BANGLADESH UNIVERSITY OF ENGINEERING AND TECHNOLOGY
DEPARTMENT OF ELECTRICAL AND ELECTRONIC ENGINEERING

EEE 416 (January 2022) **A2**
Microprocessor and Embedded Systems Laboratory

Final Project Report

Vending Machine for Hygiene Product

Evaluation Form:

STEP	DESCRIPTION	MAX	SCORE
1	Report (Format, Reference)	10	
2	Design Method and Complete Design (Hardware Implementation)	15	
3	Video Demonstration	10	
4	Novelty of Design	15	
5	Project Management and Cost Analysis	10	
6	Considerations to Public Health and Safety, Environment and Cultural and Societal Needs	10	
7	Assessment of Societal, Health, Safety, Legal, and Cultural issues relevant to the solution	10	
8	Evaluation of the sustainability and impact of designed solution in societal and environmental contexts	10	
9	Individual Contribution (Viva)	20	
10	Teamwork and Diversity	10	
	TOTAL	120	

Signature of Evaluator: _____

Academic Honesty Statement:

IMPORTANT! Please carefully read and sign the Academic Honesty Statement, below. Type the student ID and Write your name in your own handwriting. *You will not receive credit for this project experiment unless this statement is signed in the presence of your lab instructor.*

"In signing this statement, We hereby certify that the work on this project is our own and that we have not copied the work of any other students (past or present), and cited all relevant sources while completing this project. We understand that if we fail to honor this agreement, We will each receive a score of ZERO for this project and be subject to failure of this course."

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1 Abstract

In this EEE416 sessional course we have built a vending machine that provides sanitary pads for female students in an educational institution. We have two sections in this vending machine so that additional hygiene product or medicine products can be provided as per demand. First female students register for this machine with their fingerprints. Their fingerprints are stored in the memory of the fingerprint sensor. When a student goes to purchase a product, she will first have to recognize herself with her fingerprint. Then she'll select a button among two push buttons. So, a product will be released from the machine, and she'll collect the product. We have designed a website for billing. On the website the billing information is saved and later she'll pay the bill through her institutional payment system.

2 Introduction

Period is a general physical condition in a female body that repeats once in every 28 days. In this condition it becomes difficult for them to attend classes regularly. To solve this problem there are sanitary pads that helps them from unwanted leakage. But one problem is there, which often it's tough to detect exactly when leakage happens and in worst case if it happens during class time a student feels discomfort and disturbed. To solve this problem, we have built a vending machine to provide sanitary pads to our female students that will be placed at the campus, and they can get the product whenever required.

- The vending machine has two parts: hardware and software.
  - **Hardware** part is the machine itself.
  - This machine has a fingerprint sensor that detects its customers. In the LCD display name and id of the student is shown.
  - Two conveyer belts are placed inside the machine. Products are placed on the conveyer belts.
  - There are two push buttons to select to select any product from any of the belt. When the customer pushes a button the corresponding belt rolls and the desired product falls into the front basket and the customer collects her product.
  - **Software section:** The machine is programmed with Arduino and data from the machine is sent to a server by a NodeMCU. Codes are written in Arduino IDE.
  - There is a website for billing. After every purchase billing information is saved in the website with the customer information.

