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IoT Based Smart System to Control Customer Service Area

Smart Monitoring System for Sea Diver's Health and Location Conditions

Mobile Application for Order Management at Oman Cables Company

The Smart Meters Inventory Control System for Mazoon Electricity Company

Design and Implementation of Mawhiba Mobile App

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On behalf of my co-editors (Prof. Ahmed Nawaz Hakro, Prof. Anupam Srivastav, Prof. Mounir Dhibi) and other members of Editorial Board, I am delighted to bring this 3rd Issue of the Journal of Big Data and Smart City (JBDSC).

This Issue, like its predecessor issues, is an open access journal, with an Arabic translation of the Abstract of every paper published.

The Journal of Big Data and Smart City (JBDSC) is providing an exciting platform to scholars, researchers, other related professionals, policy makers, and especially to the students, to showcase their scholarly ideas and research in Smart City applications, building on Big Data technologies. The journal has been accessible, engaging and motivating to the young researchers, as all the 05 publications in this Issue are joint work with students.

The journal has been successful to fulfil its objective to publish original interdisciplinary research. All the published papers, which cover the areas of Expert Systems, IoT, Mobile Applications, etc, have been subjected to a double-blind review process. The multidisciplinary collaborative work combining multiple fields in wider possible contexts, published in this issue integrates theoretical, experimental, and computational approaches, providing solutions towards smart city/ information and communication technologies themes.

I am thankful to those who submitted papers, both individually or collaboratively from academia and industry. I take this opportunity to also thank all those who contributed in bringing out this issue of the Journal. My special thanks to Dr. Kiran G.R, Dean, Middle East College, for his guidance and complete support to the Editorial Board. I am extremely thankful for the kind approvals granted by MoHERI and MoI for allowing this scholarly publication.

Special thanks to all the members of the Editorial Board for dedicating their valuable time and energy which made it possible for this issue to be published well in time.

Wishing the readers of the articles of this journal making a fruitful contribution in their future research pursuits.

Dr. Saleh Al Shaaibi
Editor in Chief
Journal of Big Data and Smart City

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IOT BASED SMART SYSTEM TO CONTROL CUSTOMER SERVICE AREA

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Abstract: With the developments of it, a lot of services are being offered nowadays. Looking at the spread of COVID-19, large building managements are looking for smart solutions to control the entry points using sensors. In this work, the intentions were to extend the application of it to live to monitor the people intending to enter the area and control the entry gate using the sensor information based on temperature measurements and displaying on the dashboard. In addition, the project considered sterilizing the people at the entry, counting the people and if the capacity is full, it is controlling the entry gate. Using it, all data information was sent to the manager of the service. The project was based on an Arduino microcontroller and a couple of sensors. The design and analysis have been done using software simulation tools and by building the hardware and then comparing the results of both. Test results show that the objectives are well met as expected.

يتم مع التطور الحاصل في الخدمات ومن ضمنها خدمات إنترنت الأشياء كوفيد تب رلى انتشارا ونظرا. تقديم الكثير من الخدمات في الوقت الحاضر إدارات المباني الكبيرة عن حلول ذكية للتحكم في نقاط الدخول تبحث 19 هي توسيع خطط باستخدام أجهزة الاستشعار. في هذا العمل، كانت ال لمراقبة الأشخاص الذين ينوون دخول تطبيق إنترنت الأشياء للعيش بناء على المنطقة والتحكم في بوابة الدخول باستخدام معلومات المستشعر، قياسات درجة الحرارة والعرض على لوحة القيادة. بالإضافة إلى ذلك نظر المشروع في تعقيم الأشخاص عند المدخل وعد الأشخاص وإذا كانت السعة ممتلئة يتم التحكم في بوابة الدخول باستخدام إنترنت الأشياء، تم إرسال جميع معلومات البيانات إلى مدير الخدمة. اعتمد المشروع على واثنين من أجهزة الاستشعار. تم التصميم والتحليل/أرديونو متحكم باستخدام أدوات المحاكاة البرمجية وبناء الأجهزة ثم مقارنة نتائج كليهما تظهر نتائج الاختبار أن الأهداف قد تم تحقيقها بشكل جيد كما هو متوقع

Keywords: service area, door control, microcontroller, temperature monitoring, customer count

1. Introduction

Internet of Things (IoT) is essentially the utilization of electronic gadgets that are associated with the Internet [1]. IoT framework utilizes keen gadgets that utilize sensors and programming [2]. In current Pandemic situations, there are numerous establishments that don't permit the passage of an excess of 10 individuals [3], so this project

is to build a screen outside the main office to show quantity of individuals inside present so that the newcomers may know the rush. If there are 10 individuals inside, screen displays, kindly don't enter the room is full and the red color will turn on the device and the manager will close the door by his phone or computer, yet in the event that less than 10 individuals are inside, it will show up on the screen that the room is empty you can enter, and the green color which is in the device will turn on. In this way, there are a sure number of individuals permitted to enter the shop, and if the necessary number is finished.

In addition, there is a temperature sensor in the same device so the person should measure his temperature before entering the shop, if the temperature is high, the device will alert the manager to close the door, but if the temperature is low the device will check the number of costumers if more than 10 or less. Simultaneously, when the client enters the shop, the device will sterilize him. In addition, the manager can see the temperature of the shop and customers who are inside the shop, and the number of them on the site by writing IP Addresses. In addition, there are two clicks to control the door by opening and closing it on this site by using it. This venture can be utilized in hair parlors, women's salons, Omantel, and some little shops. The objectives of the project are to create a device that alerts visitors through a screen placed on the door so that you can know if there is a vacancy to be able to enter or not, by counting their number and displaying it on the screen.

The main requirements are to sense the temperature of the shop and the visitors to reduce the possibility of infection and to know whether the visitors' temperature is high or moderate, and if the temperature is high, the device will beep to alert the manager so that he shall not be allowed to enter (by closing the door). Another requirement is to sterilize all visitors who enter the shop and finally to allow the manager to control the door (by closing or opening it) through a site on his phone to avoid congestion and to be the maximum number of visitors is 10. The rest of the paper is organized as the second section outlines the state of the art, literature review, the third section elaborates on the methodology adopted to implement the project, the fourth section discusses the

simulation and hardware implementation results while the fifth section concludes the discussion and provides recommendations.

2. Related work

Being new venture, little literature is available on this particular application [4]. However, a lot of projects have been carried out and reported in the literature on smart homes and secure homes [5], which are similar to our application and are reviewed here. The work conducted by [6] with the title Bidirectional Visitor Counter with Automatic Room Light Controller and Arduino as the master controller is to design interior lighting with a bi-directional counter and design an Arduino controller Hall, Systems such as offices, shopping centers, and sports venues Hall, or any other visitor Place. Depending on the sensor, the pending system determines which visitors come in and out. If the system is executed successfully. The number of visitors in the hall. This is an Economic cost reduction system upon application where you need to count and control your visitors. Another project carried out in [7] with the title Internet of Things (IoT): Research Challenges and Future Applications were to use the Internet of Things (IoT) as an interconnected system. The main goal is to focus on community members using it anytime and anywhere. An it can be defined as a device commonly connected to the Internet to accomplish several goals. Many devices are connected to the system, but with the passage of time, all devices will be connected to the Internet. The IoT network operates as a network of various devices, connected to phones, screens, cars, and industrial objects.

Another project done by [8] with the title effectiveness of the steam sterilization of reusable medical devices in primary and secondary care, public hospitals in Nepal and factors associated with ineffective sterilization: A nationwide cross-sectional study talks about several methods of sterilizing medical devices, including high temperature and steam, to ensure that there are no residues of objects sticking from one patient to another. Medical devices are sterilized inside a room whose temperature reaches a high level and high pressure in order for sterilization to occur better because when these standards are not reached, sterilization will not occur as required, and this will lead to failure in the sterilization of medical devices. Medical devices are designed according to a specific mechanism, which is the design of the device in order to be reused from one patient to another. Another project by [9] with the title Investigation of the Impact of Infrared Sensors on Core Body Temperature Monitoring by Comparing Measurement Sites is on the use of the IRT thermometer is easy to use and widely available and is used to find hand and ear temperature because it measures the temperature by means of infrared radiation. With the emergence of many viruses these days, such as the Coronavirus, the use of such devices has become very important to avoid transmission of the virus, and the temperature has become measured through the forehead through infrared rays. The temperature is measured by sop, and then the temperature is measured again through the eardrum scale to make sure the temperature is correct. The

review of these project reports helped us to identify the technical details to meet our project objectives.

3. Methodology

The verification and Validation Model (V-model) is a sequential style requirement is used to carry out the project. Different stages of the V-model start from beginning with the initial step, which is the prerequisite of the project with an overview of the project concept by looking at life problems that society faces set features and needs for users, the next phase is the system design of how the system can operate. The V-model methodology is consistent with the objectives of this project. Figure 1 shows the designed block diagram of the system while figure 2 shows the system flow chart of all important actions to meet the objectives.

