakukan dalam urutan yang akan dihasilkan melalui program khas.Di samping itu, terdapat tempat aliran untuk menambah semula sabun dan cecair sanitizer tanpa membuka bahagian penting produk. Ia diletakkan di sebelah kanan produk dengan pintu yang sesuai untuk meletakkan corong untuk mengisi cecair tersebut. Kuantiti penambahan cecair ditentukan bagi memastikan bekas sabun dan sanitizer penuh dan tidak melebihi kuantiti yang diperlukan. Untuk mengetahui kuantiti cecair yang digunakan, program boleh dilaksanakan tanpa mengeluarkan sebarang cecair pada selang masa tersebut, sebagai contoh apabila tempoh sabun keluar hanya lcd memaparkan selang benda itu tanpa mengeluarkan cecair sabun. Apabila cecair ditentukan untuk kehabisan, jadi pengguna boleh mengisi semula cecair dengan kuantiti tertentu yang ditetapkan untuk pengguna menggunakan produk sepenuhnya semula.

Kata kunci: Cip mikropengawal, Arduino, sensor Ir, isi semula

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CHAPTER 1

INTRODUCTION

1.1 Introduction

Since the covid-19 pandemic hit Malaysia and the world, everyone follows the preventive measures recommended by the Ministry of Health, including frequent hand washing, but today in everyday life, everyone does not care about their health to keep their hands clean properly. Hand washing for hand hygiene is the act of cleaning hands with or without using water or other liquids, or using soap, for the purpose of removing dirt that can be seen with the naked eye such as soil, oil sand, and other very dangerous dirt such as bacteria,germs or microorganisms. Medical hand hygiene is related to hygiene practices related to the administration of drugs and medical care that prevent or minimize disease and the spread of disease. The main medical purpose of hand washing is to clean the hands of pathogens (including bacteria or viruses) and chemicals that can cause harm or illness. This is especially important for those who handle food or work in the medical field, but it is also an important practice for the general public. People can catch respiratory diseases such as colds or flu, for example, if they don't wash their hands before touching their eyes, nose or mouth. In fact, the Centers for Disease Control and Prevention (CDC) has stated: "It is well documented that one of the most important measures to prevent the spread of pathogens is effective hand washing." As a general rule, hand washing protects people poorly or not at all from droplet and airborne diseases, such as measles, chicken pox, influenza, and tuberculosis. It protects best against diseases spread through the fecal-oral route (such as many forms of stomach flu) and direct physical contact (such as impetigo). In addition to washing hands with soap and water, the use of alcohol gel is another form of killing some types of pathogens and healthy bacteria, but its effectiveness is disputed, and may lead to antibiotic-resistant strains of bacteria. In symbolic hand washing, using only water to wash the hands is part of the hand washing ritual characteristic of many religions, including the Baha'i Faith, Hinduism, and tevilah and netilat yadayim in Judaism. Similar to this is the practice of Lavabo in Christianity, Wuduk in Islam and Misogi in Shintō. In their toilets, some people worry about the touch tap because of germs, it is taken from the words of Brad Reynolds, representative of the North American Platform Leader for The Healthy Workplace project, who says that coffee kettles, sink faucets, refrigerators and microwave oven handles and are some of the dirtiest.

1.2 Background Research

Technologies that develop multiply ideas to make it easier for users to enjoy everyday life. Various products that are modified, upgraded and made using different materials, especially the program control system that is included in a product. All these projects are originally done from the thoughts of everyday life. There is no problem when there is a new release that is released because the busyness of people today is very important to something that will make work easier in daily life. Since the covid 19 pandemic has hit the whole world, the thing that can prevent the disease is a great blow for all users to follow, which is to wash their hands regularly and always use disinfectant liquid. From that point it has been shown that many users pay less attention to the correct way of hand washing. With SMART HAND WASH, this will help users wash their hands properly until they are clean and immediately wrap their hands with disinfectant liquid regularly

1.3 Problem Statement

According to the passage of time along with better technology, everything has changed especially in the field of technology, in the health aspect there needs to be improvements in technology. Some people do not wash their hands properly. People wash their hands because they are dirty but do not make sure their hands are perfectly clean with no visible dirt and no bacteria or germs. People do not have deep knowledge about the proper aspects of personal hygiene. Also, some places to wash hands are not attached with hand soap and hand dryers, so they only wash hands with water. In addition, it will cause the use of many tissues and will increase the amount of garbage that can cause it to be less environmentally friendly because of too much garbage and excessive water consumption because consumers do not feel clean satisfaction if they use a small water limit. Then many users do not coat their hands that have been clean, washed and dried with disinfectant or sanitizer liquid, it can further protect the level of hand hygiene before doing any work

1.4 Research Objectives

The main objective of this Project is provide facilities to users, especially the disabled. More specifically the principle objective of this research are:

1. To ensure that users use liquid Sanitizer to help prevent germs after washing their hands cleanly.
2. To reduce user movements when refilling liquid soap and sanitizer without having to open a large part of the product.
3. To design a complete model of automatic hand washing that can be operated automatically and does not complicate the use

1.5 Scope of Research

1) Place:
    a. Hospital and Clinic
    b. Shopping Mall and Super Market.
    c. Workplace and Lab.
    d. Event
2) Target user:
    a. All level age

Monthly maintenance value depends on usage, water, electricity, hand washing soap and disinfectant liquid or sanitizer liquid. Whenever the full allocation at the beginning of the product is created alone, the number is quite large which consumes maybe RM500. but this provision will give a good effect in the long term, In addition to regular maintenance to ensure that the product works well will help reduce the cost of repairing if there is damage.

1.6 Project Significance

Aim of the manual system for washing hands and spraying hand sanitizer separately because there is no automatic system from washing, drying and complete coating with hand sanitizer.

1.7 Chapter Summary

An introduction to the project, which makes it easy for users to wash their hands, dry them and wrap them with disinfectant liquid, can be found in this chapter. I then created a problem statement, project objectives, and project scope for this project after conducting background research

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

This chapter reviews existing project created to get an idea about the project design, conception and any information that related to improve the project. This chapter also explains and discuss about source or article that related to the project. It is consist of the products that have been appeared in the market nowadays. This chapter is also contained the theory of the components, equipments and programming that is used in the project.

2.2 A systematic of hand hygiene improvement strategies (Literature Review Topic 1)

Many strategies have been designed and evaluated to address the problem of low hand hygiene (HH) compliance. Which of these strategies are most effective and how they work is still unclear. Here we describe frequently used improvement strategies and related determinants of behaviour change that prompt good HH behaviour to provide a better overview of the choice and content of such strategies.

2.2.1 Previous Research (Subtopic Literature Review Topic 1)

Systematic searches of experimental and quasi-experimental research on HH improvement strategies were conducted in Medline, Embase, CINAHL, and Cochrane databases from January 2000 to November 2009. First, we extracted the study characteristics using the EPOC Data Collection Checklist, including study objectives, setting, study design, target population, outcome measures, description of the intervention, analysis, and results. Second, we used the Taxonomy of Behavioural Change Techniques to identify targeted determinants

The most frequently addressed determinants were knowledge, awareness, action control, and facilitation of behaviour. Fewer studies addressed social influence, attitude, self-efficacy, and intention. Thirteen studies used a controlled design to measure the effects of HH improvement strategies on HH behaviour. The effectiveness of the strategies varied substantially, but most controlled studies showed positive results. The median effect size of these strategies increased from 17.6 (relative difference) addressing one determinant to 49.5 for the studies that addressed five determinants.

2.3 Control System (Literature Review Topic 2)

A control system makes decisions about how a discrete, continuous or hybrid processes function, generally ensuring processes operate within appropriate parameters, safely, at an appropriate rate and within required quality. Control systems help factories and facilities produce quality goods safely and efficiently. Open-loop control is when the output (decision) doesn't feed back into the control loop. Closed-loop control uses the output to influence, or provide feedback for, the next decision. Control systems can include hardware and software for programmable logic controllers (PLCs), programmable automation controllers (PACs), embedded systems and edge computing, dedicated controls, proportional-integral-derivative (PID) and advanced process controls (APC), along with distributed control systems (DCS), supervisory controls and data acquisition (SCADA) and other controllers, such as industrial PCs (iPCs).

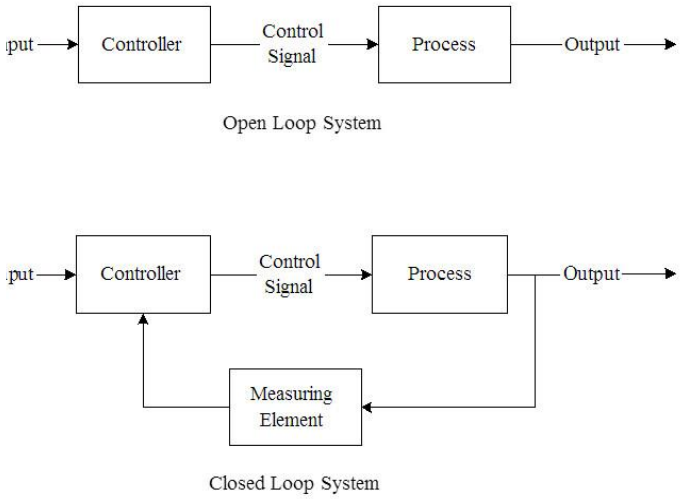


Figure 0.1: Block diagram of open loop and closed loop system

2.3.1 Microcontroller

A microcontroller is an integrated circuit (IC) device used for controlling other portions of an electronic system, usually via a microprocessor unit (MPU), memory, and some peripherals. These devices are optimized for embedded applications that require both processing functionality and agile, responsive interaction with digital, analog, or electromechanical components.

The most common way to refer to this category of integrated circuits is “microcontroller" but the abbreviation “MCU” is used interchangeably as it stands for “microcontroller unit”. You may also occasionally see “µC” (where the Greek letter mu replaces “micro”).

“Microcontroller” is a well-chosen name because it emphasizes defining characteristics of this product category. The prefix “micro” implies smallness and the term "controller" here implies an enhanced ability to perform control functions. As stated above, this functionality is the result of combining a digital processor and digital memory with additional hardware that is specifically designed to help the microcontroller interact with other components.

2.3.2 Programmable Logic Control (PLC)

A programmable logic controller is a type of tiny computer that can receive data through its inputs and send operating instructions through its outputs. Fundamentally, a PLC's job is to control a system's functions using the internal logic programmed into it. Businesses around the world use PLCs to automate their most important processes. A PLC takes in inputs, whether from automated data capture points or from human input points such as switches or buttons. Based on its programming, the PLC then decides whether or not to change the output. A PLC's outputs can control a huge variety of equipment, including motors, solenoid valves, lights, switchgear, safety shut-offs and many others.