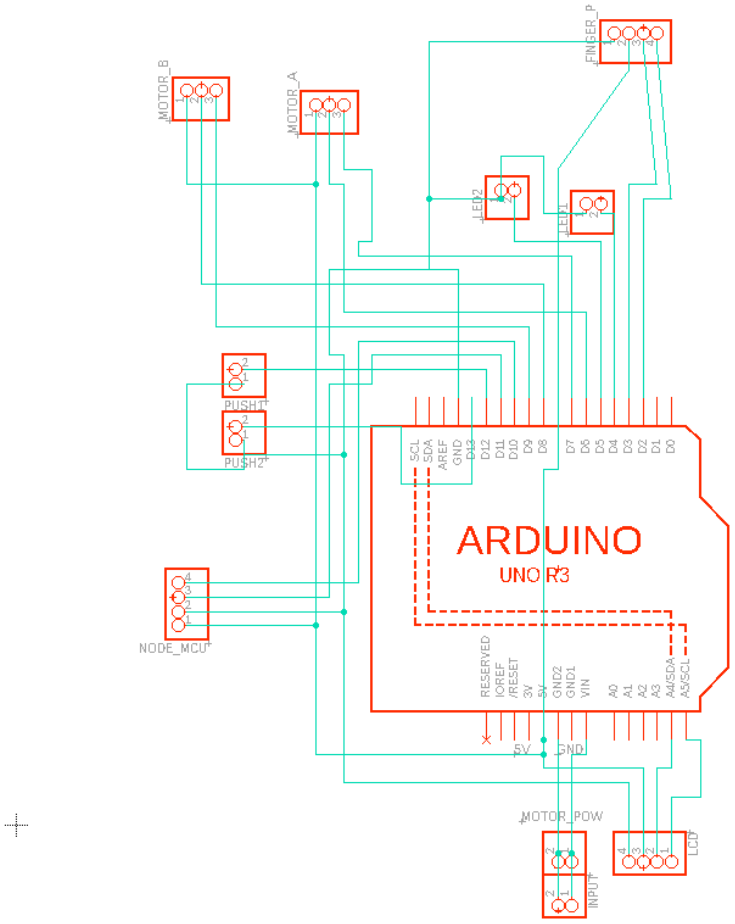
3 Design

3.1 Design Method:

Components:

- **Arduino UNO**
- **Esp8266 NodeMCU**
- **Fingerprint sensor R305**
- **Motor (2 pcs)**
- **Motor driver shield**
- **Push button (2 pcs)**
- **LED (2pcs)**
- **LCD Display**
- **Bread board**
- **Jumpers**
- **PCB**
- **Battery**
- **Conveyer Belt**
- **Wooden Box**

3.2 Circuit Diagram



3.3 Full Source Code of Firmware

Vending machine Arduino code	Esp code

#include<Adafruit_Fingerprint.h>
 	
#include <SoftwareSerial.h>
#include <ArduinoJson.h>
 	
//Initialise Arduino to NodeMCU (5=Rx & 6=Tx)
 	