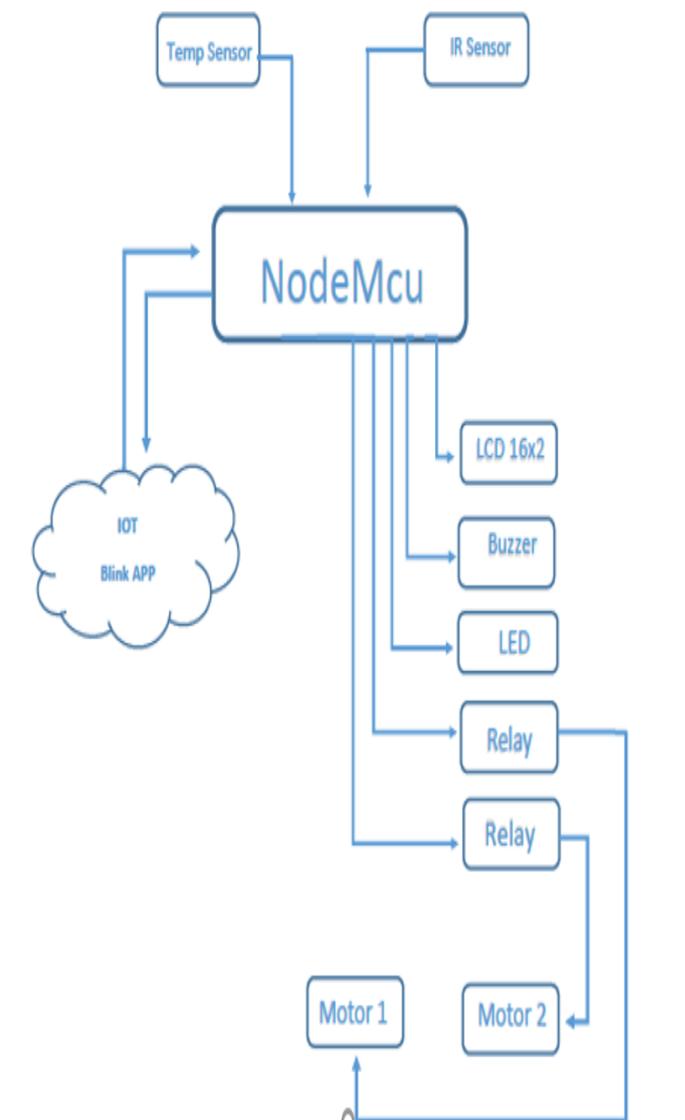


Figure 1: System Block Diagram

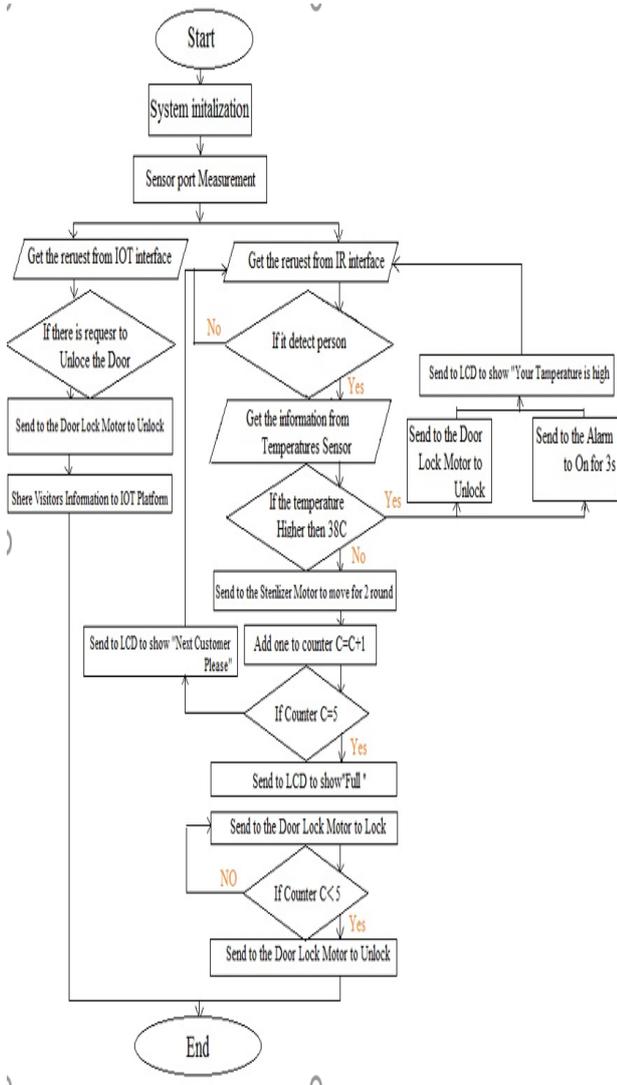


Figure 2: System Flow Chart

The system block diagram shows the components between input and output to the project controller. The input components are the temperature sensor & IR sensor as shown in designed figure 3. The Node MCU will be the controller of the project and it has the capability to interface with the IoT blink App. On the other hand, the LCD, Buzzer, LED, Relays, & Motors, will be at the output ports of the Arduino controller of the project. By defining the output and input ports and components, the controller will get the information from the sensors and give action and instruction to the LCD, Buzzer, LED, Relays, & Motors. This flowchart explains in detail the work of the circuit. The flow chart will identify the interface between the component and the required action from every component. Moreover, the flow chart will be showing the sequence of the actions, the condition of every action, and the other actions for every component. The action at the flowchart will be reflected at the controller (Node MCU) to controller the components and get the wanted results.

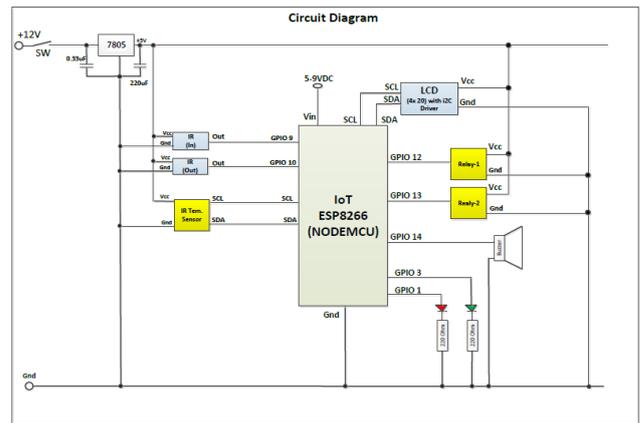


Figure 3: System Design

4. Discussion and Results

The system is implemented and simulated by utilizing Proteus 8 professional and defining all the scenarios to prove that all the project objectives are achieved. The figure shows the results in the LCD were presented the IP address, temperature room (AT), person temperature (TT), the maximum number of people that are allowed to enter the target place (MaxP), and the number of people that are already inside (In). So, the green LED is turned ON because there is a space for more people who wants to enter inside. Also, the water pump will turn ON to sterilize the person. Figures 4 and 5 demonstrate the simulation results.

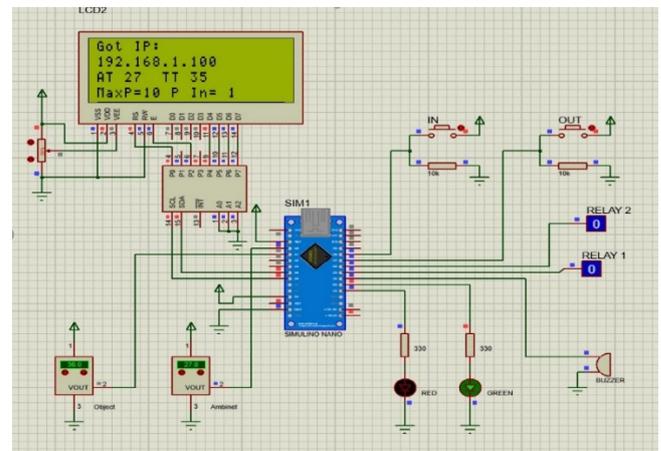


Figure 4: System Design Simulation

In the second scenario, the red LED will turn ON when there is no space for more people who wants to enter inside as shown in the following figure 5.

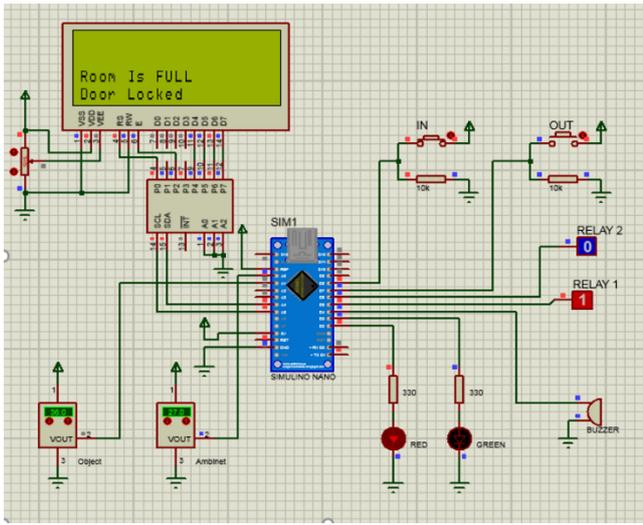


Figure 5: System Design Simulation

These scenarios of this project are elaborated in the following figures 6 and 7.

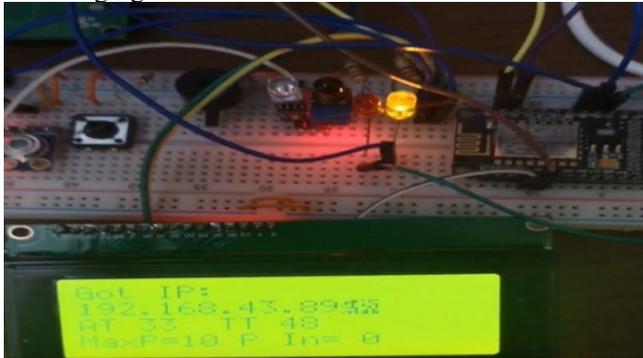


Figure 6: System Testing Hardware



Figure 7: System Testing Hardware



Figure 8: System Prototype

The first case scenario is when the door of the gate is locked based on one of these reasons which are; the human temperature is high, or there is no space for more people

inside the place. So, if one of these two conditions has occurred when the red LED will turn ON, and the door will be locked. The second case scenario is when the door is open that depends on some cases which are; the human temperature is normal, as well as, there is a space for more people to enter inside. So, the green LED will turn ON and the gate will open, also, the water pump will turn ON, as shown by a prototype in figure 8. Here, the figure shows the external form of the project. In addition, the circuit was installed in a transparent to avoid any external problems that might occur. Table 1 below shows the results of this experiment at various test points.

Table 1: Test Points

Test Point	Temperature	Number of Customers	Case of the system
T 1	32°C	Less than 10	- Green LED is turn ON - Door is open - Water pump is turn ON
T 2	33°C	More than 10	- Red LED is turn ON - Door is Close
T 3	40°C	-	- The Door is locked

The following figure shows IOT Web Server Page

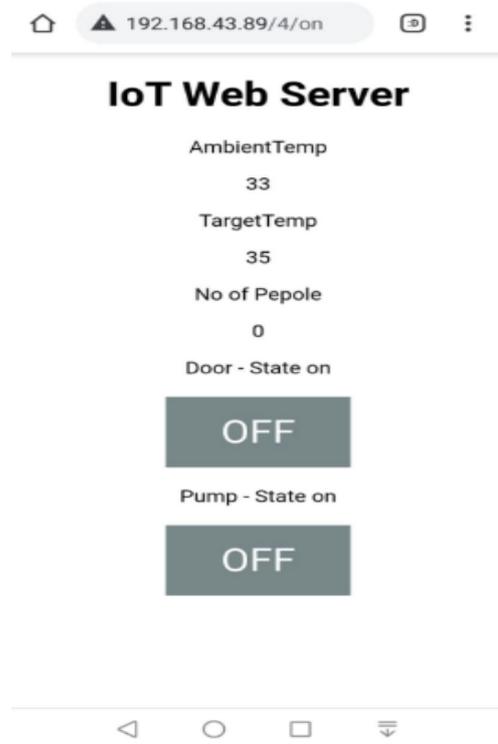


Figure 9: IoT Web Server Page

To be able to access the IoT Web Server Page, the device must be turned on first, and then this page can be accessed through the IP address which is 192.168.43.89. Appears

on this site ambient Temp=33, Target Temp=35, Number of people=0, A button to open and close the door, and a button for sterilization. So this picture shows the customer's temperature before entering the store compared to the room temperature and therefore the door can be controlled.

5. Conclusion

This project concludes with some stages of my specialization. The project also facilitates the ideas accompanying this development and facilitates some services in the community to serve the people. The project focuses on the shops and crowded places to reduce mixing in the shadow of diseases and epidemics that are widely spread in our time. The project will reduce the spread of diseases and facilitate customer service by checking the screen to see the people inside the shop. The project will contribute to many areas and will be developed. In addition, chose this project for its importance in our current society. Explanation of the parts of the project and the way the project works while adhering to the specified period for its completion. This project is considered one of the projects that should be studied and applied widely in various institutions. A few recommendations from this project are that we can reduce energy consumption by linking it to solar energy. We can support the device with a camera so that the owner of the place is sure that the person underwent a temperature test. Making the place self-sterilizing, where the room is hygienically prepared and not crowded according to the precautionary measures can further improve the project.

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SMART MONITORING SYSTEM FOR SEA DIVER'S HEALTH AND LOCATION CONDITIONS

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Abstract: The people working in marine technical fields such as ship maintenance, welding, inspection, repairs, retrieval, marine photography, and sea exploration have to dive as part of their job. Since divers work underwater, their lives are endangered due to several kinds of risks, such as increased pressure on the body, decreased body temperature, and a drop in blood oxygen level that may lead to heart and life risks. This project is designed as a smart monitoring system that measures the diver's health conditions underwater, and its location and displays the readings on an LCD installed on the connected boat and the boat sends these readings to the rescue worker in case of emergency. The project is designed using the Arduino microcontroller and sensors; following the V-model methodology to complete the design, analysis, and testing. The test results demonstrate successful implementation of the objectives as the project was able to measure the diver's heart rate and temperature with 10% accuracy with underwater pressure. The measurements were successfully displayed using a CAT 5 cable of 5m in length on LCD and an emergency call was sent to the caretaker with the location information as SMS using an available cellular network.