The physical location of PLCs can vary widely from one system to another. Usually, however, PLCs are located in the general vicinity of the systems they operate, and they're typically protected by a surface mount electrical box. Skip to the end if you're interested in seeing the electrical junction boxes that help protect PLCs.

PLCs largely replaced the manual relay-based control systems that were common in older industrial facilities. Relay systems are complex and prone to failure and, in the 1960s, the inventor Richard Morley introduced the first PLCs as an alternative. Manufacturers quickly realized the potential of PLCs and began integrating them into their work processes.

Today, PLCs are still a fundamental element of many industrial control systems. In fact, they're still the most used industrial control technology worldwide. The ability to work with PLCs is a required skill for many different professions, from the engineers designing the system to the electrical technicians maintaining it.

2.3.3 Arduino

Arduino is an open-source platform used for building electronics projects. Arduino consists of both a physical programmable circuit board (often referred to as a microcontroller) and a piece of software, or IDE (Integrated Development Environment) that runs on your computer, used to write and upload computer code to the physical board.

The Arduino platform has become quite popular with people just starting out with electronics, and for good reason. Unlike most previous programmable circuit boards, the Arduino does not need a separate piece of hardware (called a programmer) in order to load new code onto the board -- you can simply use a USB cable. Additionally, the Arduino IDE uses a simplified version of C++, making it easier to learn to program. Finally, Arduino provides a standard form factor that breaks out the functions of the micro-controller into a more accessible package.

2.4 Chapter Summary

This chapter discusses the literature reviews of five journals that I discovered to be relevant to this study. One Atmel Atmega328p, one microcontroller, and the other Arduino were used from this five journals.

CHAPTER 3
RESEARCH METHODOLOGY

3.1 Introduction

Each item produced necessarily has its own design. Appropriate design for an object, including electronic circuits, hardware and so it is important to ensure that it is attractive and easy to use for a particular purpose.

Making of the projects should have rules or procedures used to carry out and can be completed in a certain time with a neat and perfect.

3.2 Project Design and Overview.

The circuit for the system in this program is using arduino uno which is an easy program to operate and an organized system.

This is where the process begins with the user putting his hand into the sensor chamber, the sensor will provide information directly to the first sequence which is to release water for the user to wet their hands. Then the program will continue to the production of soap and will give a time period of a few seconds before releasing the rinse water which will ensure that the user rinses their hands from the soap and then clean. But this alone is not finished, where the next program will switch to a drying system from a hand dryer. This is where this machine works to dry hands without using tissues to ensure that the accumulation of waste can be reduced, so this product will be in an environmentally friendly product because it does not add to environmental pollution when it does not use a lot of tissue because it has dried hands with a hand dryer. Then, the hands that have been dried will continue with the program to produce liquid hand sanitizer to ensure that every user wraps their clean hands with disinfectant liquid to provide longer prevention from bacterial and germ infections.

This product is also not complicated to use because there are no user specification features to use this product. It will form a simple product but works well.

3.2.1 Block Diagram of the Project

Figure 3.2.1: Block diagram of operation of the system

3.2.2 Flowchart of the Project 2

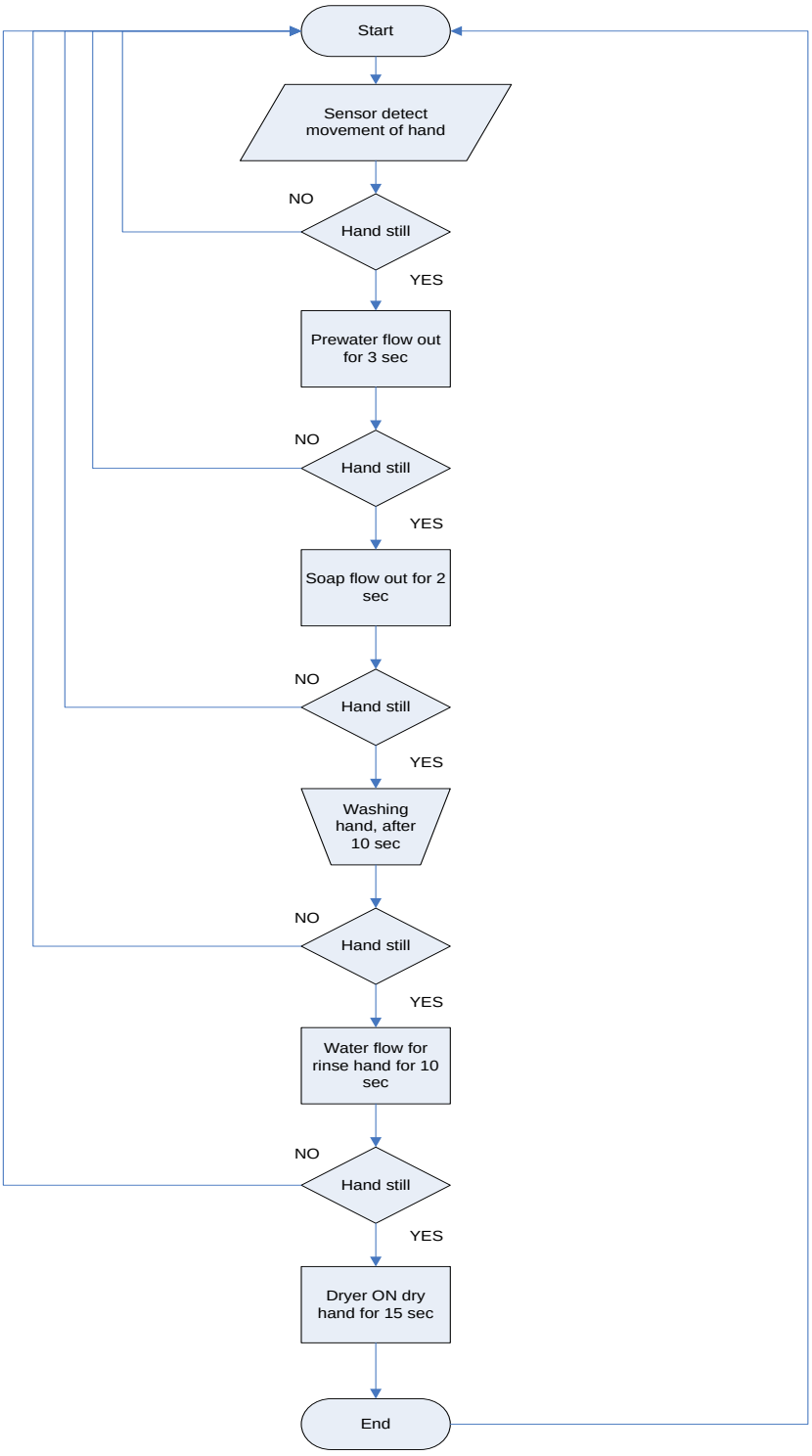


Figure 0.1: Flow chart of operation of the system
*Images may be subject to copyright

3.2.3 Project Description

3.3 Project Hardware

As mentioned in the chapter above, the controller was designed using an Arduino uno. This microcontroller recognises a program, reports the results, and manages push buttons, buzzers, LCDs, and the entire project's workflow. The entireprocess is managed by an Arduino Uno.

3.3.1 Schematic Circuit

Figure 0.1 shows the overall circuit diagram of this Project **Smart Automatic Hand wash**

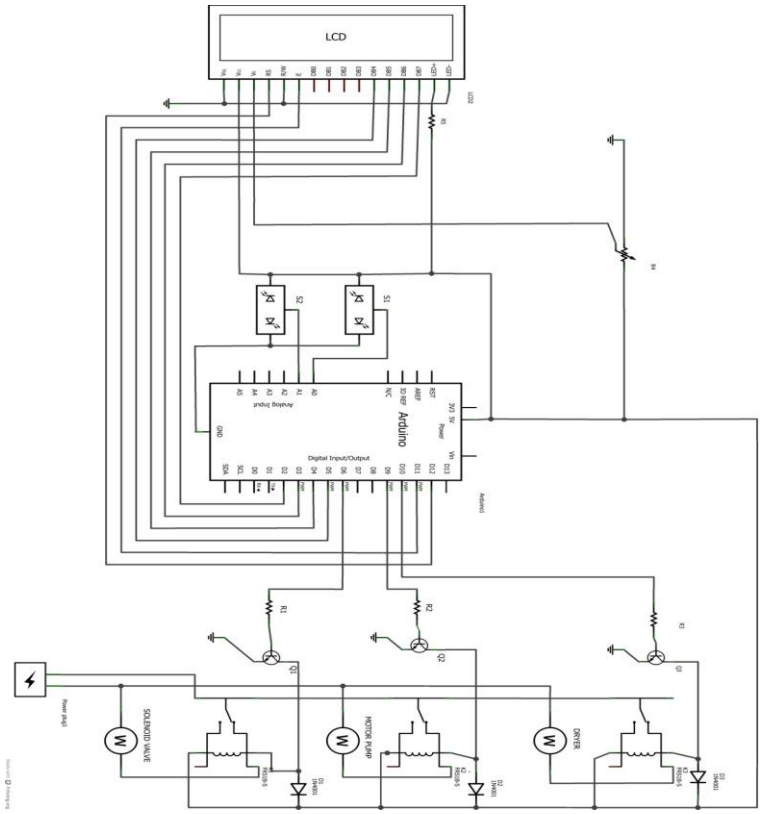
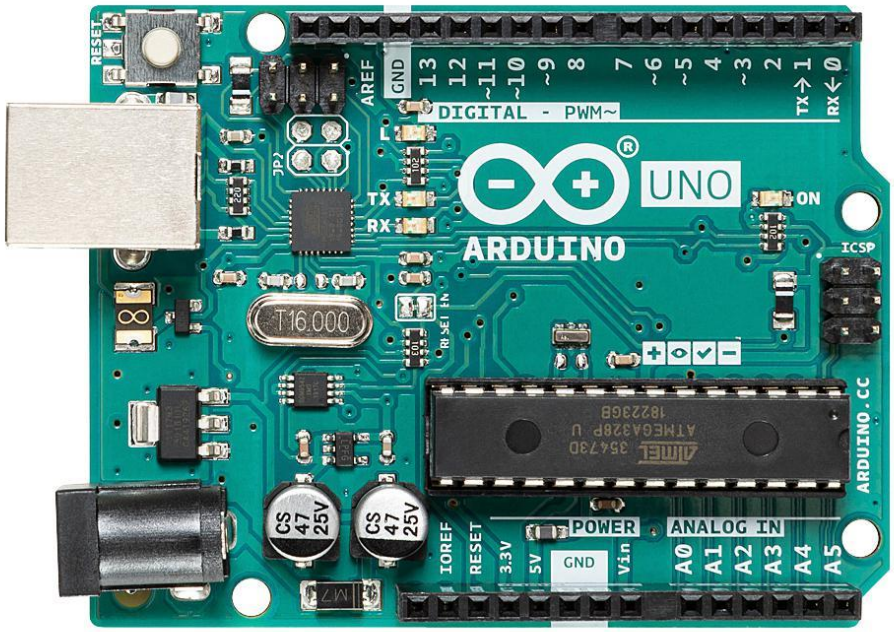


Figure 0.1: Circuit Diagram

*Images may be subject to copyright

3.3.2 Description of Main Component

ARDUINO UNO



Arduino UNO is a low-cost, flexible, and easy-to-use programmable open-source microcontroller board that can be integrated into a variety of electronic projects. This board can be interfaced with other Arduino boards, Arduino shields, Raspberry Pi boards and can control relays, LEDs, servos, and motors as an output.