SoftwareSerial
	//ThatsEngineering
	
	//Sending Data from Arduino to NodeMCU Via Serial Communication
	//NodeMCU code
	
	//Include Lib for Arduino to Nodemcu
	#include <SoftwareSerial.h>
	#include <ArduinoJson.h>
	#include <ESP8266WiFi.h>
	#include <WiFiClient.h>
	#include <ESP8266WebServer.h>
	#include <ESP8266HTTPClient.h>

```
mySerial(2, 3);

#include
<Wire.h>
#include
<LiquidCrystal_I2
C.h>

LiquidCrystal_I2C
lcd(0x27, 16, 2);
// set the LCD
address to 0x27
for a 16 chars
and 2 line
display



//Initialise
Arduino to
NodeMCU (5=Rx &
6=Tx)
SoftwareSerial
nodemcu(10, 11);

//Initialisation
of DHT11 Sensor

int id;
String product;
int value;



//const int
ledPin = 13;// We
will use the
internal LED
const int
buttonPin = 12;//
the pin our push
button is on
const int
buttonPin1 =
13;// the pin our
push button is on
```

```
WiFiClient client;

int Led_OnBoard = 2;
// Initialize the Led_OnBoard


const char* ssid = "Trojan VIRUS";
// Your wifi Name
const char* password = "password";
// Your wifi Password

const char *host = "192.168.1.8";
//Your pc or server (database) IP,
example : 192.168.0.0 , if you are
a windows os user, open cmd, then
type ipconfig then look at IPv4
Address.


//D6 = Rx & D5 = Tx
SoftwareSerial nodemcu(D6, D5);


void setup() {
  pinMode(Led_OnBoard, OUTPUT);
// Initialize the Led_OnBoard pin
as an output
  WiFi.mode(WIFI_OFF);
//Prevents reconnection issue
(taking too long to connect)
  delay(1000);
  WiFi.mode(WIFI_STA);
//This line hides the viewing of
ESP as wifi hotspot
  WiFi.begin(ssid, password);
//Connect to your WiFi router
  Serial.println("");

  Serial.print("Connecting");
  // Wait for connection
  while (WiFi.status() !=
WL_CONNECTED) {
    digitalWrite(Led_OnBoard,
LOW);
    delay(250);
    Serial.print(".");
    digitalWrite(Led_OnBoard,
```

```
int digitalVal;
int digitalVal1;

int motorA_IN1 =
6;// motor a
int motorA_IN2 =
7;//motor a



int motorB_IN3 =
8;// motor b
int motorB_IN4 =
9; //motor b
int rot1 = 15;
int rot2 = 10;



Adafruit_Fingerpr
int finger =
Adafruit_Fingerpr
int(&mySerial);

void setup()
{

Serial.println("P
rogram started");


Serial.begin(9600
);

nodemcu.begin(960
0);
  delay(1000);


Serial.println("n
ode mcu");


  pinMode(4,
OUTPUT);
  pinMode(5,
OUTPUT);
  digitalWrite(5,
HIGH);
```

```
HIGH);
    delay(250);
  }

  digitalWrite(Led_OnBoard, HIGH);
  //If connection successful show
IP address in serial monitor
  Serial.println("");
  Serial.println("Connected to
Network/SSID");
  Serial.print("IP address: ");
  Serial.println(WiFi.localIP());
//IP address assigned to your ESP

  // Initialize Serial port
  Serial.begin(9600);
  nodemcu.begin(9600);
  while (!Serial) continue;
}

void loop() {

  HTTPClient http;    //Declare
object of class HTTPClient

  String
IDSend,ProductSend,ValueSend,
postData;

  StaticJsonBuffer<1000>
jsonBuffer;
  JsonObject& data =
jsonBuffer.parseObject(nodemcu);

  if (data ==
JsonObject::invalid()) {
    //Serial.println("Invalid Json
Object");
    jsonBuffer.clear();
    return;
  }

  Serial.println("JSON Object
Recieved");
  int id = data["ID"];
  Serial.println(id);
  String product =
```

```
  digitalWrite(4, LOW);


pinMode(motorA_IN1, OUTPUT);

pinMode(motorA_IN2, OUTPUT);

pinMode(motorB_IN3, OUTPUT);

pinMode(motorB_IN4, OUTPUT);


pinMode(buttonPin, INPUT_PULLUP);
// Set the Tilt Switch as an input

pinMode(buttonPin1, INPUT_PULLUP);
// Set the Tilt Switch as an input

  lcd.init();
// initialize the lcd

lcd.backlight();
  lcd.clear();

lcd.setCursor(0, 0);

lcd.print("Vending Machine");


Serial.println("lcd on");
```

```
data["Product"];
  Serial.println(product);
  float value = data["Value"];
  Serial.println(value);

  Serial.println("----------