يجب على الأشخاص الذين يعملون في المجالات التقنية البحرية مثل صيانة السفن واللحام والتفتيش والإصلاحات والاسترجاع والتصوير البحري والاستكشاف البحري الغوص والذي هو جزء من عملهم ونظرا لأن الغواصين يعملون تحت الماء، فإن حياتهم معرضة للخطر بسبب عدة أنواع من المخاطر، مثل زيادة الضغط على الجسم، وانخفاض درجة حرارة الجسم، وانخفاض مستوى الأكسجين في الدم الذي قد يؤدي إلى مخاطر على القلب والحياة. تم تصميم هذا المشروع كنظام مراقبة ذكي يقيس الظروف الصحية للغواص تحت الماء، وموقعه ويعرض القراءات على شاشة LCD مثبتة على القارب المتصل ويرسل القارب هذه القراءات إلى عامل الإنقاذ في حالة الطوارئ. تم تصميم المشروع باستخدام متحكم أردوينو الدقيق وأجهزة الاستشعار. اتباع منهجية النموذج V لإكمال التصميم والتحليل والاختبار تظهر نتائج الاختبار التنفيذ الناجح للأهداف حيث تمكن المشروع من قياس معدل ضربات قلب الغواص ودرجة

حرارته بدقة 10% مع الضغط تحت الماء. تم عرض القياسات بنجاح باستخدام كابل CAT 5 بطول 5 أمتار على شاشة LCD وتم إرسال مكالمة طوارئ إلى القائم بالأعمال مع معلومات الموقع كرسالة نصية قصيرة باستخدام اي شبكة خلوية متاحة

Keywords: Sea diver, health monitoring, microcontroller, emergency call

1. INTRODUCTION

Diving is one of the important parts of the daily life of a sector of society. Divers work underwater searching for valuables and performing various tasks of exploring the sea and for different types of jobs such as offshore divers who work for oil and gas companies. Sometimes they build and maintain underwater structures used in oil and gas productions. The diver's job may also be onshore working on engineering projects such as dams and. Naval divers work in cleaning yachts and ships, scientists collect scientific data, and media divers work for their TV channels. Overall, diving is a safe activity; yet sometimes it holds the possibility of death that all might face, either expert divers or beginners. Robert Quigley, M.D., said that the ambient pressure changes are one of the most dangerous factors in diving [1]. D.Phil., who is the regional medical director of the Americas for International SOS, said when the pressure surrounding the body in the water increases, it changes body conditions and affects all body parts, sometimes changing the proportions of harmful gases [1]. According to the US TODAY newspaper, most diving dangers are a result of the effects of the increased water pressure; however, some dangers occur due to faulty equipment [2].

This project aims to reduce possible danger to divers by establishing a connector between the diver and other people to monitor the diver's condition. Since the connection between the diver and boat is through the cable, the project focuses on the divers who work in a specific area. The diver condition monitoring device is designed to measure the diver's heart rate and temperature to make sure that diver is in the best conditions. The measurement of the diver is sent via cable to the boat and displayed on LCD. Then in an emergency case, the diver measurements with location information are sent as SMS

to the caretaker. The system is cheap and does not bother the diver's missions. The application of this project is underwater like an ocean, sea, or river. The sensors are installed on the diver's body and the main circuit is on the boat to take the readings and send them to the caretaker in case of emergency. The rest of the paper is organized as: The second section outlines the state of the art literature review, the third section elaborates on the methodology adopted to implement this project, and the fourth section discusses the simulation and hardware implementation results while the fifth section concludes the discussion and provides recommendations.

2. RELATED WORK

The study carried out by [3] talks about a monitoring device design that helps in finding the exact location of the health conditions of the police force and then sends the data to the headquarters. This information can deal with any crisis. The system consists of two units: The Police Officers' unit and Control Room's unit. The Police Officers' unit represents a police officer's body with a temperature sensor and heartbeat sensor. The temperature and the heart rate are measured and sent to Arduino. The message with readings is sent to the control room by using a GSM module and it contains a location measured by a GPS module. Each police officer will have a Camera Module and a Panic switch. The Panic switch should be pushed to inform the control room about the emergency and the camera module was used to take images and send them to the control room using WIFI. The Control Room's unit with PC and the GSM module is the main components of the base station. The police officer's measurements will be displayed on the PC. The data, which will be displayed on a PC, includes the police officer's Health conditions; temperature, heart rate, location, and emergency message to let the control room know about his situation and the images to show any related risks. This project also finds the police officer's location and takes a real-time image. All these data are sent to the base station to let the caretaker know the police officer's situation. This project can be improved by allowing all the police officers to communicate with each other while doing their missions. This project provided us few very important technical details to complete our objectives.

Another design and analysis is presented by [4] as a smart system to monitor diver's health underwater using acoustic communication. In the present time, diving has become popular to discover underwater environments. Health issues are the worst diverse concerns. Therefore, in this project, they design a smart system for divers with various health sensors. Then send the measures to the boat. The data transition and receive are analyzed by using LabVIEW. The acoustic transmitter is installed on the diver and a hydrophone is affixed to a distant boat. The transmitted and received data are connected wirelessly between the diver and the boat. The overall block diagram has three sections. The first section is the transmitter, which refers to the system on the diver. It includes health sensors, a data analysis module, a power amplifier modulator, and an acoustic transmitter. The sensors' results are passed to the data analysis section, which is a microcontroller. The data will be checked with the

standard readings for normal people. Up to that, the alert will be sent in the emergency case. The modulation section will receive the output from the data analysis section. Then a power amplifier will amplify the signal in which at the end, the amplified signal will be sent to the acoustic transmitter. The second section refers to an underwater channel. The third section refers to the receiver that is on the boat. It consists of the hydrophone, de-modulation, pre-amplifier, and display screen. The passive receiver (Hydrophone) will receive the signal transmitted from the acoustic transmitter. The diver's health reading will be shown on LCD. This project can be improved by reducing the data and power losses by transmitting the signal if there are only health issues, not sending the data continually, and increasing battery life.

Another study done by [5] is mainly about designing a system that monitors animal health. Animals, as well as humans, can get diseases related to temperature, heart, and blood pressure, which negatively affect their health. Therefore, the owners need a system to monitor the animal's health condition. In this project, they build a system with different sensors to mount the system on the animal's body to get the measurement. The prototype will consist of a blood pressure module, Electrocardiogram (ECG) module to measure heart rate, temperature sensor, and respiratory rate. This system will take care of the animal's health. All the measurements result will be displayed on LCD. The Internet of Things (IoT) can be used to transmit the data in this project to improve it further.

Another study by [6] presents a monitoring system that tracks the physiological effects of heat exposure. This system measures oxygen saturation, heart rate, temperature, physical activity levels, and galvanic skin response. All the sensors will be connected to the microcontroller and the measurements will be stored on the device for more than two days. The system measurements are compared with clinical standards, such as infrared thermometry and fingertip pulse oximetry. The last form of the project is applied to a human's hand. This project talks about a smart system to monitor heat risk and physiological assessments. The device measures oxygen saturation, heart rate, temperature, physical activity levels, and galvanic skin response. The measurement is compared to clinical standards. The system is worn on the upper arm and the device needs manual data transfer from an SD card. They can improve the project by improving the temperature, the electrochemical sensing, and minimizing the device to become more comfortable. Moreover, exchange commercial sensors with sensors that use emerging bio-fabrication techniques. In contrast to these state-of-the-art projects, which are costly, we intend to design a simple cost-effective project to perform similar tasks conveniently meeting our objectives.

3. METHODOLOGY

V-Model is based on the development life cycle model, which is one of the most known engineering software and hardware development methodology that provides the validation and verification of the

development processes. It has sequential steps moving down in a linear way with an option to improve the project at intermediate stages enhancing the development life cycle directly associating the testing phase in every single phase [7]. Our project followed the steps of the V-model methodology while working on the objectives. The block diagram for our designed project is illustrated in figure 1.

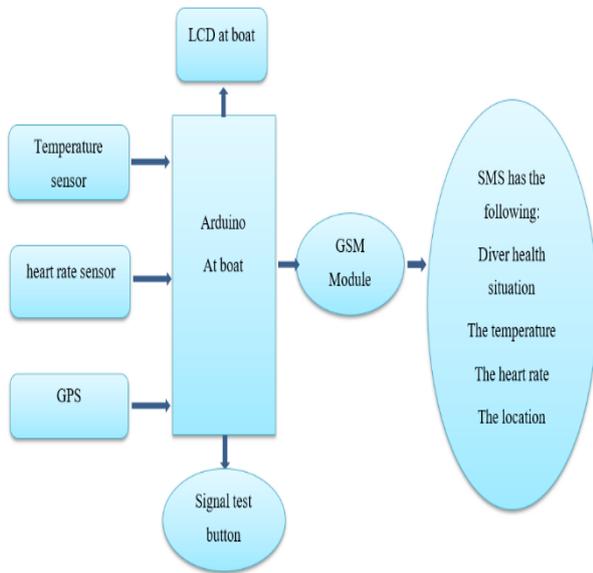


Figure 1: System Block Diagram

The functional block diagram of the system has six major functions. The temperature sensor is connected to the Arduino to sense the human temperature. While the heart rate sensor is connected to the Arduino to sense the human heart rate. Location module connected to Arduino to detect the boat location. The test signal is connected to the Arduino to detect whether there is a signal or not. The LCD is connected to the Arduino to display the output readings. The GSM module is connected to Arduino to send SMS messages which include the readings of human temperature, human heart rate, and the location of the boat. The details of connections are provided in table 1 while the flow of actions is demonstrated in figure 2.

Table 1: Input, Output, and Processing of the System Block Diagram

Input	Output		Processing
Measure temperature, Measure heart rate, Measure location	Readings on LCD: Diver health situation The temperature The heart rate	SMS with the following readings: Diver health situation The temperature The heart rate The location	Arduino Uno