3.3.2.1 Component 1 (LCD)

A flat-panel display or other electronically manipulated optical device that makes useof liquid crystals' ability to modulate light is known as a liquid-crystal display (LCD). Liquid crystals don't directly emit light; instead, they create images in either colour or monochrome via a backlight or reflector. There are LCDs that can show arbitrary graphics (as on a general-purpose computer display) or fixed images with little information that may be seen or hidden, such text, numbers, and seven-segment displays like those used in digital clocks. They both make use of the same fundamental technology, however different displays have larger elements whereas random images are made up of a lot of tiny pixels. Depending on the polarizer configuration, LCDs can be switched between being normally on (positive) and off (negative). A character negative LCD will have a black backdrop with letters that arethe same colour as the backlight, while a character positive LCD will have black writing on a background that is the opposite of the colour of the illumination. Blue

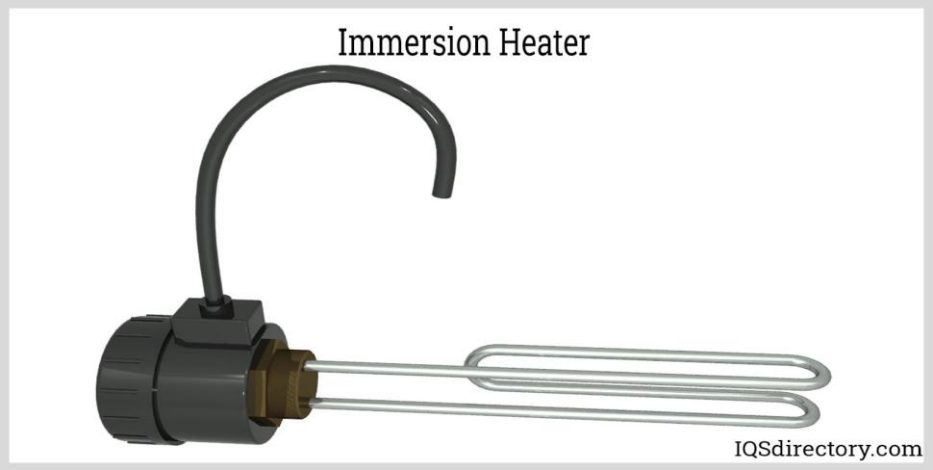
3.3.2.2 Component 2 (SOLENOID VALVE)

Solenoid valve function involves either opening or closing an orifice in a valve body, which either allows or prevents flow through the valve. A plunger opens or closes the orifice by raising or lowering within a sleeve tube by energizing the coil. Solenoid valves consist of a coil, plunger and sleeve assembly.

3.3.2.3 Component 3 (FAN MOTOR)

Fans and their motors have become indispensable in modern industrial plants. Whether for ventilation of warehouses, cold stores for cooling or just for fresh air – fan motors are everywhere. The various fans available hardly differ in terms of function, but rather in their area and in the area of use. It is easy to recognize that a fan for cooling must meet other requirements as a fan for air-conditioning systems. Further attention should be paid to the control and energy efficiency. For new regulations, for example by frequency inverters, the energy consumption is reduced, and the life of the fan motors is also prolonged.

3.3.2.4 Component 4 (HEAT ELEMENT)



A heating element is a material or device that directly converts electrical energy into heat or thermal energy through a principle known as Joule heating. Joule heating is the phenomenon where a conductor generates heat due to the flow of electric current. As the electric current flows through the material, electrons or other charge carriers collide with the ions or atoms of the conductor creating friction at an atomic scale. This friction then manifests as heat. Joule‘s first law (Joule-Lenz law) is used to describe the amount of heat produced from the flow of electricity in a conductor

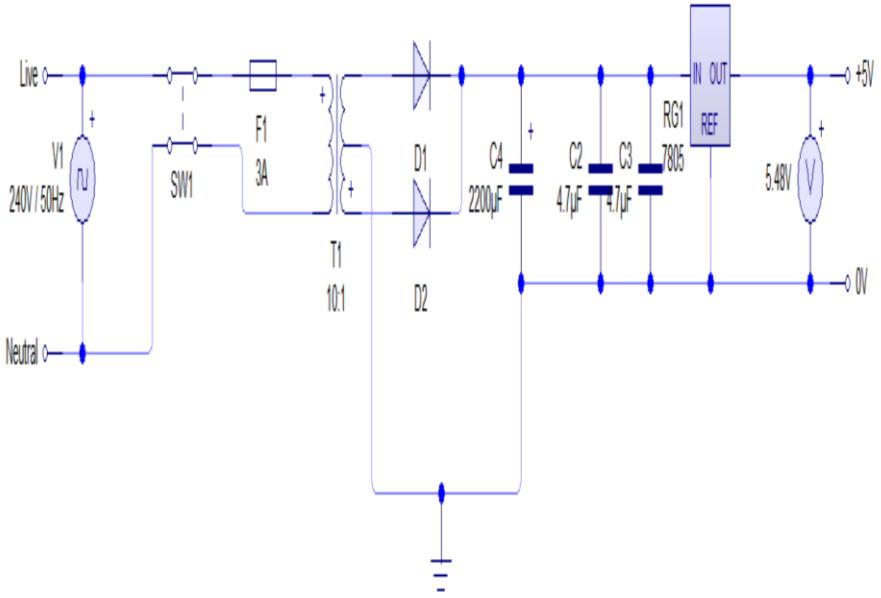
3.3.2.5 Component 5 (PUMP(INCLUDE MOTOR))

A pump is a device that moves fluids (liquids or gases), or sometimes slurries, by mechanical action, typically converted from electrical energy into hydraulic energy. Pumps can be classified into three major groups according to the method they use to move the fluid: direct lift, displacement, and gravity pumps. An electric motor is a device used to convert electricity into mechanical energy—opposite to an electric generator. They operate using principles of electromagnetism, which shows that a force is applied when an electric current is present in a magnetic field.

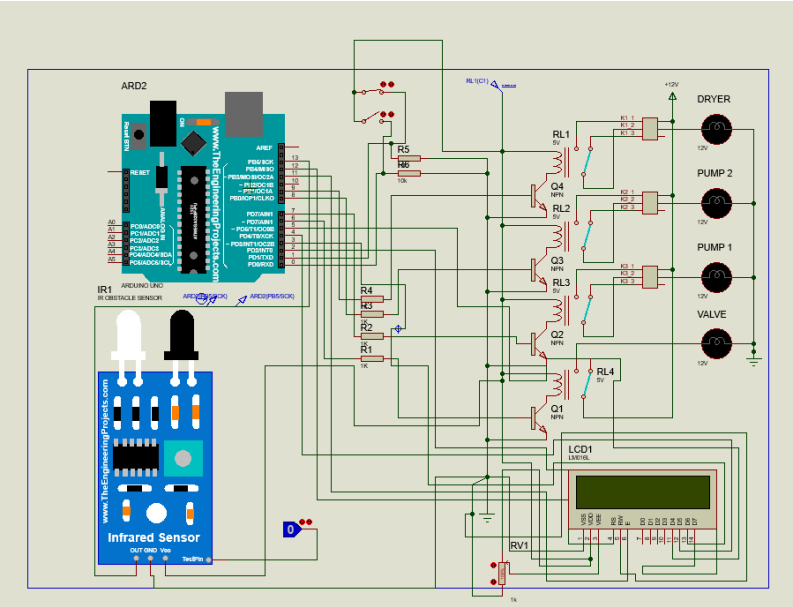
3.3.2.6 Component 3 (IR SENSOR)

An infrared sensor (IR sensor) is a radiation-sensitive optoelectronic component with a spectral sensitivity in the infrared wavelength range 780 nm … 50 µm. IR sensors are now widely used in motion detectors, which are used in building services to switch on lamps or in alarm systems to detect unwelcome guests. In a defined angle range, the sensor elements detect the heat radiation (infrared radiation) that changes over time and space due to the movement of people. Such infrared sensors only have to meet relatively low requirements and are low-cost mass-produced items. InfraTec does not supply such products, InfraTec develops, produces and sells pyroelectric detectors.