-------------------------");

  IDSend = String(id);   //String
to interger conversion
  ProductSend = String(product);
//String to interger conversion
  ValueSend = String(value);
//String to interger conversion
  postData = "ID=" + IDSend +
"&Product=" + ProductSend +
"&Value=" + ValueSend;

  http.begin(client,
"http://192.168.1.8/Nodemcu_db_rec
ord_view/InsertDB.php");
  //
http.begin("http://192.168.137.1/N
odemcu_db_record_view/InsertDB.php
");              //Specify request
destination
  http.addHeader("Content-Type",
"application/x-www-form-
urlencoded");    //Specify
content-type header

  int httpCode =
http.POST(postData);   //Send the
request
  String payload =
http.getString();    //Get the
response payload

  //Serial.println("LDR Value=" +
ldrvalue);
  Serial.println(httpCode);
//Print HTTP return code
  Serial.println(payload);
//Print request response payload
  Serial.println("ID Value=" +
IDSend);
  Serial.println("Product Value="
```

```
  while (!Serial);  // For Yun/Leo/Micro/Zero/...
  delay(100);

Serial.println("\n\nAdafruit finger detect test");

  // set the data rate for the sensor serial port

finger.begin(57600);

  if (finger.verifyPassword()) {

Serial.println("Found fingerprintln sensor!");
  } else {

Serial.println("Did not find fingerprintln sensor :(");
    while (1) {
      delay(1);
    }
  }


finger.getTemplateCount();

Serial.println("Sensor contains ");
Serial.println(fi
```

```
+ ProductSend);
  Serial.println("Value Value=" + ValueSend);

  http.end();  //Close connection

  delay(4000);  //Here there is 4 seconds delay plus 1 second delay below, so Post Data at every 5 seconds
  digitalWrite(Led_OnBoard, LOW);
  delay(1000);
  digitalWrite(Led_OnBoard, HIGH);


}
```

```
nger.templateCoun
t);
Serial.println("
templates");

Serial.println("W
aiting for valid
finger...");




Serial.println("P
rogram started");

}

void loop()
// run over and
over again
{

Serial.println("l
oop on");
  int x;

StaticJsonBuffer<
1000> jsonBuffer;
  JsonObject&
data =
jsonBuffer.create
Object();



Serial.println("P
lease scan the
fingerprintln to
verify
yourself");
  x =
getFingerprintIDe
z();


Serial.println(x)
;
```

```
  delay(50);
//don't ned to
run this at full
speed.


digitalWrite(11,
HIGH);

digitalWrite(butt
onPin, HIGH);
  digitalVal =
digitalRead(butto
nPin); // Take a
reading


digitalWrite(12,
HIGH);

digitalWrite(butt
onPin1, HIGH);
  digitalVal1 =
digitalRead(butto
nPin1); // Take a
reading

  if (x == 8)
  {
    id = 63;
    lcd.clear();

lcd.println("Welc
ome 1706063");
  }
  if (x == 9)
  {
    id = 49;
    lcd.clear();

lcd.println("Welc
ome 1706049");
  }
  if (x == 7)
  {
    id = 49;
    lcd.clear();
```

```
lcd.println("Welc
ome 1706049");
  }




  while (x > 0)
  {

    digitalVal =
digitalRead(butto
nPin);
    digitalVal1 =
digitalRead(butto
nPin1);
    if
(digitalVal ==
LOW)
    {

//digitalWrite(le
dPin, HIGH);
//Turn the LED on

Serial.println(di
gitalVal);

//digitalWrite(le
dPin, HIGH);
//Turn the LED on


lcd.clear();

lcd.println("Prod
uct A is
selected");

Serial.println("P
roduct A is
selected  ");
      product =
"A";
      value =
```

```
100;
      delay(100);


delay(5000);
      int k = 0;
      while (k <
rot1) {

//analogWrite(mot
orA_PWM, spd);

digitalWrite(moto
rA_IN1, LOW);

digitalWrite(moto
rA_IN2, HIGH);


delay(50);

digitalWrite(moto
rA_IN1, LOW);

digitalWrite(moto
rA_IN2, LOW);

delay(50);
        k = k +
1;
      }

Serial.println("
Motor turned
on");


lcd.clear();

lcd.println("Prod
uct deliverd");

lcd.clear();
      delay(50);

lcd.println("Vend
ing Machine");
```

```
delay(1000);

Serial.println("
Verified. Product
will be down in a
short time");
      break;
    }

    if