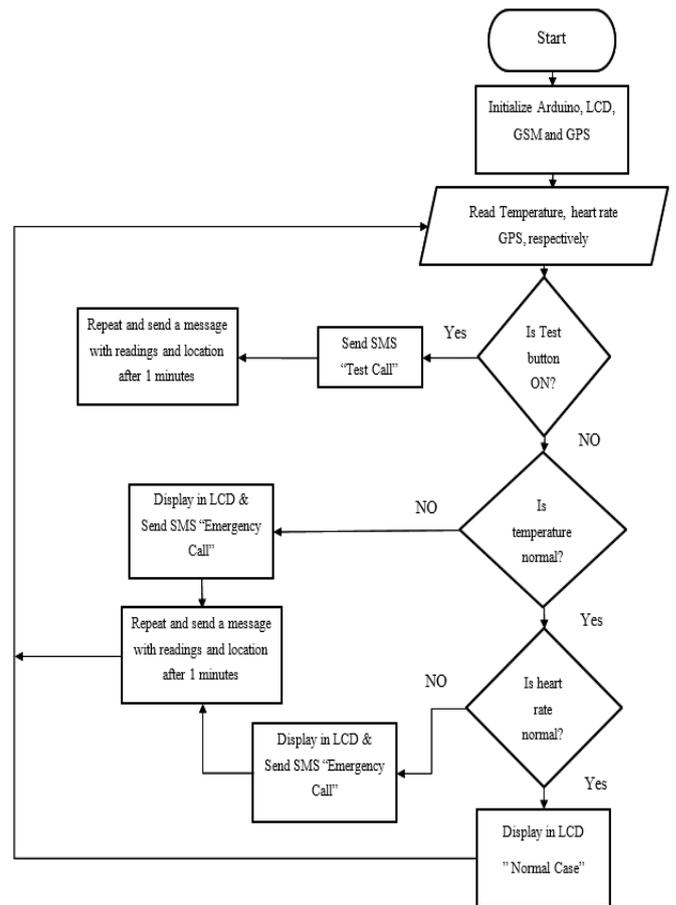


Figure 2: System Flowchart

The normal temperature is assumed as: $(36 < T < 38)$ and the normal heart rate is as: $(60 \leq HR \leq 100)$ for the design and analysis purposes. The process starts by initializing the Arduino, LCD, GSM module, and GPS module. Then, there is a switch, so when the switch turns ON, the system will send a test call message to check the signal availability. The message will be repeated and sent after 1 minute. If the switch turns OFF, the system will check the standard readings of temperature $(36 < T < 38)$ and check if the condition is correct, the system will check the standard condition of the heart rate $(60 \leq HR \leq 100)$. So, if the condition is correct, the system will display "Normal Case" on LCD with the rest of the readings. Then, the system will start to take the readings again. But if the temperature reading $(36 < T < 38)$ is not correct, the system will send an "Emergency Call" to headquarter with the readings and location. After every message that shows sickness readings, the message will be repeated and sent after 1 minute. For LCD initializing, first, it displays clear. Second, function set: DL=1; 8 bits interface data. Then N=0, 1 line display. After that, F=0, 5*8 dots character font. Third, display ON/OFF control: display off, cursor off, blink off. Finally, enter mode set: I/D=1, increment by 1 and S=0, NO shift. The library header files must be included in Arduino IDE to program the LCD. The Arduino initialize with a baud rate of 9600. Starting with the Arduino software has to be installed. Then connect the USB cable to Arduino. The green power LED means Arduino works. After that, install the board driver. Then open the first sketch. Next, choose the type of

Arduino and port, and upload the program. After a few seconds, the board RX and TX LEDs will blink. When the program is uploaded successfully, in the status bar, "Done uploading" message will appear. Finally, the orange LED in pin 13 will blink which means the Arduino up-and-running.

The temperature sensor and heart rate sensor do not need any initialization. The GPS Neo-6M module initializes in 500us. The baud rate for this module from 4800bps to 230400bps with default baud 9600. When the green color blinks the GPS module is working. The red color refers to the power connection. LCD will take the Arduino readings as input then display them on screen as output. The temperature sensor takes the input value as human temperature, changes it to voltage, and gives the output as a temperature analog signal. The heart pulse sensor takes the input value as a human pulse and gives the output as a heart pulse analog signal. The GPS takes the input value from any location on the earth and displayed it as altitude and longitude. The output is connected to the serial port of the microcontroller and the output value gives as latched or pulsed. Latched refers to the line that holds the state until it receives the change state command. So, the location of the diver in this project is stated as GPS output. The input of the GSM module is the output readings from sensors. The output will show the SMS message including all the readings. The relation between the temperature sensor and voltage can be found using equation 1:

$$V_{out} = 10 \text{ mV}/^{\circ}\text{C} \times T \quad (1)$$

Where T is the temperature in C, and V_{out} is the temperature sensor output voltage. As shown in the function when the output increase by 10 mills volt, the temperature increases by one. For GPS to know the satellite position, the Cartesian coordinate (X, Y, Z) should be sent which is known as WGS-84. Where X-axis refers to the Prime Meridian, Z-axis refers to the North Pole, and Y-axis refers to the right angles to X and Z. To know the Pseudo range the function clarifies the relation between Pseudo range and time difference we use equation 2:

$$\text{pseudorange} = \text{time difference} \times \text{speed of light} \quad (2)$$

Where the Pseudo range is the range includes clock errors. The relation of getting heart rate is determined using equation 3:

$$\text{heart rate} = \text{frequency} \times 60 \quad (3)$$

The relation between the GSM input and the output is ensured by writing code in Arduino software in AT command.

4. RESULTS AND DISCUSSION

The project is simulated by the proteus program. For the simulation results analysis, the test points are described in this section as; TP1: Display the values of temperature in a serial terminal in proteus. Also, in a serial monitor in Arduino IDE for different input values at the ADC pin of the microcontroller. TP2: Display the values of heart rate in a serial terminal in proteus. Also, in a serial monitor in Arduino IDE for different values of the ADC pin of the microcontroller. TP3: Send GPS initialization and test it turns ON in proteus in a serial terminal. Also, in a serial monitor in Arduino IDE. TP4: Send GSM initialization and test it turns ON in proteus in a serial terminal. Also,

on a serial monitor in Arduino IDE. TP5: compute all input values, display them in a serial terminal, compute all input values, and display them in LCD. Figure 4 demonstrates the designed system in simulation.

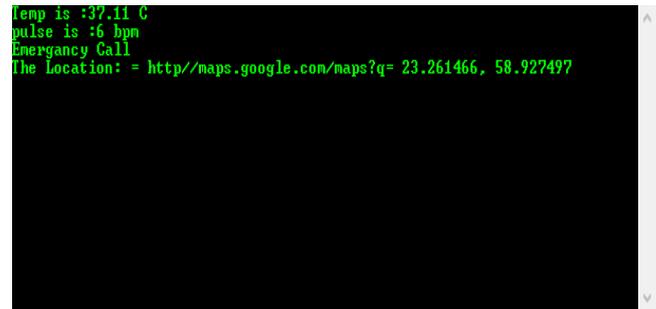


Figure 3: Final output display in proteus

The final output of the simulation result is shown in figure 3. As we see since the heart pulse is not normal the system sends Emergency Call with the readings and location.

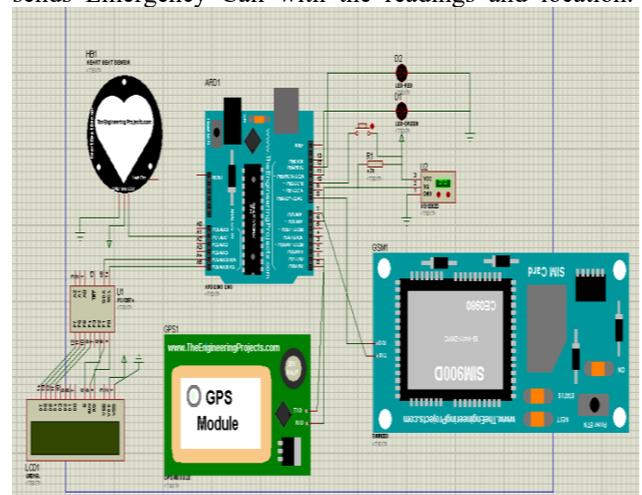


Figure 4: Simulation Circuit diagram



Figure 5: Output result for hardware implementation for Normal Case

Figure 5 shows the output result for a "Normal Case". Since the temperature=36 and pulse=96 are normal readings. The system shows the diver's case as "Normal Case" with numerical readings. The output result for Emergency Call is shown in figure 6. Since the temperature=29.12 which is not normal reading. The system shows the diver case as "Emergency Call" with numerical readings.



Figure 6: Output result for hardware implementation for Emergency Call



Figure 7: Output result for hardware implementation for Test Call

Figure 7 shows the output result for Test Call. When the toggle switch is put ON, the system will test the network connection.

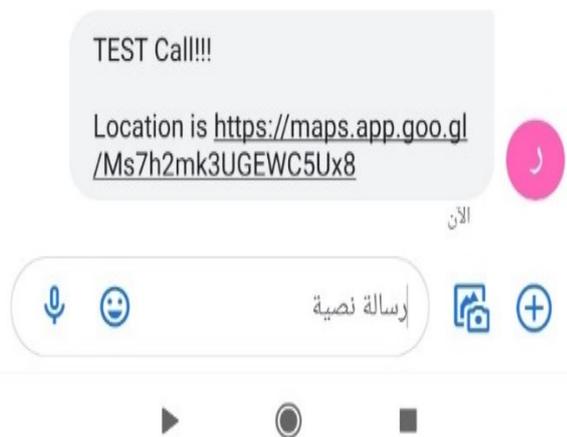


Figure 8: Test Call sent to headquarter through SMS

To check if there is any signal in the diving place. The toggle switch is switched ON to send test call messages through SMS as shown in figure 8. If a test call is received, then they can start the work.

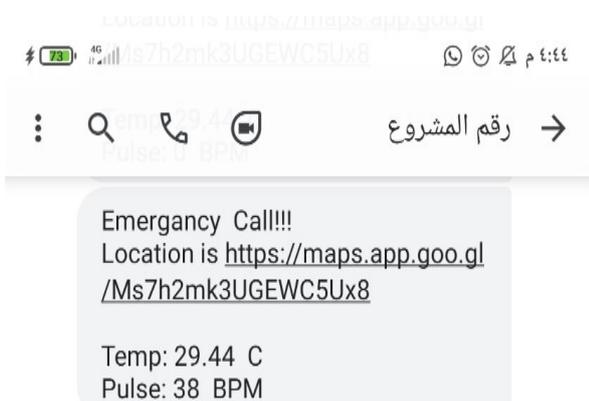


Figure 9: Emergency Call sent to headquarter through SMS

In case if there are emergency calls, the system will send an emergency call to the caretaker with the readings of temperature and heart pulse through SMS as shown in figure 9.

Table 2. Testing point for project functional units

Test cases at test points	Design Value	Simulation value	Implemented value
TP1	36<T<38	34.18	34.81
TP1	36<T<38	35.16	34.88
TP1	36<T<38	36.16	34.94
TP2	60<HR<100	61	83
TP2	60<HR<100	63	86
TP2	60<HR<100	74	44
TP3	Test GPS module	Test successful	Test successful
TP4	Test GSM module	Test successful	Test successful
TP5	36<T<38 60<HR<100	Temp:37.11 Pulse: 6	Temp:36 Pulse: 96

Since the objectives are to find the measurement of the diver's temperature and heart rate. Then pass the measurements to the boat via cable and display the results on LCD. Finally, pass emergency conditions and boat location to the headquarter via SMS. In addition, as shown above, the results of system simulation and hardware implementation have been achieved; so, the system meets the objectives of the project successfully.

6. CONCLUSIONS

In conclusion, the aim of the project, which was to design a system that measures diver health, is achieved. Four literature reviews have been studied in detail. Furthermore, V- the module methodology has been used in this project. Moreover, simulation, testing, and implementation of the project have been explained. The objectives of the project were achieved since the device measured the diver's temperature and heart rate successfully. In addition, all the measurements pass via cable to the boat and are displayed on the LCD. Besides that, in emergency cases, the SMS message is sent to the caretaker. In the future, this project can be improved by adding an oxygen level sensor. Also, making the connection between diver and boat wirelessly using any new technique that works inside the sea. It will be cheaper by applying solar energy since Oman is a very hot country. In the future, we aim to extend this work by working on accuracy, and cable length extension.

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Mobile Application for Order Management at Oman Cables Company

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ABSTRACT: An ordering management solution allows you to view see and manage all orders placed. Some solutions offer both- way sync, which guarantees that order data is shared across the order system solutions and the ecommerce site and enables seeing the entire process. This will help automate the movement of customer orders data throughout the distribution chain. The purpose of this research pertains to developing and designing a smartphone app to be used by Oman Cable Company that allows customers to order and authorize cables from the site as quickly as feasible. The Internet is used to run this smartphone app. This app is beneficial to Oman Cable Company since it speeds up the process, expedites the application process, and approval. The entire info needed in this project was acquired through survey questions in order to meet all system criteria. Rapid application development (RAD) was used to create the smartphone app with smooth ordered administration, unified customer service, worldwide inventory, and procurement, the application had a favourable influence on the organization.