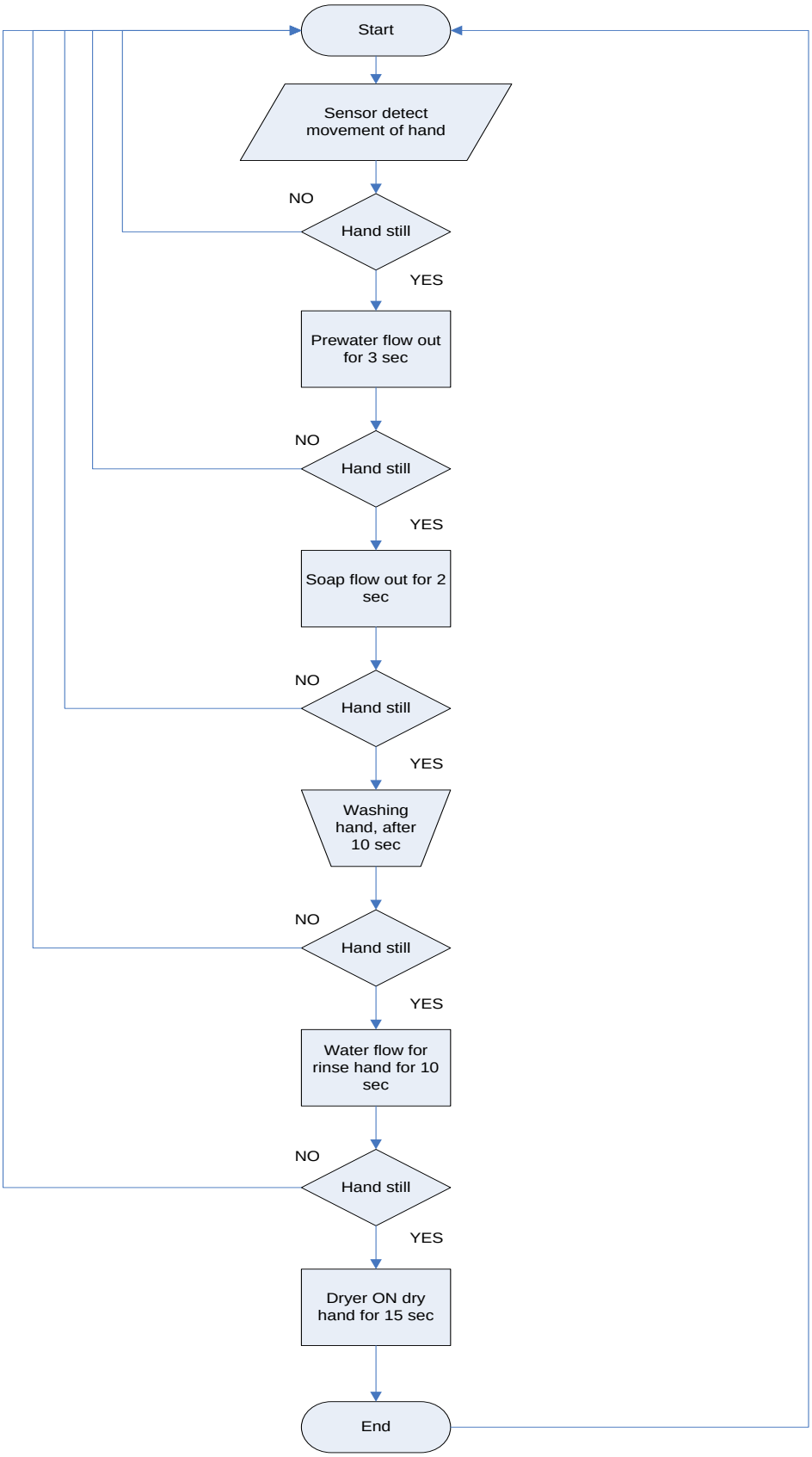
3.3.3 Circuit Operation



3.4 Project Software



3.4.1 Flowchart of the System



3.4.2 Description of Flowchart

1. Sensor detect movement of hand
   - IR sensor will detect movement and send data to microcontroller.

2. Hand still
   - IR sensor still detect movement of hand and continue to next step; prewater

3. Prewater flow out for 3 sec
   - Prewater will flow out for 3second based on timer that programmed in microcontroller

4. Hand still
   - IR sensor still detect movement of hand and continue to next step; soap

5. Soap flow out for 2 sec
   - Soap flow out for 2 second based on timer that programmed in microcontroller

6. Hand still
   - IR sensor still detect movement of hand and continue to next step; washing hand

7. Washing hand, after 10 sec
   Users need to wash their hand manually and after 10 second water will flow out.

8. Hand still
   - IR sensor still detect movement of hand and continue to next step; water

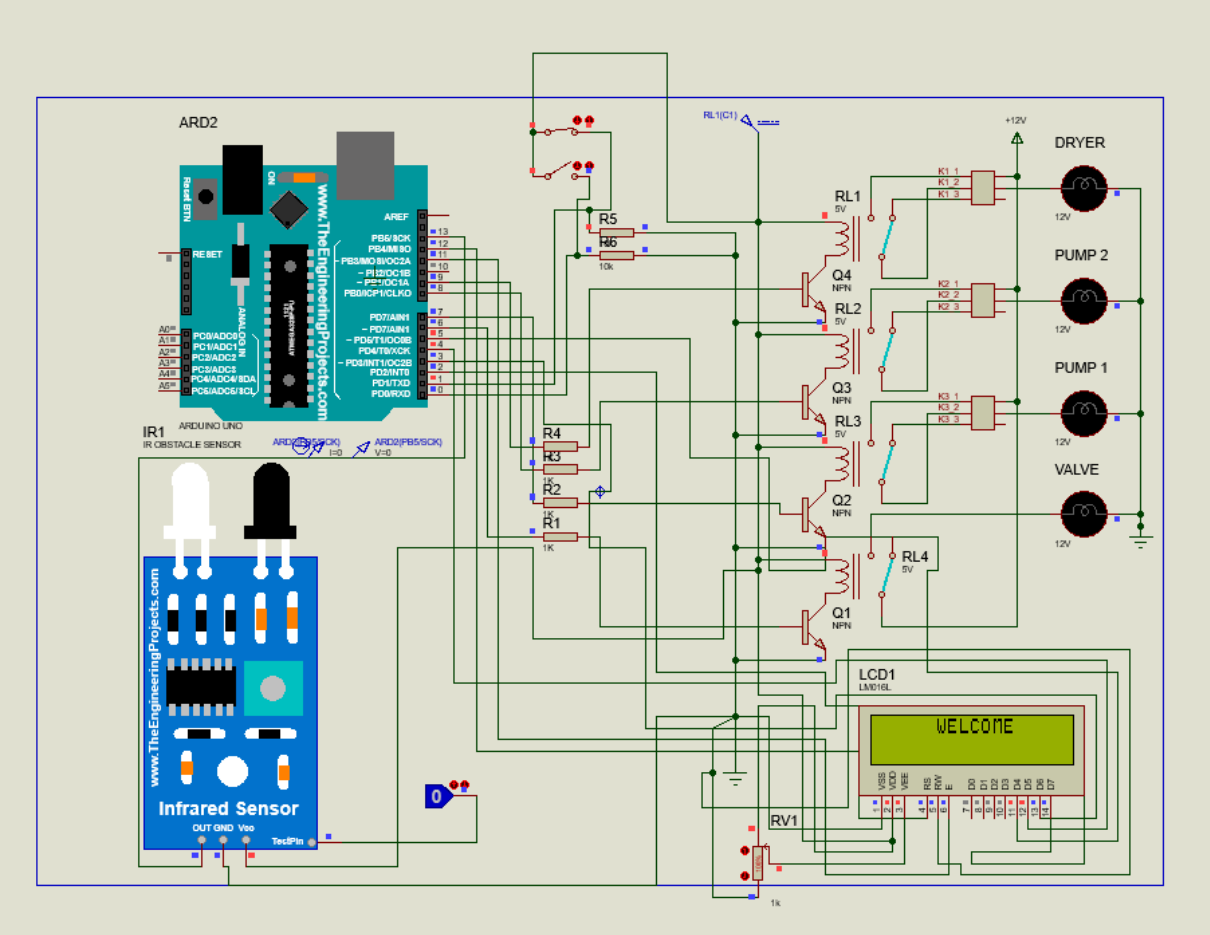
9. Water flow for rinse hand for 10 sec
   - Water flow out for 10 second based on timer that programmed in microcontroller

10. Hand still
    - IR sensor still detect movement of hand and continue to next step; dryer

11. Dryer ON dry hand for 15 sec
    - Dryer turn ON for 15 second based on timer that programmed in microcontroller

12. Hand Sanitizer
    - IR sensor still detect movement of hand and continue to next step; hand sanitizer

3.5 Prototype Development



3.5.1 Mechanical Design/Product Layout

Figure 0.2 shows the design of the product Smart Automatic Hand Wash

Figure 0.2: Front view of the Project

3.6 **Sustainability Element in The Design Concept**

In this smart automatic hand wash product, it is not combined with polluting uses such as tissues. The use of tissues is not required when users use this product to ensure dry hands after washing hands and using hand sanitizer. this is because some tissue paper products contain BPA or Bisphenol-A which is harmful to health. BPA is a chemical used by factories in the manufacture of plastics, and various types of paper. Therefore, reducing the use of tissues can reduce the accumulation of waste that is too high and protect users from being affected by any disease due to the materials contained in the manufacture of tissues.

3.7 Chapter Summary

The project's research methodology is covered in this chapter. I've included the project's block diagram, project description, hardware, circuit diagram, component description, circuit operation, project flowchart, and flowchart description in this study technique.