(digitalVal1 ==
LOW)
    {

//digitalWrite(le
dPin, HIGH);
//Turn the LED on

Serial.println(di
gitalVal1);

//digitalWrite(le
dPin, HIGH);
//Turn the LED on

lcd.clear();

lcd.println("Prod
uct B is
selected");

Serial.println("P
roduct B is
selected  ");
      delay(100);

Serial.println("P
roduct B is
selected  ");

      product =
"B";
      value =
150;
```

```
delay(5000);
      int k = 0;
      while (k <
rot2) {

//analogWrite(mot
orA_PWM, spd);

digitalWrite(moto
rB_IN3, LOW);

digitalWrite(moto
rB_IN4, HIGH);


delay(50);

digitalWrite(moto
rB_IN3, LOW);

digitalWrite(moto
rB_IN4, LOW);

delay(50);
        k = k +
1;
      }

lcd.clear();

lcd.println("Prod
uct deliverd");

lcd.clear();
      delay(50);

lcd.println("Vend
ing Machine");

Serial.println("
Verified. Product
will be down in a
short time");

      break;
    }
```

```
  }
  if (x > 0) {

    //Obtain Temp
and Hum data
    //Assign
collected data to
JSON Object
    data["ID"] =
id;

data["Product"] =
product;
    data["Value"]
= value;


Serial.println(id
);

Serial.println(va
lue);

Serial.println(pr
oduct);


    //Send data
to NodeMCU

data.printTo(node
mcu);

jsonBuffer.clear(
);

    delay(2000);

finger.begin(5760
0);



  }
```

```
}
uint8_t
getFingerprintID(
) {


  uint8_t p =
finger.getImage()
;
  switch (p) {
    case
FINGERPRINT_OK:

Serial.println("I
mage taken");
      break;
    case
FINGERPRINT_NOFIN
GER:

Serial.println("N
o finger
detected");
      return p;
    case
FINGERPRINT_PACKE
TRECIEVEERR:

Serial.println("C
ommunication
error");
      return p;
    case
FINGERPRINT_IMAGE
FAIL:

Serial.println("I
maging error");
      return p;
    default:

Serial.println("U
nknown error");
      return p;
  }

  // OK success!
```

```
  p =
finger.image2Tz()
;
  switch (p) {
    case
FINGERPRINT_OK:

Serial.println("I
mage converted");
      break;
    case
FINGERPRINT_IMAGE
MESS:

Serial.println("I
mage too messy");
      return p;
    case
FINGERPRINT_PACKE
TRECIEVEERR:

Serial.println("C
ommunication
error");
      return p;
    case
FINGERPRINT_FEATU
REFAIL:

Serial.println("C
ould not find
fingerprint
features");
      return p;
    case
FINGERPRINT_INVAL
IDIMAGE:

Serial.println("C
ould not find
fingerprint
features");
      return p;
    default:

Serial.println("U
```

```
nknown error");
      return p;
  }

  // OK
converted!
  p =
finger.fingerFast
Search();
  if (p ==
FINGERPRINT_OK) {

Serial.println("F
ound a print
match!");
  } else if (p ==
FINGERPRINT_PACKE
TRECIEVEERR) {

Serial.println("C
ommunication
error");
    return p;
  } else if (p ==
FINGERPRINT_NOTFO
UND) {

Serial.println("D
id not find a
match");
    return p;
  } else {

Serial.println("U
nknown error");
    return p;
  }

  // found a
match!

Serial.print("Fou
nd ID #");
Serial.print(fing
er.fingerID);
  Serial.print("
with confidence
```

```
of ");
Serial.println(fi
nger.confidence);

  return
finger.fingerID;
}

// returns -1 if
failed, otherwise
returns ID #
int
getFingerprintIDe
z() {
  uint8_t p =
finger.getImage()
;
  if (p !=
FINGERPRINT_OK)
return -1;

  p =
finger.image2Tz()
;
  if (p !=
FINGERPRINT_OK)
return -1;

  p =
finger.fingerFast
Search();
  if (p !=
FINGERPRINT_OK)
return -1;

  // found a
match!
  digitalWrite(5,
LOW);
  digitalWrite(4,
HIGH);
  delay(1000);
  digitalWrite(4,
LOW);
  digitalWrite(5,
HIGH);
```

```
                Serial.print("Fou
                nd ID #");
                Serial.print(fing
                er.fingerID);
                  Serial.print("
                with confidence
                of ");
                Serial.println(fi
                nger.confidence);
                  return
                finger.fingerID;
                }
```