الغرض من هذا البحث يتعلق بتطوير وتصميم تطبيق للهواتف الذكية لتستخدمه الشركة العمانية للكابلات يسمح للعملاء بطلب وتفويض الكابلات من الموقع في أسرع وقت ممكن. يتم استخدام الإنترنت لتشغيل تطبيق الهاتف الذكي هذا. يتيح لك البرنامج إدارة الطلبات وعرض جميع الطلبات المقدمة وإدارتها. وتوفير بعض الحلول المتزامنة في كلا الاتجاهين ، مما يضمن مشاركة بيانات الطلب عبر حلول نظام الطلب وموقع التجارة الإلكترونية. ويتيح رؤية العملية بأكملها. سيساعد ذلك على أتمتة حركة بيانات طلبات العملاء عبر سلسلة التوزيع. يقوم ، بتسريع عملية التقديم ، والموافقة. تم الحصول على المعلومات الكاملة المطلوبة في هذا المشروع من خلال أسئلة الاستطلاع. من أجل تلبية جميع معايير النظام. تم استخدام التطوير السريع للتطبيقات لإنشاء تطبيق الهاتف الذكي مع إدارة مرتبة سلسلة وخدمة عملاء موحدة وجرّد عالمي وشراء ، وكان للتطبيق تأثير إيجابي على المؤسسة

Keywords: Order Management, Customer Service, Inventory, Supply Chain, Mobile Application.

1. Introduction

This proposed project's topic is a smart application that accurately measures cable dimensions and power. The process's chosen company is "Oman Cable Company," which requires a smartphone app for all cable recognition type operations. The project's concept is based on a request according to thickness, colour, and length measurement using a cable application. This project simplifies the

calculating procedure for people and presents a simple method for determining the copper daily pricing. With this application, choosing the right size and type of power wire becomes simple. The app is highly important in the power systems sector for those who want to spend less time on solutions by using a software tool. The cable sizing method is enhanced and implemented using a trustworthy framework of evaluation of entire system of practices. The wire dimension measuring app [1] demonstrates the correct judgments made in the design and computation of a given process without resorting to simplification. The aim of this assignment is to design and develop a phone device app for Oman Cable Company that allows consumers to request and authorize cables from the site as quickly as feasible. The Internet is used to run this mobile application. This app is beneficial to Oman Cable Company since it saves a lot of time, expedites the application process, and expedites approval. All data required for this process was acquired through surveys, publications, and the internet to meet all system criteria. This technology aids in the development of the data recording and storage process, as well as its retrieval. We have established daily backup framework to restore data in the event of data loss to limit the danger of data theft. Due to the fact that most of the CMS (Content Management Website) store their data in a database, this is the case. The employment of this method assists both the user and the business in terms of saving time and effort, as well as determining if the stock is inadequate or complete.

The remainder of the paper is organized as follows: Section (2) focuses on literature review, Section (3) emphasizes on Methodology, Section (4) discusses the design and implementation, Section (5) focus on result and discussion and Section (6) conclude on the research.

2. Literature Review

According to [2], The volt selecting threshold, according to the author, is determined using a smartphone app that describes the voltages lines. For the procedure, the AC delivery system is applied, and subsea vehicles such as seabed infantry platoons, remote controlled automobiles, and digging machinery are engaged. The writer's development method involves wiring size and voltage amount based on a requirement of up to 7 MW [3]. Furthermore, electromechanical factors for the design of ideal parameters for power lines are offered, and the ultimate selection is taken to evaluate the variable. Significance sudden reduction in voltage, influencing power, power failure, conductivity expenses, cable interchange method, and upper and below strain pressure acting on the wirings are among the cabling factors.

According to the research team [4] different approaches are used to describe the same subject. The mobile product's ESD resistance level is enhanced using a valuable structure that delivers additional discharges over the management upgraded system. The integrated system is built on a PCB, and a subsequent discharge is recommended to strengthen the system's electrical discharges resistance. Through the secondary discharging channels

like voltages suppressant devices, air arc to interleaved suppressing equipment, the discharges power levels and noisy voltages are recorded and studied. The generated sounds and malfunctions are interleaved over the suppressing systems and sent to a high-quality display. The flattened coax cable design is elaborated with an approach based on the FPCB application areas in there search work of [5]. Weak signal problems and features are investigated, and the resistance to sound coming from outside is handled well. The connectivity of signals has numerous problems, especially in one wire design that offers automatic assembly with the wire, and the network design must give flexibility.

By using vacuum pressure machine, the versatile PCB processing structure enables both numerous and coax wire channels over the network.

Machine learning algorithms are outlined in research work [6] and [7] that accurately forecast the expense and difficult failures associated with subterranean fibre optic networks. To transport elevated signals, fiber optic cables were fitted to the transmitter and placed in submarine, subterranean, and airborne architecture. The expense for repairing method is widely used to handle cable faults, and feed-forward neural networks provide linear regression in mending issues. The optical network is reliant on industrial failures, repair delays, and a prediction model in the broken cable. The reliability of the results is produced using a predictive model that includes the expense of cable repair for the subterranean operation.

3. Methodology

The price and difficult failures associated with subterranean fiber optics infrastructure are accurately predicted using machine learning approach. To transport elevated transmissions, fiber optic cables were fitted to the medium and installed in submarines, subsurface, and airborne structures. The cost repairing method is widely used to handle cable faults, and feed-forward neural networks provide linear interpolation in fixing issues. The optic networks are reliant on industrial failures, repair delays, and a predictive modelling in the faulty cable. The correctness of output is produced using a predicted modelling that includes the price of cable repairs for the subterranean process.

The project uses three methodologies namely spiral model and RAD model, depending on the assessment requirements. The RAD model may be developed in shorter time, saving money and allowing the company to go back to work.

Based on study by [8] RAD is more adaptable when it comes to changes, but in the waterfall paradigm, modifying any requirement is not possible. Furthermore, with RAD, the majority of the production is completed in a short time using user input and assessment, whereas in waterfall, it is impossible to complete a project in a short period. RAD is a good methodology for longer programs since it is simple to track status, but development requires a specialised and professional staff. It is not, however, appropriate for minor tasks. Although the waterfall approach has extensive documentation and is basic and easy to grasp, it is not appropriate for complicated tasks. RAD is a methodology

that is ideal for smart security systems.

In RAD, rapid and effective progress can be made. Because it is important to take and assess the security after a certain period of time, as well as obtain customer feedback, the RAD model is preferable to the waterfall model in this scenario. Furthermore, because there is no budget constraint in this project, RAD is an appropriate methodology [9]–[13].

4. Design and Implementation

Figure 1. presents the context chart of the designed system.

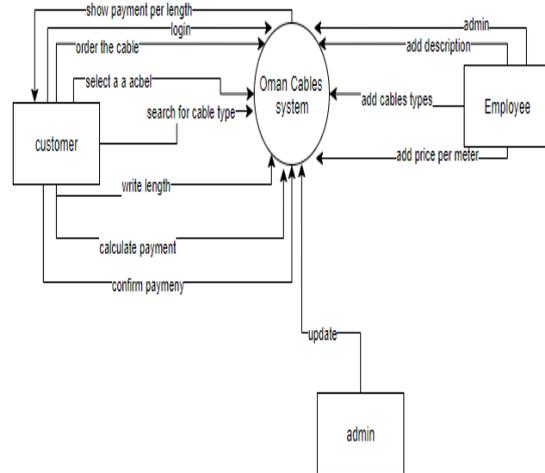


Fig. 1: Context Diagram.

Figure 2. displays detailed data flow chart (Level-0).

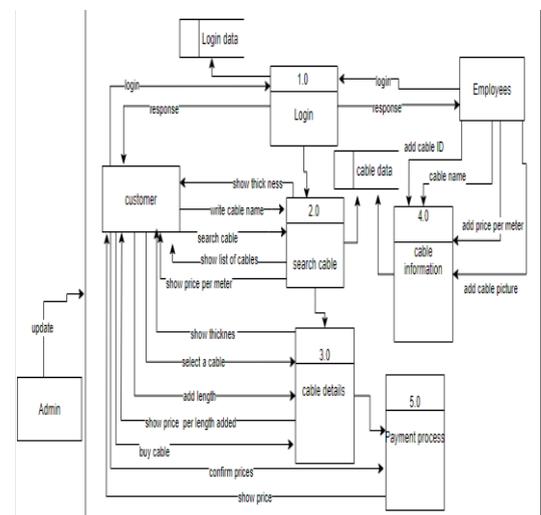


Fig. 2: DFD Level 0.

Figure 3. displays the use-case illustration:

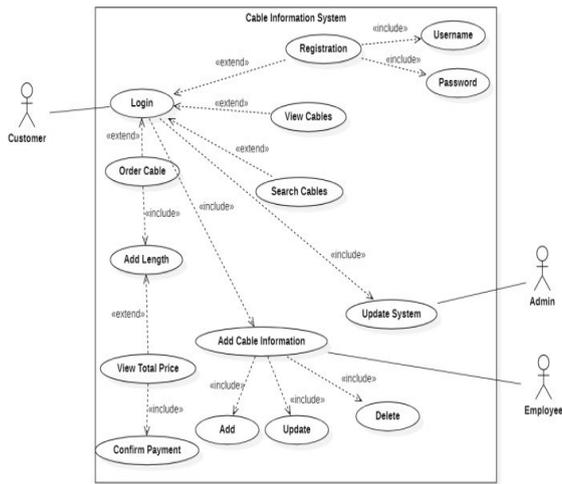


Fig. 3: Use Case Diagram.

Figure 4. presents the screenshots of registration interface and Figure 5.

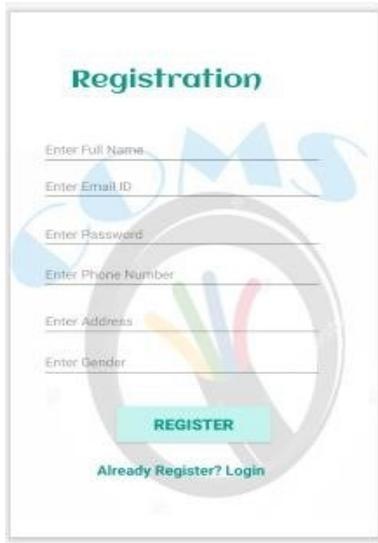


Fig. 4: Registration Screen.

Figure 5. Presents the screen for the user to enter his user's name and password to access the system as a prototype.



Fig. 5: Login Screen.

5. Result and Discussion

Data collection is a method for collecting and analysing project data in a methodical way. To acquire a full view of a project, there are a variety of data collection methods available, including interviewing, surveys, sightings, and more. A survey was one of the tools that we utilized to obtain data for this research that would help us finish it. To gather the information we need, we did a survey and sent it to a few people. The main goal of the poll is to see if the app makes it easier for users to buy from the smartphone application.

Figure 6 illustrates how the program supports the usage of the program since it minimizes the order's time and efficiency. 50 percent highly agree, 22 percent agree, 19 percent disagree, and 10% strongly disagree that it decreases order time and speed.