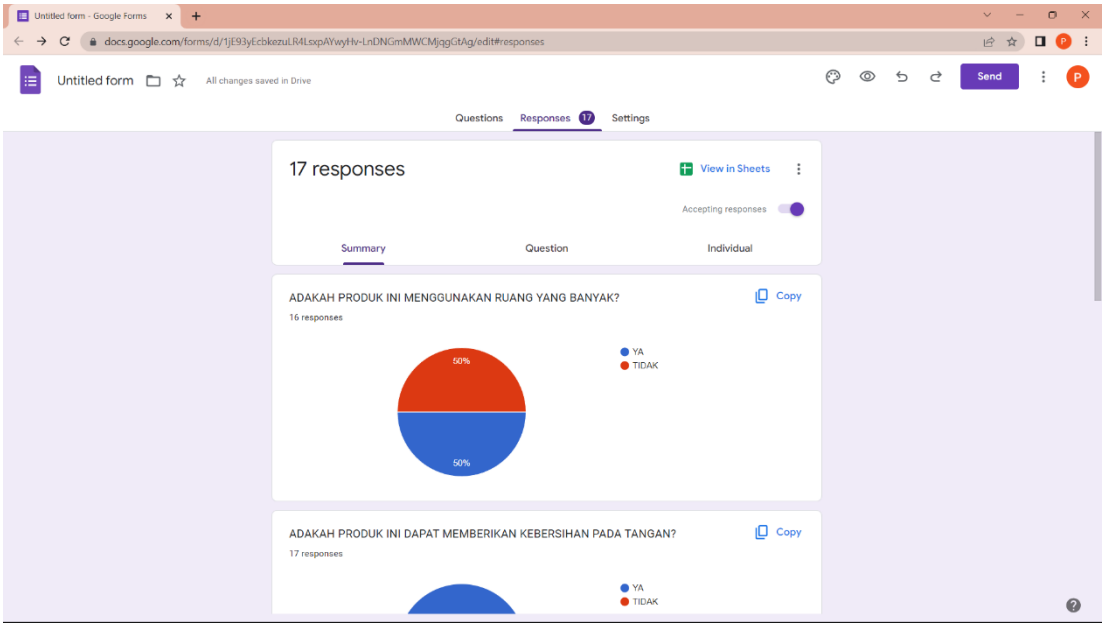
CHAPTER 4

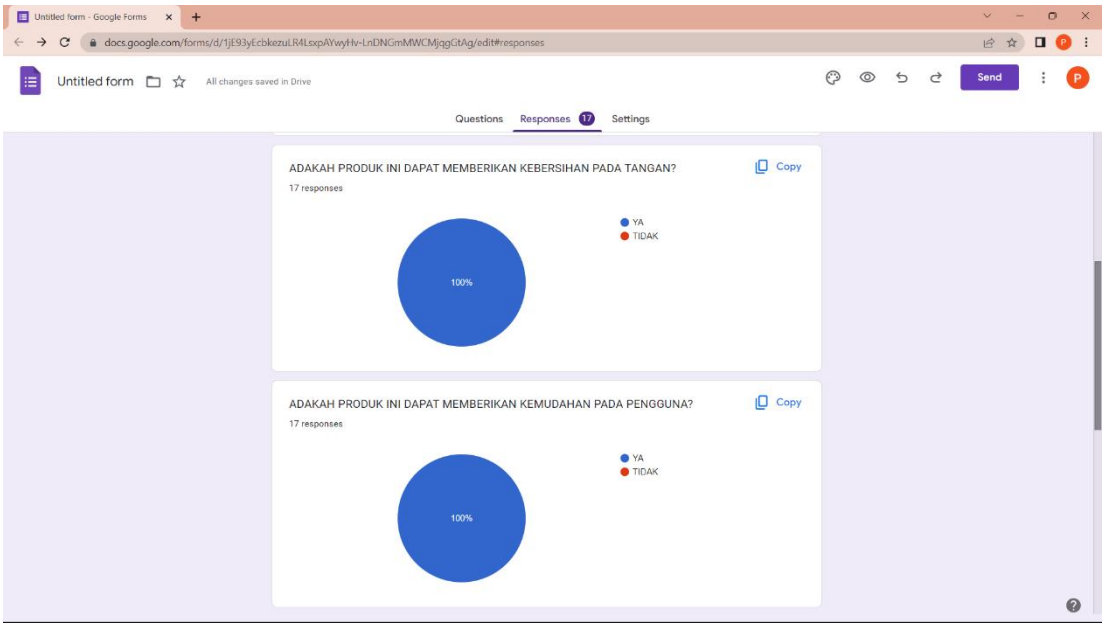
RESULTS AND DISCUSSION

4.1 Introduction

The steps taken in the observation to examine every point of view from the user have already been implemented. The next step is to place the product in one place for a period of time and ensure that users give feedback on their improvement or acceptance of this Smart Automatic Handwash. It is digitally recorded by creating a google form that is entered by scanning a QR code.

4.2 Results and Analysis

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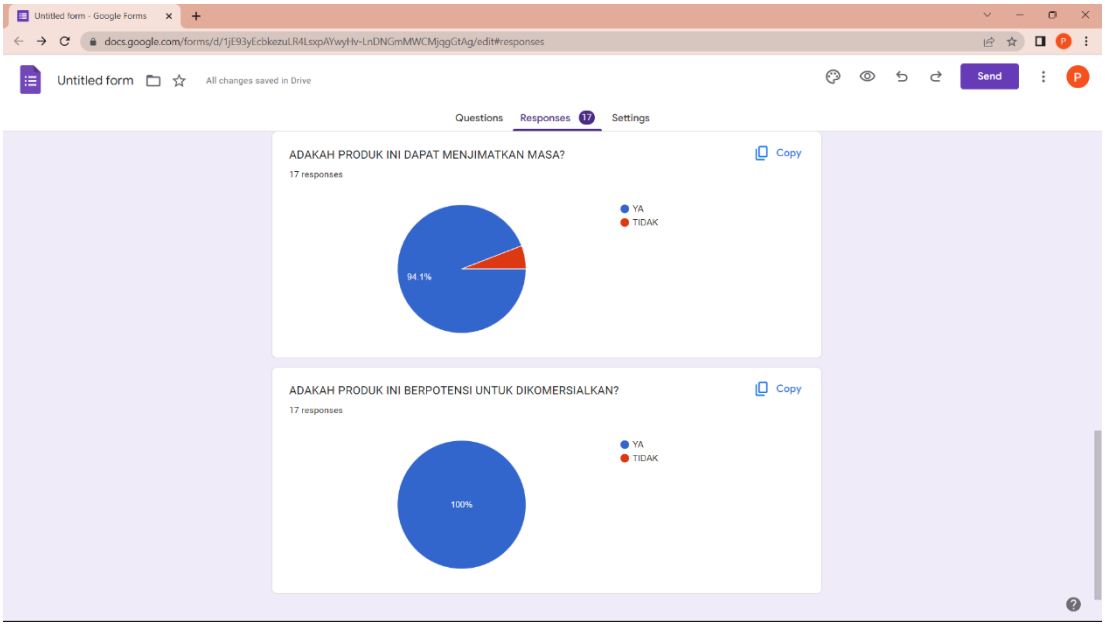
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4.3 Discussion

All respondents gave different feedback. From the results, some steps can be taken as a way to improve in the future. Each of them gave feedback after trying to use the Smart Automatic HandcWash product. Smart Automatic Hand Wash is a new tool that wants to be given full support to ensure that the product can get a high marketability scope for the common good. Considering that more and more infectious diseases involve contact, in this way the responsible party may help reduce the spread and help the special group by making it easier for them to stay hygienic without needing a lot of movement and will reduce the risk of harm.

4.4 Chapter Summary

The project's results and discussion is covered in this chapter. I've included the project's introduction, results and analysis, and discussion.

CHAPTER 5

CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

All studies play an important role to produce a conclusion, before the conclusion and discussion. it is the result of observation from each part to examine the available conclusions. For example, all products have been designed but all of them are isolated with their own functions. There is no special combination as completely designed as the Smart Automatic Handwash that has been created.

5.2 Conclusion

The preferred embodiment of the Automatic Hand Wash is unvention solves the aforementioned problems in a straight forward and simple manner. What is provided is Automatic Hand Wash for washing and drying the hand also moisturizing the hand without touching anything switch or faucet. Automatic Hand Wash also provide which functions to automatically appropriate a predetermined amount of soap, water and air within place for washing and drying hand. This device having a sensor for determining when the hands of user put the hand over the sensor and contol unit will controlling the timed cycles of the hand washing process, soap process, and drying process. The device provide hand washing and drying which serves to conserve water and eliminates the need for unsanitary hands to touch the soap dispenser mechanism, eliminates the need to manually turn water faucets on or off, and eliminates the spread of bacteria or diseases on hand. This device also minimum the usage of water and tissue. All process in this device was be set up and process will running based on system that was set up. Indirectly can reduce water and tissue usage and also can avoid waste of water and soap.Overall for this project was successfull and all process was running based on procedure. With the availability of the device hopefully will make people life daily become easy and faster.

5.3 Suggestion for Future Work

This project is an inovation from original device. This project was upgrade LCD for add-ons that use to display process which in running. If a old device use boiling as dryer but in this project was used dryer for dry user hand. Microcontroller also add-ons because this component will controll all process in this project.

Recomendation for this project in next time is this project will make as a portable that can use at everywhere in everytime that need. Another else, fan dryer for next time project can upgrade more fast because fan dryer in this project not perform fast to spread hot air for dry a hand. One more is model for this project can design more smaller than this project. It also can connect to the direct pipe in house or everywhere that need to use this project.

Hopefully this recomendation will be useful to upgrade Automatic Handwash. This machine should be user-friedly and portable for upgrade healthy in daily life.

5.4 Chapter Summary

The project's conclusion and recommendatioc is covered in this chapter. I've included the project's introduction, comclution and suggestion for future work.