Table: Source Code for the main program

Code for creating a webpage for our vending machine:

```
<!DOCTYPE html>
<html>
	<head>
		<title>Vending Machine</title>

		<meta charset="utf-8" http-equiv="refresh" content="10">
		<!-- Script for updating pages without refreshing the page -->

		<?php
		//Creates new record as per request
		//Connect to database
		$hostname = "localhost";		//example = localhost
		$username = "root";			//example = root
		$password = "";
		$dbname = "test";
		// Create connection
		$conn = mysqli_connect($hostname, $username, $password, $dbname);
		// Check connection
		if (!$conn) {
			die("Connection failed !!!");
		}
		?>

		<style>
			table {
				border-collapse: collapse;
				width: 100%;
				color: #1f5380;
				font-family: monospace;
				font-size: 20px;
				text-align: left;
			}
			th {
				background-color: #1f5380;
				color: white;
			}
			tr:nth-child(even) {background-color: #f2f2f2}
		</style>
	</head>
	<body>
		<h1 align="center" style="color:#1f5380;">Tamim's Vending Machine
```

```
Dashboard</h1>
		<table>
			<tr>
				<th>No</th>
				<th>Product</th>
				<th>Value</th>
				<th>Time Stamp</th>
			</tr>
			<?php
				$table = mysqli_query($conn, "SELECT StdID, Product,value,
time FROM vending"); //nodemcu_ldr_table = Youre_table_name
				while($row = mysqli_fetch_array($table))
				{
			?>
			<tr>
				<td><?php echo $row["StdID"]; ?></td>
				<td><?php echo $row["Product"]; ?></td>
				<td><?php echo $row["value"]; ?></td>
				<td><?php echo $row["time"]; ?></td>
			</tr>
			<?php
				}
			?>
		</table>

				<h1 align="center" style="color:#1f5380;">Tamim's Vending
Machine Dashboard</h1>
		<table>
			<tr>
				<th>Student ID</th>
				<th>Product</th>
				<th>Value</th>
			</tr>
			<?php
				$table = mysqli_query($conn, "SELECT StdID, Product,value
FROM vending"); //nodemcu_ldr_table = Youre_table_name
				while($row = mysqli_fetch_array($table))
				{
			?>
			<tr>
				<td><?php echo $row["StdID"]; ?></td>
				<td><?php echo $row["Product"]; ?></td>
				<td><?php echo $row["value"]; ?> tk</td>
			</tr>
			<?php
				}
			?>
		</table>

	</body>
</html>
```

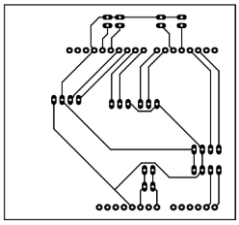
```
<?php
//Creates new record as per request
    //Connect to database
    // $servername = "Your_hostname";              //example = localhost or 192.168.0.0
    // $username = "Your_user_name";        //example = root
    // $password = "Your_user_Password";
    // $dbname = "Your_DB_name";

    $servername = "localhost";              //example = localhost or 192.168.0.0
       $username = "root";          //example = root
       $password = "";
       $dbname = "test";
```

```
    // Create connection
    $conn = new mysqli($servername, $username, $password, $dbname);
    // Check connection
    if ($conn->connect_error) {
        die("Database Connection failed: " . $conn->connect_error);
    }

    //Get current date and time
    // date_default_timezone_set('Asia/Jakarta');
    // $d = date("Y-m-d");
    // $t = date("H:i:s");

    if(($_SERVER["REQUEST_METHOD"] == "POST"))
    {
        $ID = test_input($_POST['ID']);
        $Product = test_input($_POST["Product"]);
        $Value = test_input($_POST["Value"]);

           // $sql = "INSERT INTO nodemcu_ldr_table (Ldr, Date, Time) VALUES
('".$ldrvalue."', '".$d."', '".$t."')"; //nodemcu_ldr_table = Youre_table_name
        $sql = "INSERT INTO vending (StdID, value,Product) VALUES ('".$ID."','".$Value."',
'".$Product."')"; //nodemcu_ldr_table = Youre_table_name

               if ($conn->query($sql) === TRUE) {
                   echo "OK";
               } else {
                   echo "Error: " . $sql . "<br>" . $conn->error;
               }
       }
    function test_input($data) {
        $data = trim($data);
        $data = stripslashes($data);
        $data = htmlspecialchars($data);
        return $data;
    }

       $conn->close();
?>
```