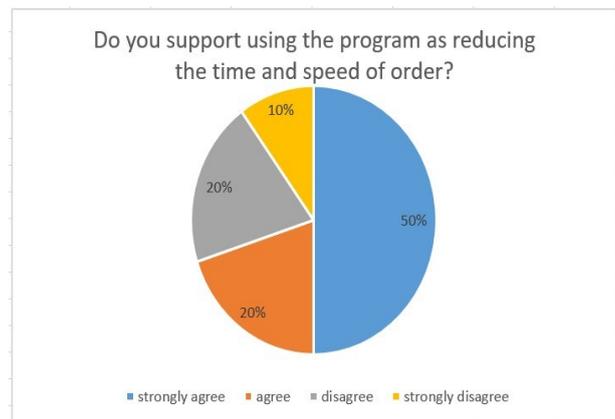


Fig. 6: Question 1 response pie chart.

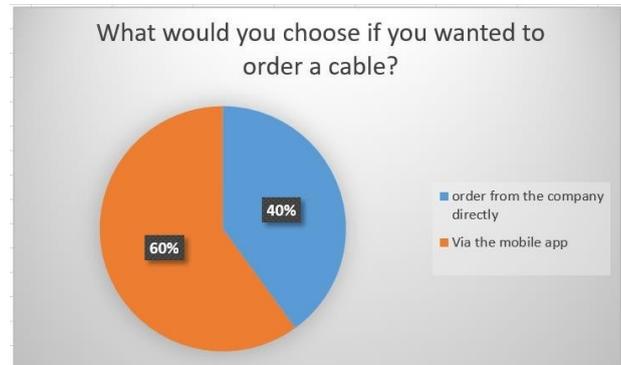


Fig. 7: Question 2 response pie chart.

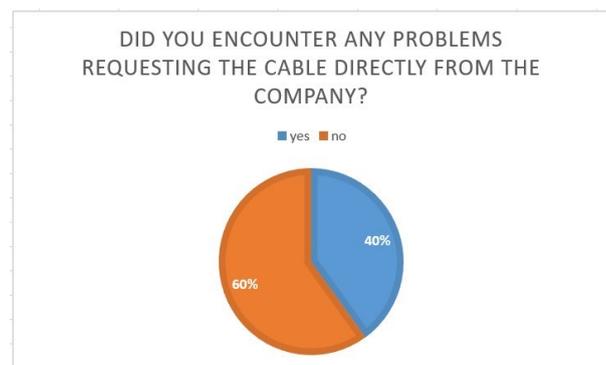


Fig. 8: Question 3 response pie chart.

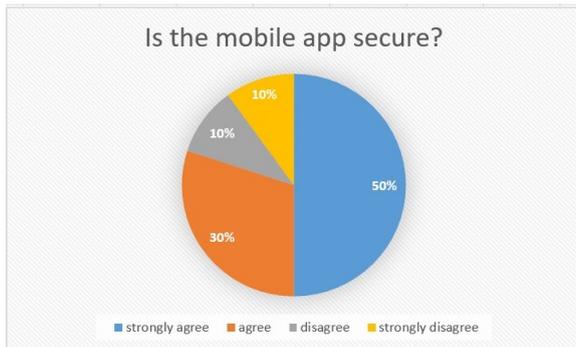


Fig. 9: Question 4 response pie chart.

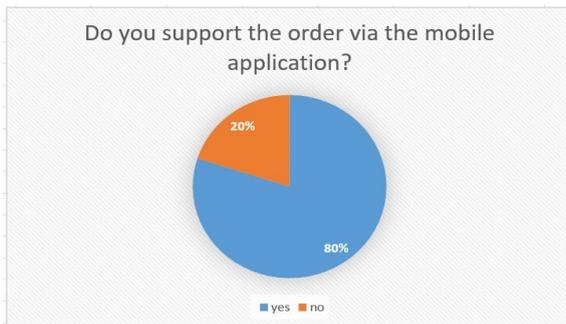


Fig. 10: Question 4 response pie chart.

6. Conclusion

The mobile application has been developed to increase the sales and manage orders that are placed online paving the way for e-commerce adoption for the Oman Cable Company. The application helps the company to automate the supply chain process and also the automated approvals. Limitation of the project is the security measures and that can be enhanced for future. Also, data retention and storage should be abided by the laws governed by the Sultanate of Oman.

Future, data can be utilized, and prediction and data visualization can help company to increase the sales and automate the process within due time. Customer's satisfaction and support can be provided. Data visualization can help for better decision making [14] [15]. Ecommerce helps the company to be the pioneer in this field in the country [16][17].

Acknowledgements

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The smart meters inventory control system for Mazoon Electricity Company

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Abstract

In every supply chain company, the most complex area is inventory management. In the absence of an adequate inventory management mechanism, the inventory will run out and the consumer will not be taken care of on time, such as using Excel. While spreadsheets and the like work well in the beginning when it's a small operation, it can lead to crippling problems. The company may not be able to track the movement of inventory, for example, it may include redundant data and errors and not promptly stored. Inventory management issues can lead to an inventory data crisis. On the other hand, having adequate inventory statistics can reduce financial and material costs, ensuring that customers' inventory requirements are met and thus inventory requirements are met. The profitability of the enterprise will not be negatively affected by inventory and consumer demand will not be met, which will have a significant financial impact on the business. The system used a spiral methodology for the development and the questionnaire is used for data collection. The system should ensure that inventory control and data are kept in one place and can be used for forecasting and reporting purposes. The company must think of ways to strengthen its supply chain management to maximize its effectiveness and reduce its vulnerability.

في كل شركة سلسلة توريد ، فإن المجال الأكثر تعقيدا هو إدارة المخزون. وفي حالة عدم وجود آلية كافية لإدارة المخزون فإنه سيفقد أولن يتم الاعتناء بالمستهلك في الوقت المحدد ، وعلى الرغم من أن جداول البيانات مثل استخدام Excel وما شابهها تعمل بشكل جيد في البداية عندما تكون العملية صغيرة ، إلا أنها يمكن أن تؤدي إلى مشاكل تشل حركتها وقد لا تتمكن الشركة من تتبع حركة المخزون ، على سبيل المثال ، قد تتضمن بيانات وأخطاء زائدة عن الحاجة ولا يتم تخزينها على الفور. يمكن أن تؤدي مشكلات إدارة المخزون إلى أزمة ثانية وهي أزمة بيانات المخزون من ناحية أخرى ، يمكن أن يؤدي وجود إحصاءات كافية للمخزون إلى تقليل التكاليف المالية والمادية ، مما يضمن تلبية متطلبات المخزون للعملاء وبالتالي تلبية متطلبات المخزون. لن تتأثر ربحية المؤسسة سلبا بالمخزون ولن يتم التأثير على تلبية طلب المستهلكين ، مما سيكون له تأثير مالي كبير على الأعمال. استخدم النظام منهجية لولبية للتطوير ويستخدم الاستبيان لجمع البيانات. ينبغي أن يكفل النظام الاحتفاظ

بمراقبة المخزون والبيانات في مكان واحد ويمكن استخدامها لأغراض التنبؤ والإبلاغ. يجب على الشركة التفكير في طرق لتعزيز إدارة سلسلة التوريد الخاصة بها لتحقيق أقصى قدر من فعاليتها والحد من ضعفها.

Keywords: Inventory Management, Supply Chain, Demand, Spiral Methodology.

1. Introduction

At Mazoon Electricity Company, the most complicated topic is inventory management. In the absence of an adequate inventory management mechanism, the inventory will run out and the consumer will not be taken care of on time, such as using Excel. While spreadsheets and the like work well in the beginning when it's a small process, it can also lead to crippling problems. The company may not be able to track the movement of inventory, for example, it may include redundant data and errors. Humane. Time use, each user gets their own gain, and it results in the data not being saved correctly.

Inventory management issues can lead to an inventory data crisis. On the other hand, having adequate inventory statistics can reduce financial and material costs, ensuring that customers' inventory requirements are met and thus inventory requirements are met. The profitability of the enterprise will not be negatively affected by inventory and consumer demand will not be met, which will have a significant financial impact on the business. The system should ensure that inventory control and data are kept in one place and can be used for forecasting and reporting purposes. The company should think of ways to strengthen the application in order to increase its effectiveness and reduce its vulnerability, and also for the sake of the consumer with less effort and time.

Problem faced by the company loss of data and it took a long time to search for it, the company / customer data will be compromised if there is no secure system and failure to meet customer requirements.

This system helps in developing the process of recording and storing data and facilitating its reference. To reduce the risk of data theft, we have made regular backups to recover data in case of theft. Therefore, because most content management systems store their data in the database. The application of this system benefits the user and the company in terms of reducing

time and effort and knowing the stock if it is deficient or complete.

Many governmental and private institutions and companies are looking for the best solutions to limit their meters, and making it easier for the customer to obtain services from the system requires more time and effort. For this reason, we want to implement a new smart inventory system.

The remainder of the paper is organized as follows: Section (2) focuses on literature review, Section (3) emphasizes on Methodology, Section (4) discusses the design and implementation, Section (5) focus on result and discussion and Section (6) conclude on the research.

2. Literature Review

About the smart meter inventory management system, there are many studies conducted, and the researcher uses many different methods and applications to build the system. Basically, a smart meter inventory management system helps the company to track the product in its business and overflow is avoided, so I chose this topic for app development. Inventory and ordering are done with additional stock for the management process [1]. By designing this equipment, stock unavailability is prevented through proper monitoring procedure. Through the tracking mechanism that helps the company eliminate the unavailability of the associated stock, the stock is made available. Properly performed to satisfy customers' inventory related needs. Traffic tracking is easy to understand and inventory tracking is performed and where the inventory is stored and its usability [2]. It is easy to organize the quantity of inventory and associated orders in the company. The inventory unit is the process of managing in a One of the logistical strategies that works in real time. From the moment of its acquisition and delivery to the final installation of the counter in the distribution network. The first entry and drain period is carried out in such a way that the counting is done after the forward supply of the picker is made available. The business system allows for better planning, resulting in lower stock requirements. The inventory unit system is capable of operating by program design in the system-driven approach and space is optimized through utilization and productivity process through the corporate warehouse.

[3] The smart inventory system is designed with network-based wireless monitoring and operating sensors that are implemented by sensors for inventory control operations. Data is provided in the enterprise network through renewal decisions. An inventory mechanism using the Arduino platform is suggested in this article, and local servers are used as the base station. Using the IEEE 802.11 family of WIFI, data is obtained from these sensors. With an open-source device this system (Arduino) works. The network-based architecture is capable of running with ASP.NET technologies in both local and web-based applications. In order to use IoT technologies in the network to produce better and advanced performance, the device chosen is able to operate in a real WSN environment. The system will track production plans and focus the system on WSNs to ensure demand monitoring and control efforts are based on the inventory process.

Realizes that the goal of monitoring the inventory of applications in the small market that the mobile phone consumers controlling the availability of products in the markets was in order to facilitate the minimum staff in organizing, processing and controlling the movement of inventory items that occurred in the minimart. A minimal inventory based mobile app was to have users' stock, with a list that was available in the form of product items, a promotional offer with limited reservations for promotional items. The application can make small store employees organize, process and monitor the movement of inventory item more easily. Small, medium, or large businesses may offer information on merchandise, price, purchasing, ordering and payment, as well as distributing products to consumers, potential buyers, and business partners around the world. Without space and limited time, the Internet acts as a means of reaching customers. In today's business world, it has become popular. For example, the phenomenon of new Android technologies has become a popular topic among gadget users. It is a portable operating system developed by Google and widely used in many countries, this system is designed with Android OS with MySQL database server and PHP as a bridge for communication. It allowed users everywhere to access the database provided by the mobile phone. The admin can also add, delete, and edit promotion information. Customer can use promotion list added by admin and can see promotion details. The consumer will then decide the original price, the discounted products, and the price ceilings. Via the online app, the consumer will purchase the products by entering the customer's address. The administrator will then create a list of reservations and select a driver to perform the delivery. The product control process is completed by 1D and 2D barcodes that are difficult to retain, according to as this technique is not reusable and not reusable. reliable. By using Android mobile apps with the RFID technology framework, search base projects are implemented to handle inventory. The android system is able to create and design the android studio program system which enables data sharing between NFC allowed. Collaboration with RFID tags transfers data quickly. The SSMC prototype was constructed in multiple ways similar to the way it is evaluated and the zero errors can be clearly observed using a programming approach. The publishing and debugging method are applied to ensure that the codes can eliminate the identified errors and correct them in a limited period of time. The debugging and programming code associated with the application ensures that the errors are resolved and found in a short period of time. The device is realistic and the database is running on real-time activities as the device is automatically synchronized directly. Manual SD card monitoring and wireless transferring process in correct way instead of device backup process. The graphical user interface associated with the prototype of the program has been professionally upgraded.