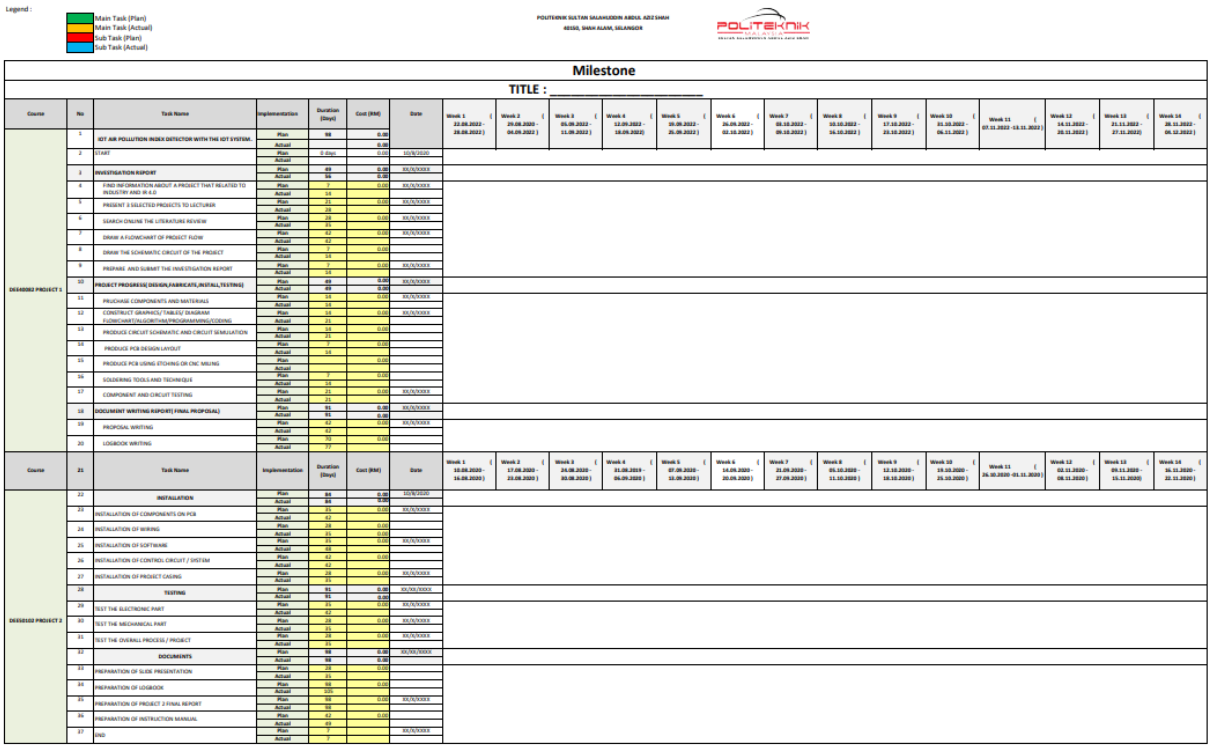
CHAPTER 6

PROJECT MANAGEMENT AND COSTING

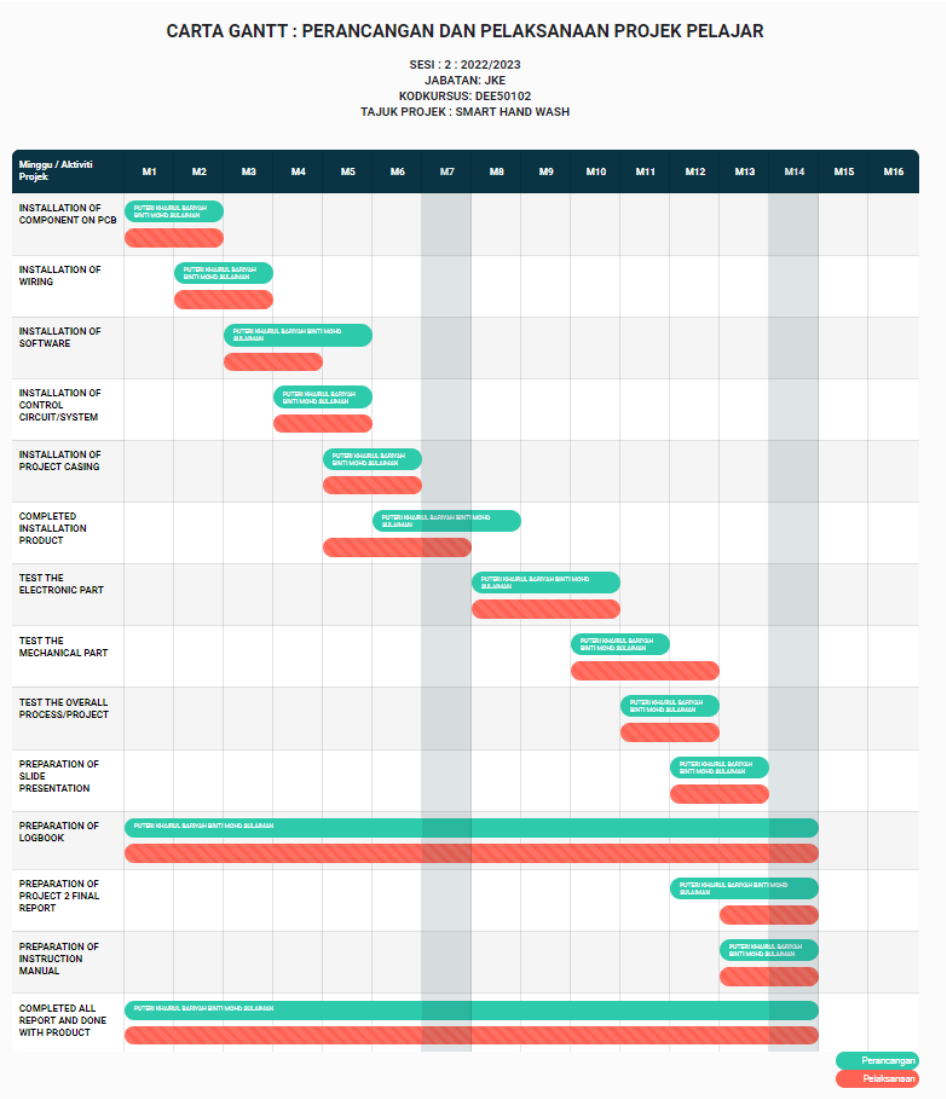
6.1 Introduction

Because we didn't have a sponsor, we had to use our own money to buy most of the essential components and supplies for the project. Estimated price is RM500.00. Compared to other projects, the cost is much lower than the budget. Development costs are still manageable for the next five months. Research shows that it is possible and achievable.

6.2 Gant Chart and Activities of the Project



6.3 Milestone



6.4 Cost and Budgeting

This project involves the cost of purchasing components and materials throughout its implementation. components involving cost are hardware Arduino set, sink, Solenoid Valve, Fan Motor, Heat Element, IR Sensor. All of these components are purchased through online purchase methods to make it easier as well as save on costs.

The overall gross budget estimate in the implementation of this project is RM 400 and other expenses is at RM 100 as shown in Table 1 According to this budget cost, this project is can be considered as a less costly project compared to other projects that can cost over a thousand ringgit. The cost of the project is also in line with one of the key features of a good project developer that is low cost but have a high quality project.

No.	Component and materials	The unit price	Quantity	Total
1	Arduino set	RM 23.50	1	RM 96.60
2	Sink	RM 2.00	1	RM60.30
3	LCD	RM 30.00	1	RM 25.00
4	Solenoid Valve	RM 19.40	1	RM 34.80
5	Fan Motor	RM 5.90	1	RM 28.70
6	Heat Element	RM 47.00	1	RM30.00
7	Pump(include motor)	RM 30	1	RM 47.40
8	IR Sensor	RM 7.90	1	RM 15.80
9	Other materials	RM 50	-	RM 61.40
			Total :	**RM 400**
	List of other costing			
1	Transportation			
2	Postage			
3	Craft Work			
4	Internet			
5	Application			
			Total :	**RM500**
			Overall total	**RM500.00**

6.5 Chapter Summary

Costing and project management have both been covered in this chapter. A ganttchart and the project's operations are given. The project's cost and budget list, complete with component quantities and the amount, is also included.

REFERENCES

1) Gunther Eysenbach. (2020 Mar 26). Accurate Measurement of Handwash Quality Using Sensor Armbands(online). Available : https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7146248/

2) Elke Hacker. (Oct 21,2020). Deployment of a smart handwashing station on a school setting during the covid 19 pandemic(Online)Available : https://www.comminit.com/content/deployment-smart-handwashing-station-school-setting-during-covid-19-pandemic-field-study

3) Pallavi Singh (July 19,2020). Hand Sanitizer An Alternative To Hand Wahing(Online). Available : https://journals.sagepub.com/doi/full/10.1177/2320206820939403

4) xiaomify(2018). Xiaomi Mijia Automatic Soap Dispenser [xiaomify] (Youtube). Available : https://youtu.be/c6fvJdUFyvg

5) Global Industrial(2020). Global Industrial™ Automatic Hand Sanitizer/Liquid Soap Dispenser(Youtube). Available: https://youtu.be/7iZ8yuaJJaQ

6) Peggy Netwrok(2021). Automatic Hand Wash Dispenser - Best Liquid Hand Soap Dispenser(Youtube). Available: https://youtu.be/l4FZbBQu00A

APPENDICES

APPENDIX A- DATA SHEET

Product Reference Manual
SKU: A000066

Description

The Arduino UNO R3 is the perfect board to get familiar with electronics and coding. This versatile microcontroller is equipped with the well-known ATmega328P and the ATMega 16U2 Processor.
This board will give you a great first experience within the world of Arduino.

Target areas:

Maker, introduction, industries

Features

- **ATMega328P** Processor
  - **Memory**
    - AVR CPU at up to 16 MHz
    - 32KB Flash
    - 2KB SRAM
    - 1KB EEPROM
  - **Security**
    - Power On Reset (POR)
    - Brown Out Detection (BOD)
  - **Peripherals**
    - 2x 8-bit Timer/Counter with a dedicated period register and compare channels
    - 1x 16-bit Timer/Counter with a dedicated period register, input capture and compare channels
    - 1x USART with fractional baud rate generator and start-of-frame detection
    - 1x controller/peripheral Serial Peripheral Interface (SPI)
    - 1x Dual mode controller/peripheral I2C
    - 1x Analog Comparator (AC) with a scalable reference input
    - Watchdog Timer with separate on-chip oscillator
    - Six PWM channels
    - Interrupt and wake-up on pin change
- **ATMega16U2 Processor**
  - 8-bit AVR® RISC-based microcontroller
- **Memory**
  - 16 KB ISP Flash
  - 512B EEPROM
  - 512B SRAM
  - debugWIRE interface for on-chip debugging and programming
- **Power**
  - 2.7-5.5 volts

CONTENTS

1 The Board

1.1 Application Examples

The UNO board is the flagship product of Arduino. Regardless if you are new to the world of electronics or will use the UNO as a tool for education purposes or industry-related tasks.

First entry to electronics: If this is your first project within coding and electronics, get started with our most used and documented board; Arduino UNO. It is equipped with the well-known ATmega328P processor, 14 digital input/output pins, 6 analog inputs, USB connections, ICSP header and reset button. This board includes everything you will need for a great first experience with Arduino.

Industry-standard development board: Using the Arduino UNO board in industries, there are a range of companies using the UNO board as the brain for their PLC's.

Education purposes: Although the UNO board has been with us for about ten years, it is still widely used for various education purposes and scientific projects. The board's high standard and top quality performance makes it a great resource to capture real time from sensors and to trigger complex laboratory equipment to mention a few examples.

1.2 Related Products

- Starter Kit
- Tinkerkit Braccio Robot
- Example

2 Ratings

2.1 Recommended Operating Conditions

Symbol	Description	Min	Max
	Conservative thermal limits for the whole board:	-40 °C (-40°F)	85 °C (185°F)

NOTE: In extreme temperatures, EEPROM, voltage regulator, and the crystal oscillator, might not work as expected due to the extreme temperature conditions

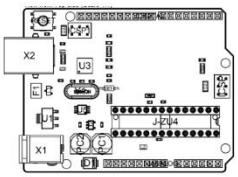
2.2 Power Consumption

Symbol	Description	Min	Typ	Max	Unit
VINMax	Maximum input voltage from VIN pad	6	-	20	V
VUSBMax	Maximum input voltage from USB connector	-	-	5.5	V
PMax	Maximum Power Consumption	-	-	xx	mA

3 Functional Overview

3.1 Board Topology

Top view



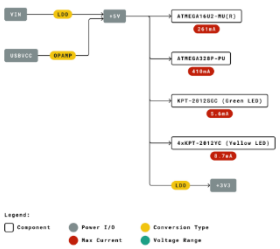
Board topology

Ref.	Description	Ref.	Description
X1	Power jack 2.1x5.5mm	U1	SPX1117M3-L-5 Regulator
X2	USB B Connector	U3	ATMEGA16U2 Module
PC1	EEE-1EA470WP 25V SMD Capacitor	U5	LMV358LIST-A 9 IC
PC2	EEE-1EA470WP 25V SMD Capacitor	F1	Chip Capacitor, High Density
D1	CGRA4007-G Rectifier	ICSP	Pin header connector (through hole 6)
J-ZU4	ATMEGA328P Module	ICSP1	Pin header connector (through hole 6)
Y1	ECS-160-20-4X-DU Oscillator		

3.2 Processor

The Main Processor is a ATmega328P running at up to 20 MHz. Most of its pins are connected to the external headers, however some are reserved for internal communication with the USB Bridge coprocessor.