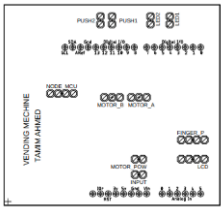
4 Implementation

4.1 Description

We built our pcb board using the eagle software. We didn't place any component on the board, rather we placed the pins of our components. Then drew the connections in those pins. After auto routing our pcb layout was formed. Later we had our pcb board done from a pcb making shop.



Bottom



Top

Figure: PCB layout

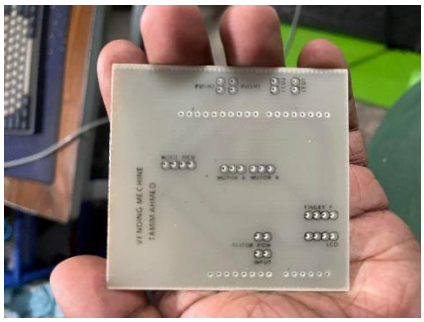


Figure: Implementation of Design

4.2 Results

In our project no calculation was required. We operated our vending machine successfully. At the beginning we encountered some troubles, later we overcame those and made the project successful.

4.3 GitHub Link

https://github.com/tamimahmed063/Vending-Machine-for-hygiene-product?fbclid=IwAR0XPq027PZ6qoL-8paBf_LqJrOV5hvtQpkgz6A6hi0eWFDYyjobXgx4oBw

4.4 YouTube Link

https://www.youtube.com/watch?v=etOdFjPLh-w&ab_channel=TamimAhmed

5 Design Analysis and Evaluation

5.1 Novelty

The utilization of vending machine for providing only hygiene product is not so common.

In our vending machine we used a conveyer belt instead of rolling spring which is used in as usual vending machines.

5.2 Project Management and Cost Analysis

5.2.1 Bill of Materials

Product	Quantity	Cost(Taka)
Arduino UNO	1	1200
Esp8266 NodeMCU	1	800
Fingerprint sensor R305	1	1700
Motor driver	1	400
DC motor	2	50
Lipo battery	1	2200
LCD display	1	800
PCB board	6	600
Breadboards	3	100
Wires and jumpers	4 bundles	300

Wood board	1(Large)	400
Spray can	1	150
Push button	2	200
LED	2	100
Total cost of Vending machine	1	9000

5.2.2 Calculation of Per Unit Cost of Prototype

The total cost spent to build this vending machine stood at 9000 takas.

5.2.3 Calculation of Per Unit Cost of Mass-Produced Unit

Obviously, mass production leads to a reduction in manufacturing cost. We have little idea on industrial level expenditure. Also, in case of mass production some modifications of the project are required. So, we couldn't exactly calculate the cost of mass production.

5.2.4 Timeline of Project Implementation

After the confirmation this project, we immediately started working on it. Total duration of the project can be summed up to 10 weeks.