ASAP Services, the market leader in inventory and asset tracking systems, today announced a new mobile reporting feature that helps users create, customize and export reports created on their smartphones and tablets using the Passport mobile app. San Jose, California (PRWEB) - With the latest reporting functionality for the Passport mobile app, users can create, configure and export reports generated directly from their smartphones, making asset management and resource management more efficient on the go. The complete solution

to your tracking and management needs is our asset and inventory systems. The new feature helps you define the data to be generated in the report. There is an opportunity for Passport mobile users the option to specify specific columns and criteria that should be reported. To view asset numbers, locations, costs, model, and serial numbers, reports can be created. Typical data on the inventory side are volumes, tariffs, stock levels and positions, and specialist inventory control data such as lot numbers and expiration dates can be provided. The paper can be exported as a PDF or Excel file after the report is delivered and sent in an email, making it easy to monitor and send product information and assets. You can also use Motorola wireless barcode scanners, as well as use smartphones to scan barcodes and monitor inventory and belongings.

With RFID technologies, inventory control is done in real time. For this design, with long attempts, manual inventory changes are displayed correctly. Both internally and externally, stocks and surpluses are investigated. There are some challenges they face before the hardware stocks and retail stores that use the manual system get too tough. The current state of the division's retail inventory structure is unable to handle inventory adequately. The current system in use in these stores is manual and the information provided to them is individually scanned for all items in bar codes and errors are high in numbers which is very time consuming. By taking advantage of the concept of wireless work allowed by identification of radio frequencies, the new process is more efficient. RFID system prototyping involves useless and cost-effective methods of application. The practical system is to reduce costs, increase inventory accuracy, and perform real-time data analysis, while effortlessly extending its reach to any retail location. Infrastructure is a particularly beneficial position for the retail owner to design this system, With improvements in the inventory process, which correctly and efficiently recognizes the results in real time, and the system architecture guarantees maximum engagement that keeps consumers happy thanks to an advanced process [6].

3. Methodology

The inventory system helps in storing inventory and providing the data needed to control and manage it. Currently all information related to purchasing and order processing is stored by the intelligent inventory control system. This system also handles inventory variances and conversions. This project aims to allow cost-effective operations and reduce investments in inventory. It also benefits the consumer in choosing the service he wants as soon as possible. The current research aims to study, design, develop and implement the MZEC system and the systems known as the smart meter inventory control system. Mazoon Electricity Distribution Company assists the device in dealing with the inventory of meters with their parts such as modems, files, seals, etc., and they are used in many roles and operations of Mazoon Electricity Distribution Company. The system also provides an opportunity to research available inventory regarding termination items. Also, from this method many reports can be produced. The methodology selected for the project is spiral methodology [7][8][9][10][11][12][13].

4. Design and Implementation

Figure 1. shows context diagram of the application.

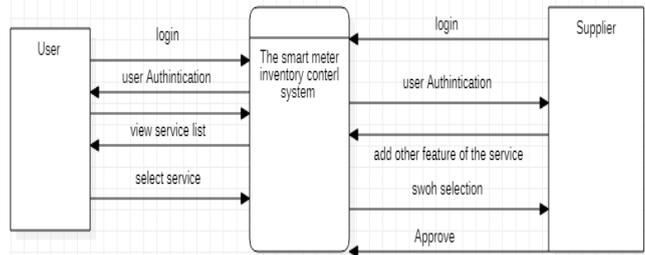


Figure 1. Context Diagram.

Figure 2. Data Flow Diagram (DFD).

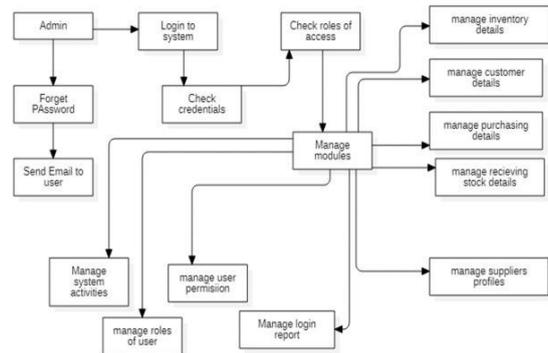


Figure 2. DFD Diagram.

Figure 3. shows the use case diagram.

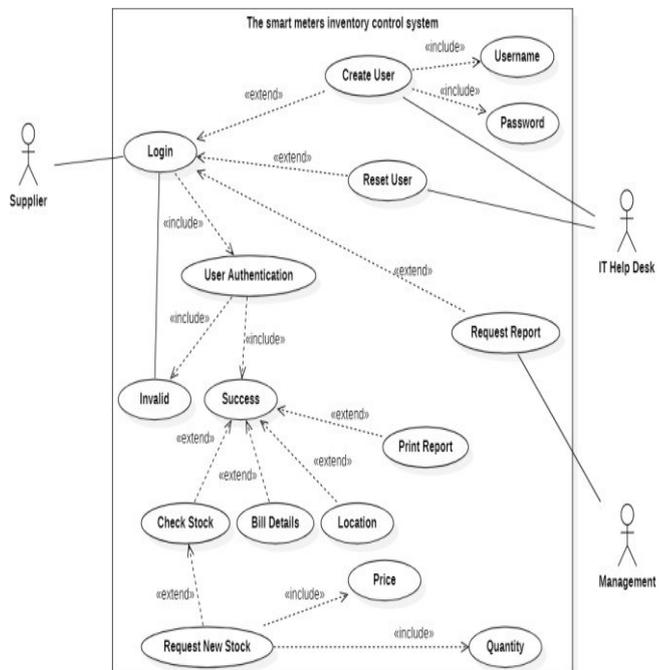


Figure 3. Use Case Diagram.

5. Results and Discussion

Analyse the data using charts and graphs for this study as shown in figures 4-7. First the data is analyzed, then converted into charts or graphs, then another discussion takes place to explain the results and draw the conclusion based on the data collected.

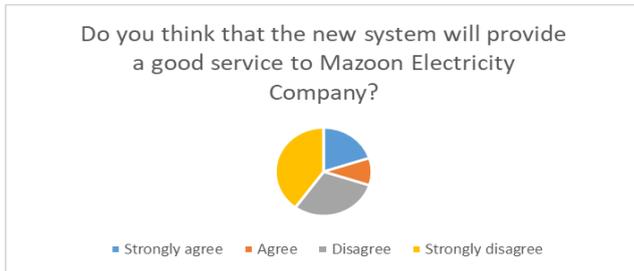


Figure 4. Question 1.

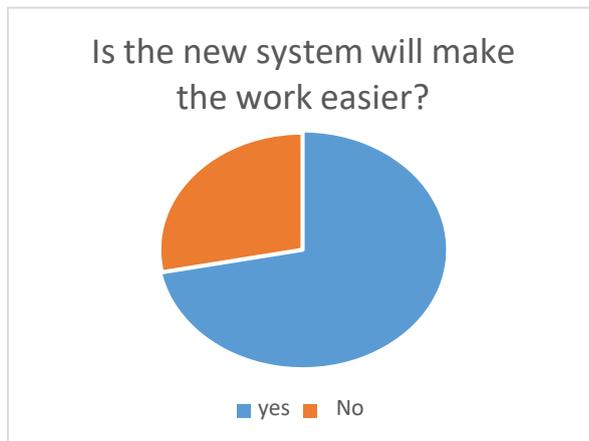


Figure 5. Question 2.



Figure 6. Question 3.



Figure 7. Question 4.

From the above data, it is evident that most people believe that the inventory system will be a robust and efficient solution for Mazoon Electricity Distribution Company, as it is the tool that enables tracking of records throughout the company's supply chain.

- 1) This improves the full range of communication.
- 2) Unavailability of stock stopped.
- 3) It turns traditional manual work into organized procedures and removes documents.
- 4) Reduces time and commitment for employees
- 5) It ensures continuous inventory control or regulation, so that items on ledgers remain in stock.

Interpretation of results as follows:

- 1) It looks at the results of the system in terms of its advantages or needs, which are: Accurate Inventory Tracking - Inventory enables accurate inventory maintenance or tracks a physical count. The traceability will be done by analyzing an inventory of what the approximation states and any discrepancies can be identified later.
- 2) Rapid detection of inventory errors - whether there is a major miscalculation within the actual data or the visual data, issues like shrinkage problems, theft etc. are illustrated by the system cooler [14] [15][16].
- 3) Prevents Overstocking - It can be known through purchase that inventory can be restocked so that it is easy to prevent overstocking.
- 4) Track Inventory Transportation Cost and COGS - Basically, how much cost is required in the business to manage inventory from inventory. Inventory also helps in considering whether more or less production is needed for the organization to keep up with costs or to maintain the same flow of income.

6. Conclusion

The application of smart meters inventory systems is a smart application and one of the most important programs developed and can be learned more through training courses. To achieve the goals of the project. The owner of the company can train on the application and train to easily receive requests from customers. Using Android Studio, small businesses can take advantage of the Meters Inventory System, which is a simple desktop support system. It contains all the essential features for small businesses. An application that allows us to update, attach and uninstall items according to specifications. Moreover, this software offers a simple daily log that displays daily income and transaction information, in addition to allowing the user to save time and effort. Fully convinced that completing this system will provide great benefit to the company.

Limitation is the security mechanism which can be enhanced further to secure the data and can be helpful in making an e-commerce application capability for future.

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Design and Implementation of Mawhiba Mobile App

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Abstract

Youth in Oman have a great role in promoting it. The youth are the pillar upon which a strong society rests, and they are the basis of urbanization and progress. The main objective of the study is to support Omani youth talent, in particular, commercially using mobile applications. This application is designed for talented youth Omanis, the application will be cross-platform. This application provides necessary information for talented youth in Oman and examples of some of their work. This application will be designed for talented young people to be able to display their talents and attract customers to them easily. Dynamic systems development method used to develop the mobile application, interview and questionnaire used to collect data. It was found that the application was helpful to the Omani youth to showcase their talents to the prospective employers and to other users for motivating them to enhance their talents.

وللشباب في عمان دور كبير في النهوض به. فالشباب هم الركيزة التي يقوم عليها المجتمع القوي، وهم أساس التحضر والتقدم. الهدف الرئيسي من الدراسة هو دعم المواهب الشابة العمانية، ولا سيما استخدام تطبيقات الهاتف المحمول تجارياً. تم تصميم هذا التطبيق للشباب العماني الموهوب، وسيكون التطبيق عبر المنصات. يوفر هذا التطبيق المعلومات اللازمة للشباب الموهوبين في عمان وأمثلة على بعض أعمالهم. سيتم تصميم هذا التطبيق للشباب الموهوبين ليكونوا قادرين على عرض مواهبهم وجذب العملاء إليها بسهولة. طريقة تطوير الأنظمة الدينامية المستخدمة لتطوير تطبيق الهاتف المحمول والمقابلة والاستبيان المستخدم لجمع البيانات. وتبين أن التطبيق كان مفيداً للشباب العماني لعرض مواهبهم على أصحاب العمل المحتملين والمستخدمين الآخرين لتحفيزهم على تعزيز مواهبهم.