3.3 Power Tree



Power tree

4 Board Operation

4.1 Getting Started - IDE

If you want to program your Arduino UNO while offline you need to install the Arduino Desktop IDE [1] To connect the Arduino UNO to your computer, you'll need a Micro-B USB cable. This also provides power to the board, as indicated by the LED.

4.2 Getting Started - Arduino Web Editor

All Arduino boards, including this one, work out-of-the-box on the Arduino Web Editor [2], by just installing a simple plugin.

The Arduino Web Editor is hosted online, therefore it will always be up-to-date with the latest features and support for all boards. Follow [3] to start coding on the browser and upload your sketches onto your board.

4.3 Getting Started - Arduino IoT Cloud

All Arduino IoT enabled products are supported on Arduino IoT Cloud which allows you to Log, graph and analyze sensor data, trigger events, and automate your home or business.

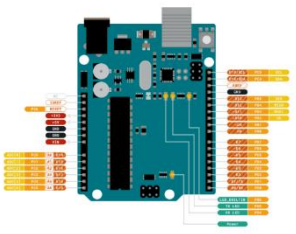
4.4 Sample Sketches

Sample sketches for the Arduino XXX can be found either in the "Examples" menu in the Arduino IDE or in the "Documentation" section of the Arduino Pro website [4].

4.5 Online Resources

Now that you have gone through the basics of what you can do with the board you can explore the endless possibilities it provides by checking exciting projects on Project Hub [5], the Arduino Library Reference [6] and the online store [7] where you will be able to complement your board with sensors, actuators and more.

5 Connector Pinouts



Pinout

5.1 JANALOG

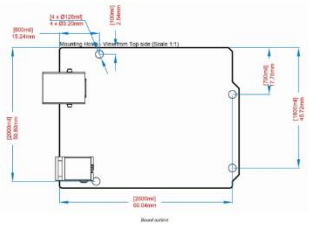
Pin	Function	Type	Description
1	NC	NC	Not connected
2	IOREF	IOREF	Reference for digital logic V - connected to 5V
3	Reset	Reset	Reset
4	+3V3	Power	+3V3 Power Rail
5	+5V	Power	+5V Power Rail
6	GND	Power	Ground
7	GND	Power	Ground
8	VIN	Power	Voltage Input
9	A0	Analog/GPIO	Analog input 0 /GPIO
10	A1	Analog/GPIO	Analog input 1 /GPIO
11	A2	Analog/GPIO	Analog input 2 /GPIO
12	A3	Analog/GPIO	Analog input 3 /GPIO
13	A4/SDA	Analog input/I2C	Analog input 4/I2C Data line
14	A5/SCL	Analog input/I2C	Analog input 5/I2C Clock line

5.2 JDIGITAL

Pin	Function	Type	Description
1	D0	Digital/GPIO	Digital pin 0/GPIO
2	D1	Digital/GPIO	Digital pin 1/GPIO
3	D2	Digital/GPIO	Digital pin 2/GPIO
4	D3	Digital/GPIO	Digital pin 3/GPIO
5	D4	Digital/GPIO	Digital pin 4/GPIO
6	D5	Digital/GPIO	Digital pin 5/GPIO
7	D6	Digital/GPIO	Digital pin 6/GPIO
8	D7	Digital/GPIO	Digital pin 7/GPIO
9	D8	Digital/GPIO	Digital pin 8/GPIO
10	D9	Digital/GPIO	Digital pin 9/GPIO
11	SS	Digital	SPI Chip Select
12	MOSI	Digital	SPI Main Out Secondary In
13	MISO	Digital	SPI Main In Secondary Out
14	SCK	Digital	SPI serial clock output
15	GND	Power	Ground
16	AREF	Digital	Analog reference voltage
17	A4/SDA	Digital	Analog input 4/I2C Data line (duplicated)
18	A5/SDS	Digital	Analog input 5/I2C Clock line (duplicated)

5.3 Mechanical Information

5.4 Board Outline & Mounting Holes



6 Certifications

6.1 Declaration of Conformity CE DoC (EU)

We declare under our sole responsibility that the products above are in conformity with the essential requirements of the following EU Directives and therefore qualify for free movement within markets comprising the European Union (EU) and European Economic Area (EEA).

ROHS 2 Directive 2011/65/EU	
Conforms to:	EN50581:2012
Directive 2014/35/EU. (LVD)	
Conforms to:	EN 60950-1:2006/A11:2009/A1:2010/A12:2011/AC:2011
Directive 2004/40/EC & 2008/46/EC & 2013/35/EU. EMF	
Conforms to:	EN 62311:2008

6.2 Declaration of Conformity to EU RoHS & REACH 211 01/19/2021

Arduino boards are in compliance with RoHS 2 Directive 2011/65/EU of the European Parliament and RoHS 3 Directive 2015/863/EU of the Council of 4 June 2015 on the restriction of the use of certain hazardous substances in electrical and electronic equipment.

Substance	Maximum limit (ppm)
Lead (Pb)	1000
Cadmium (Cd)	100
Mercury (Hg)	1000
Hexavalent Chromium (Cr6+)	1000
Poly Brominated Biphenyls (PBB)	1000
Poly Brominated Diphenyl ethers (PBDE)	1000
Bis(2-Ethylhexyl) phthalate (DEHP)	1000
Benzyl butyl phthalate (BBP)	1000
Dibutyl phthalate (DBP)	1000
Diisobutyl phthalate (DIBP)	1000

Exemptions: No exemptions are claimed.

Arduino Boards are fully compliant with the related requirements of European Union Regulation (EC) 1907 /2006 concerning the Registration, Evaluation, Authorization and Restriction of Chemicals (REACH). We declare none of the SVHCs (https://echa.europa.eu/web/guest/candidate-list-table), the Candidate List of Substances of Very High Concern for authorization currently released by ECHA, is present in all products (and also packaged) in quantities totaling in a concentration equal or above 0.1%. To the best of our knowledge, we also declare that our products do not contain any of the substances listed on the "Authorisation List" (Annex XIV of the REACH regulations) and Substances of Very High Concern (SVHC) in any significant amounts as specified by the Annex XVII of Candidate list published by ECHA (European Chemical Agency) 1907 /2006/EC.

6.3 Conflict Minerals Declaration

As a global supplier of electronic and electrical components, Arduino is aware of our obligations with regards to laws and regulations regarding Conflict Minerals, specifically the Dodd-Frank Wall Street Reform and Consumer Protection Act, Section 1502. Arduino does not directly source or process conflict minerals such as Tin, Tantalum, Tungsten, or Gold. Conflict minerals are contained in our products in the form of solder, or as a component in metal alloys. As part of our reasonable due diligence Arduino has contacted component suppliers within our supply chain to verify their continued compliance with the regulations. Based on the information received thus far we declare that our products contain Conflict Minerals sourced from conflict-free areas.

7 FCC Caution

Any Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:

(1) This device may not cause harmful interference

(2) this device must accept any interference received, including interference that may cause undesired operation.

FCC RF Radiation Exposure Statement:

1. This Transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.
2. This equipment complies with RF radiation exposure limits set forth for an uncontrolled environment.
3. This equipment should be installed and operated with minimum distance 20cm between the radiator & your body.

English: User manuals for license-exempt radio apparatus shall contain the following or equivalent notice in a conspicuous location in the user manual or alternatively on the device or both. This device complies with Industry Canada licence-exempt RSS standard(s). Operation is subject to the following two conditions:

(1) this device may not cause interference

(2) this device must accept any interference, including interference that may cause undesired operation of the device.

French: Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes :

(1) l'appareil nedoit pas produire de brouillage

(2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

IC SAR Warning:

English This equipment should be installed and operated with minimum distance 20 cm between the radiator and your body.

French: Lors de l' installation et de l' exploitation de ce dispositif, la distance entre le radiateur et le corps est d 'au moins 20 cm.

Important: The operating temperature of the EUT can't exceed 85°C and shouldn't be lower than -40°C.

Hereby, Arduino S.r.l. declares that this product is in compliance with essential requirements and other relevant provisions of Directive 2014/53/EU. This product is allowed to be used in all EU member states.

8 Company Information

Company name	Arduino S.r.l
Company Address	Via Andrea Appiani 25 20900 MONZA Italy

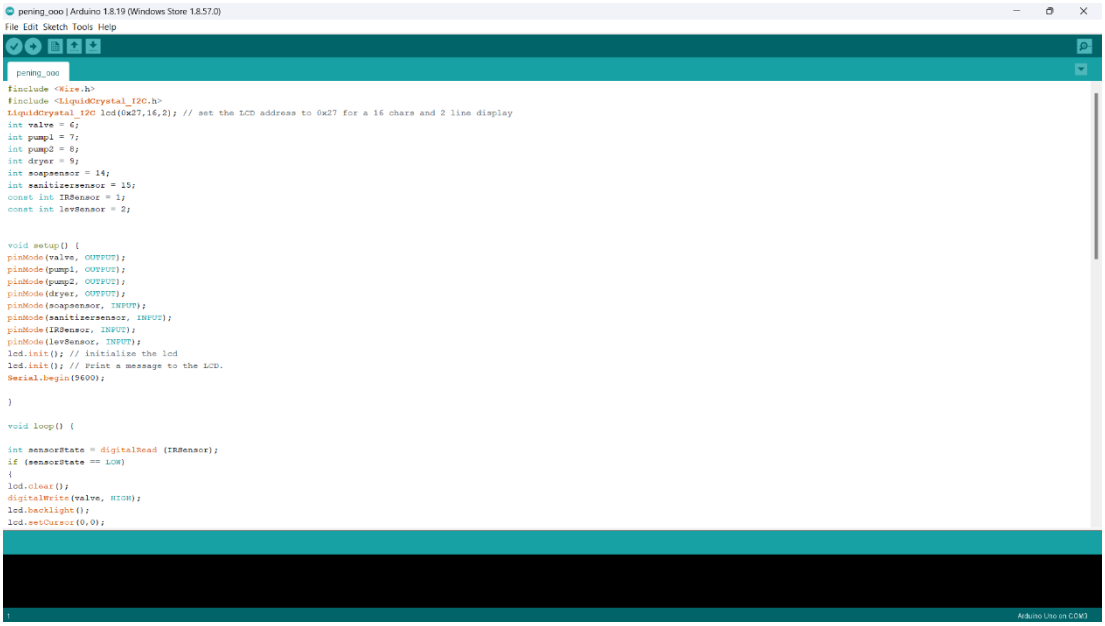
9 Reference Documentation

Reference	Link
Arduino IDE (Desktop)	https://www.arduino.cc/en/Main/Software
Arduino IDE (Cloud)	https://create.arduino.cc/editor
Cloud IDE Getting Started	https://create.arduino.cc/projecthub/Arduino_Genuino/getting-started-with-arduino-web-editor-4b3e4a
Arduino Pro Website	https://www.arduino.cc/pro
Project Hub	https://create.arduino.cc/projecthub?by=part&part_id=11332&sort=trending
Library Reference	https://www.arduino.cc/reference/en/
Online Store	https://store.arduino.cc/