5.3 Practical Considerations of the Design to Address Public Health and Safety, Environment, Cultural, and Societal Needs

5.3.1 Considerations to public health and safety

Our vending machine supplies sanitary pads for female students increasing female health conditions and reducing fatalities.

5.3.2 Considerations to environment

We did not follow any steps that could jeopardise the surrounding environment

5.3.3 Considerations to cultural and societal needs

It is a taboo in our society. It will prevent female to buy in outdoors and make them confident.

5.4 Assessment of the Impact of the Project on Societal, Health, Safety, Legal and Cultural Issues

5.4.1 Assessment of Societal Issues

Societal impact of our vending machine is pretty good. It would enhance the hygiene situationin our schools, colleges, universities.

5.4.2 Assessment of Health and Safety Issues

This machine is user friendly and prone to zero risk.

5.4.3 Assessment of Legal Issues

Transparency is maintained.

5.4.4 Assessment of Cultural Issues

This product has the ability to bring about change in people's mindset

5.5 Evaluation of the Sustainability the and Impact of the Designed Solution in the Societal and Environmental Contexts

5.5.1 Evaluation of Sustainability

The box is made of wood, and all the components in the box fit suitably. Lots of trial run was executed to finalize its commission.

5.5.2 Evaluation of Impact of Design in Societal Context

Transparency is maintained

5.5.3 Evaluation of Impact of Design in Environmental Context

No such product is used that can harm environment

6 Reflection on Individual and Teamwork

6.1 Individual Contribution of Each Member

1706063: Arduino+ESP Code, Hardware, Report, Presentation

1706049: PCB, Hardware, Report, Presentation

1706060: Hardware, Report, Presentation

1606110: Report, Presentation

6.2 Mode of Teamwork

We worked together to complete this project. We did everything offline. We used to work at Sher-e-Bangla Hall.

6.3 Diversity Statement of Team

We four members hold different capabilities.

Id 63 - has an expertise in coding. So, he handled the software part. He wrote all the codes to communicate the Arduino with NodeMCU and control the other components like motor, lcd, fingerprint etc.

Id 49 & 60 - Handled the hardware part. They made the box in such a design that a user can have easy access to the machine. ID 49 also design the PCB to compact the overall circuit. Id 60 brought aesthetics to the design.

Id 16110 – He helped purchasing and collecting the component and collaborated with three of us.

6.4 Logbook of Project Implementation

Date	Milestone achieved	Individual Role	Team Role	Comments
18.7.22	Almost all components were	1706063, 1706049, 1706060	Create the backbone of the	

	purchased		project	
21.7.22	Started working on the Arduino to run the motor and semses fingerprint with sensor	1706063	Help to find resources	
25.7.22	How to connect the esp to wifi	1706063	Help to find resources	
30.7.22	How to create a server using XAMP	1706063	Help to find resources	
2.8.22	Create a conveyer belt	1706063, 1706049	Help to find resources	
6.8.22	Serial communication between Arduino and NODE MCU	1706063	Help to find resources	
10.8.22	Design PCB	1706063, 1706049	Help to find resources	
25.8.22	Design a box and built it	1706049, 1706060, 16110	Help to find resources	
28.8.22	Assemble all the component to the box	1706049, 1706060, 16110	Help to find resources	
29.8.22	Create a fully running machine	1706063,1706049, 1706060, 16110	Establish good understanding	
30.8.22	Demonstration video	1706063,1706049, 1706060, 16110	Establish good understanding	
30.8.22	Draft Report writing	1706063,1706049, 1706060, 16110	Establish good understanding	
30.8.22	Presentation	1706063,1706049, 1706060, 16110	Establish good understanding	

7 References

https://randomnerdtutorials.com/esp8266-nodemcu-thingspeak-publish-arduino/#:~:text=To%20send%20values%20from%20the,need%20it%20in%20a%20moment.
https://www.youtube.com/watch?v=YXCK03O-wjM
https://www.youtube.com/watch?v=TnWDlHpY56o
https://www.youtube.com/watch?v=WNK1unCzpds