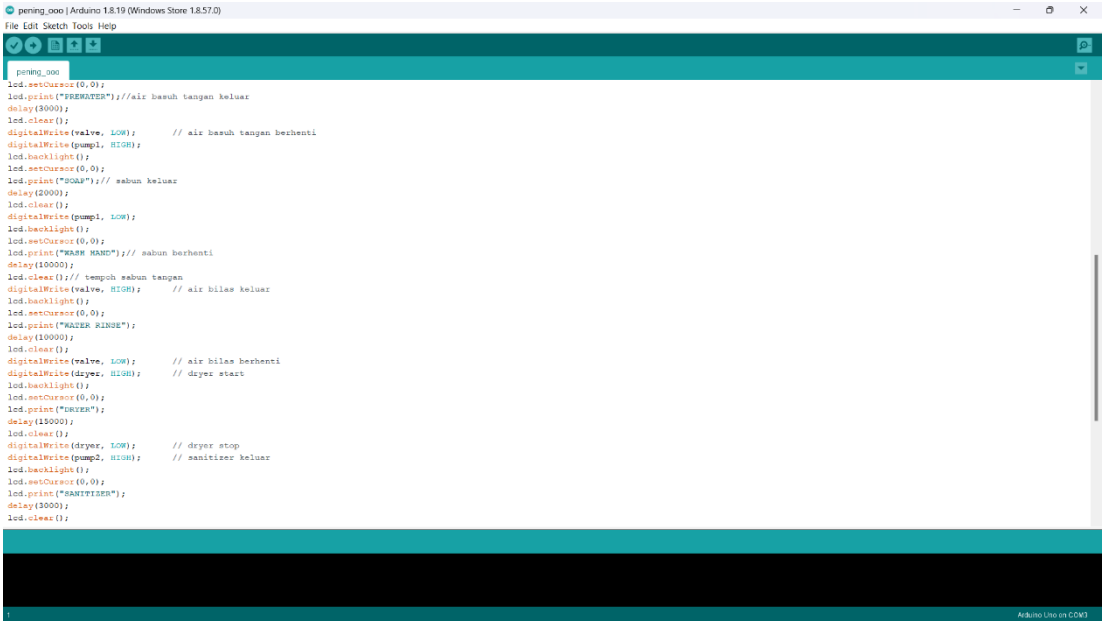
10 Revision History

Date	Revision	Changes
xx/06/2021	1	Datasheet release

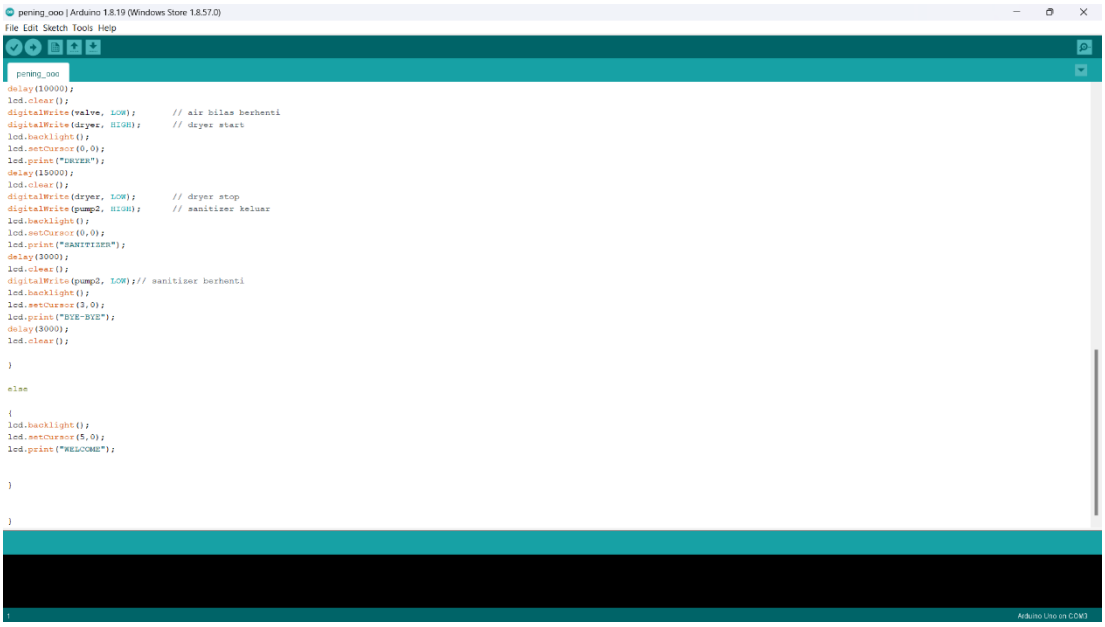
APPENDIX B- PROGRAMMING



```
pening_ooo | Arduino 1.8.19 (Windows Store 1.8.57.0)
File Edit Sketch Tools Help
pening_ooo
#include <Wire.h>
#include <LiquidCrystal_I2C.h>
LiquidCrystal_I2C lcd(0x27,16,2); // set the LCD address to 0x27 for a 16 chars and 2 line display
int valve = 6;
int pump1 = 7;
int pump2 = 8;
int dryer = 9;
int soapsensor = 14;
int sanitizersensor = 15;
const int IRSensor = 1;
const int levSensor = 2;


void setup() {
pinMode(valve, OUTPUT);
pinMode(pump1, OUTPUT);
pinMode(pump2, OUTPUT);
pinMode(dryer, OUTPUT);
pinMode(soapsensor, INPUT);
pinMode(sanitizersensor, INPUT);
pinMode(IRSensor, INPUT);
pinMode(levSensor, INPUT);
lcd.init(); // initialize the lcd
lcd.init(); // Print a message to the LCD.
Serial.begin(9600);

}

void loop() {

int sensorState = digitalRead (IRSensor);
if (sensorState == LOW)
{
lcd.clear();
digitalWrite(valve, HIGH);
lcd.backlight();
lcd.setCursor(0,0);
```



```
pening_ooo | Arduino 1.8.19 (Windows Store 1.8.57.0)
File Edit Sketch Tools Help
pening_ooo
lcd.setCursor(0,0);
lcd.print("PREWATER");//air basuh tangan keluar
delay(3000);
lcd.clear();
digitalWrite(valve, LOW);       // air basuh tangan berhenti
digitalWrite(pump1, HIGH);
lcd.backlight();
lcd.setCursor(0,0);
lcd.print("SOAP");// sabun keluar
delay(2000);
lcd.clear();
digitalWrite(pump1, LOW);
lcd.backlight();
lcd.setCursor(0,0);
lcd.print("WASH HAND");// sabun berhenti
delay(10000);
lcd.clear();// tempoh sabun tangan
digitalWrite(valve, HIGH);      // air bilas keluar
lcd.backlight();
lcd.setCursor(0,0);
lcd.print("WATER RINSE");
delay(10000);
lcd.clear();
digitalWrite(valve, LOW);       // air bilas berhenti
digitalWrite(dryer, HIGH);      // dryer start
lcd.backlight();
lcd.setCursor(0,0);
lcd.print("DRYER");
delay(15000);
lcd.clear();
digitalWrite(dryer, LOW);       // dryer stop
digitalWrite(pump2, HIGH);      // sanitizer keluar
lcd.backlight();
lcd.setCursor(0,0);
lcd.print("SANITIZER");
delay(3000);
lcd.clear();
```


pening_ooo | Arduino 1.8.19 (Windows Store 1.8.57.0)
File Edit Sketch Tools Help
pening_ooo
delay(10000);
lcd.clear();
digitalWrite(valve, LOW); // air bilas berhenti
digitalWrite(dryer, HIGH); // dryer start
lcd.backlight();
lcd.setCursor(0,0);
lcd.print("DRYER");
delay(15000);
lcd.clear();
digitalWrite(dryer, LOW); // dryer stop
digitalWrite(pump2, HIGH); // sanitizer keluar
lcd.backlight();
lcd.setCursor(0,0);
lcd.print("SANITIZER");
delay(3000);
lcd.clear();
digitalWrite(pump2, LOW);// sanitizer berhenti
lcd.backlight();
lcd.setCursor(3,0);
lcd.print("BYE-BYE");
delay(3000);
lcd.clear();
}
else
{
lcd.backlight();
lcd.setCursor(5,0);
lcd.print("WELCOME");
}
}
Arduino Uno on COM3

APPENDIX C- PROJECT MANUAL/PRODUCT CATALOGUE


How To WASH HANDS
PROPERLY AND CORRECTLY
#60SECONDSFORSTAYHYGIENE
1.
Rub thumb in circular motion
2.
Rub your back and between your fingers
3.
The fingers on the inside of both hands interlocking
4.
Rub your palms and between your fingers
5.
Rub wrist in circular motion
SMART AUTOMATIC HANDWASH


Follow This Step !!!
Using Water,Soap, Dryer and Sanitizer
#60SECONDSFORSTAYHYGIENE
#1
Wet your hands for 3 seconds.
#2
Put soap on the palm of one hand for 2 seconds.
#3
20 SEC
Wash your hands for 20 seconds.
#4
Rinse well for 12 seconds.
#5
Dry your hands with a hand dryer for 22 seconds.
#6
HAND SANITIZER
Sanitize your hand just for 1 seconds
SMART AUTOMATIC HANDWASH