Keywords: Mobile application, Talent Hunt, Social, Youth.

1. Introduction

Youth in Oman have a great role in promoting it. The youth are the pillar upon which a strong society rests, and they are the basis of urbanization and progress. In addition, youth are the pillar on which societies advance and they are their arms. They provide great services to the people and the nation in several areas, including technical, scientific, sports, productivity, public services, security, and others. Sultan Qaboos - may God have mercy on him

- devoted a day every year to celebrate the Omani youth and in appreciation of their efforts and success on 26 September. He also stressed, may God have mercy on him, once again the importance of the role of youth in Omani society, as he issued a royal decree in 2011 in particular to establish the National Youth Committee to be the first forum for youth in Oman. He did not forget - May God rest his soul - what preoccupies young people, but rather contributed to developing it for the better. Moreover, Sultan Qaboos - May God have mercy on him - took an interest in educating youth and provided schools, universities and institutes in Oman. This project aimed to support youth talented in Oman. The main objective of my project is to support Omani youth talent in particular, commercially using mobile applications. This application is designed for talented youth Omanis, the application will be on IOS and Android. This application provides necessary information for talented youth in Oman and examples of some of their work. This application will be designed for talented young people to be able to display their talents and attract customers to them easily. All information required for this project was collected by interviews, books, questionnaires, articles and the Internet to fulfill all project and program requirements.

The remainder of the paper is organized as follows: Section (2) focuses on literature review, Section (3) emphasizes on Methodology, Section (4) discusses the design and implementation, Section (5) focus on result and discussion and Section (6) conclude on the research.

2. Literature Review

[1] discussed Evaluating Cross-Platform Development Approaches for Mobile Applications. The separated mobile phone market with at any rate five huge adaptable stages makes neighborhood improvement of compact (applications) a troublesome and costly endeavor. Cross-stage improvement may facilitate this situation. A couple of cross-stage approaches have emerged, which we bunch in an underlying advance. To consider strong cross-stage courses of action, we gathered a lot of rules to assess cross-stage improvement moves close. Considering these standards, we surveyed Web applications; applications made with PhoneGap or Titanium Mobile, and - for relationship - privately made applications. They present our discoveries as reference tables and sum up our outcomes. Our models have demonstrated to be reasonable for subsequent assessments. Concerning the methodologies, we discovered PhoneGap suitable if exceptionally close similarity to a local look and feel can be dismiss.

[2] discussed An Evaluation, Framework for Cross-Platform Mobile App Development Tools: A case analysis of Adobe PhoneGap framework. The 'Application economy' is an exceptionally worthwhile and serious market for free programming sellers as it possibly offers a simple parkway to arrive at a huge number of clients. Nevertheless, the versatile application scene is dispersed and an application designer needs to distribute the product for a few unique stages to have the option to serve a greater part of cell phone clients. Accordingly, many cross-improvement devices have been offered to disentangle this remaining task. In this paper, we present an assessment structure for looking at changed cross-advancement devices. We utilize this system to assess Adobe PhoneGap apparatus against local improvement in Android and Windows Phone stages. The aftereffects of a contextual investigation uncover that while the cross-stage procedure was anything but difficult to utilize, the appearance and ease of use of the application was average at its best. The business effects of these are likewise talk about.

[3] discussed The Java™ Language Specification Java SE 7 Edition. THE Java programming language is a general-purpose, concurrent, class based, object-oriented language. It is intended to be straightforward enough that numerous software engineers can accomplish familiarity with the language. The Java programming language is identified with C and C++ yet is coordinated rather in an unexpected way, with various parts of C and C++ excluded and a couple of thoughts from different dialects included. It is proposed to be a creation language, not an examination language, thus, as C. A. R. Hoare proposed in his exemplary paper on language plan, the plan has abstained from including new and untested highlights. The Java programming language is specifically. This particular unmistakably recognizes the aggregate time blunders that can and should be distinguished at incorporate time, and those that happen at run time. Order time ordinarily comprises of making an interpretation of projects into a machine-autonomous byte code portrayal. Run-time exercises incorporate stacking and connecting of the classes expected to execute a program, discretionary machine code age and dynamic advancement of the program, and real program execution. The Java programming language is a generally elevated level language, in that subtleties of the machine portrayal are not accessible through the language. It incorporates programmed capacity the board, regularly utilizing a garbage man, to dodge the wellbeing issues of unequivocal deallocation (as in C's free or C++'s erase). Elite trash gathered usage can have limited stops to emotionally supportive networks programming and continuous applications. The language does exclude any risky builds, for example, exhibit gets to without list checking, since such hazardous develops would make a program act in an undefined manner. The Java programming language is typically ordered to the bytecode guidance set and paired arrangement characterized in The Java Virtual Machine Specification, Java SE 7 Edition.

[4] discuss Xamarin Mobile Development. Versatile application improvement is a different climate and requires explicit dialects and devices. This makes improvement over numerous stages time and cost serious. Numerous arrangements have been introduced to address the issues of cost and variety, however none come without their own arrangement of bargains. This venture examined Xamarin

as a portable stage advancement apparatus taking into account cross platform improvement that uses a solitary programming language, local UI components, code sharing for reuse, and near native execution. In particular, we analyzed Xamarin's help for geolocation, bluetooth, shared libraries and local ties. Investigation demonstrated that Xamarin isn't a response for all issues, however a strong answer for the suitable use cases.

[5] discuss MYSQL database heterogeneous log-based replication. A framework and strategy for moving information between various kinds of frameworks, and specifically utilizes log-based replication to move information between various sorts of frameworks. As per an exemplification, the framework can be utilized to play out a one-time or introductory duplicate of the MySQL information from a source data set framework to an objective data set framework, as well as to imitate the on-going exchanges caught from a MySQL data set's double sign into one or extra non-MYSQL database(s) on a persistent premise, with the end goal that the two frameworks are synchronized for exchanges of interest. As per an encapsulation, full or halfway information changes can be extricated from the MySQL twofold log, alternatively changed, skipped or enlarged, yield or kept in touch with a document, and afterward applied at any of at least one objective frameworks (for example another MySQL information base, or a non-MYSQL data set), in this manner synchronizing the source and target frameworks.

3. Methodology

The best methodology for the system and the proposed program is the DSDM model, according to the requirements of this project and its many advantages. The DSDM model is very useful for small projects if the requirements are smooth and clear. We chose DSDM because it can help us to complete the project in timely fashion [6][7][8][9][10][11][12]. There are many reasons return to choosing this model, including: commitment to time and set budget, help in improving project quality, promptly showing results directly, displaying early projects success and failure indicators. In addition, all the essential functions are delivered on the time; the project is easy to track by quickly detecting and resolving problems.

4. Design and Implementation

Figure 1. shows the use case diagram for the project where 3 actors using the application, they are the admin, the talented person and the customer. The diagram describes the use case and the communication between them. Add sections, control, taking suggestions and complaints, login, doing the required works, registration, enter the sections page and choose the type of work. Provide the details of the desired work, submit suggestions and complaints, choose the appropriate section, choose the appropriate talented and record personal information. Payment, appointment booking, enter the talented persons list and logout.

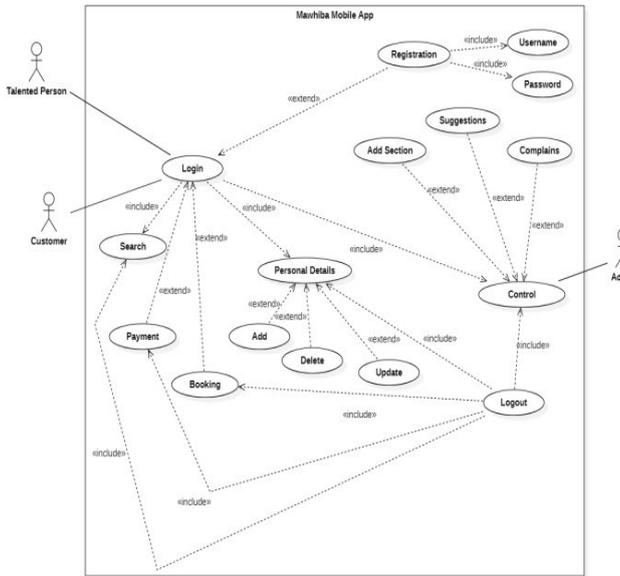


Figure 1. Use Case Diagram

Figure 2. shows the many entities and relationships between all the entities with features that represent talent support using a mobile app. In Figure 2, nine entities, and these entities are information that are the talented person, the customer, the admin, the talents sections, registration, login, appointment, required work (requests) and payment. The purpose of this diagram is to represent all the data stored in the database of the system and also to represent the relationships between the tables.

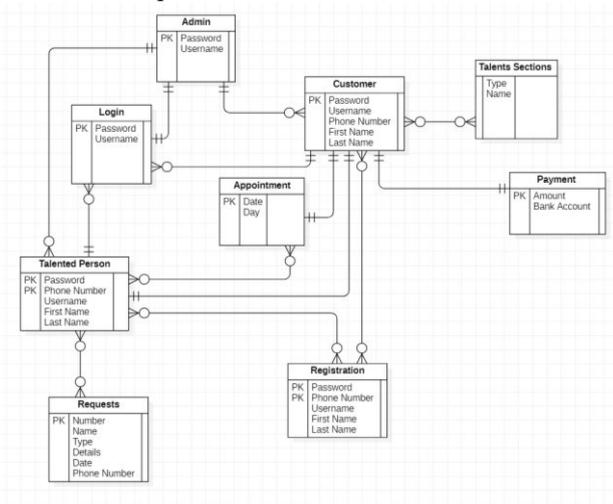


Figure 2. ERD.

The context diagram is a diagram that defines all the boundaries between the system and the system environment. It also shows all the entities interacting with it and is a high-level diagram of the systems.

Figure 3. shows all operations of external entities that use this application, such as Talented Person, Customers, and admin. Moreover, the flowchart illustrates the processes of each entity associated with the application. In addition to that the admin can log in and exit from the application and he can manage and control the application and he can add and modify the data for talented people and talents section, and also the customer can choose the appropriate talent section and then choose the appropriate talented person and then determine and choose an appointment. The talented person can log in to the application and view the customers' details, including information, dates, and

requests, and the customer can view the details of his request.

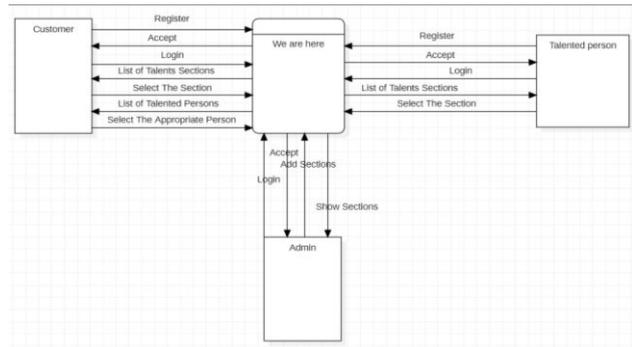


Figure 3. Context Diagram.

Figure 4. Shows the data flow diagram (DFD Level 0). Level 0 data flow diagram illustrates all the basic units in the system, as it depicts the data flows between all the different modules. Moreover, in this diagram it clarifies the sources of information and all the basic operations as it sheds light on the basic functions that the system performs when it penetrates its sub-processes.

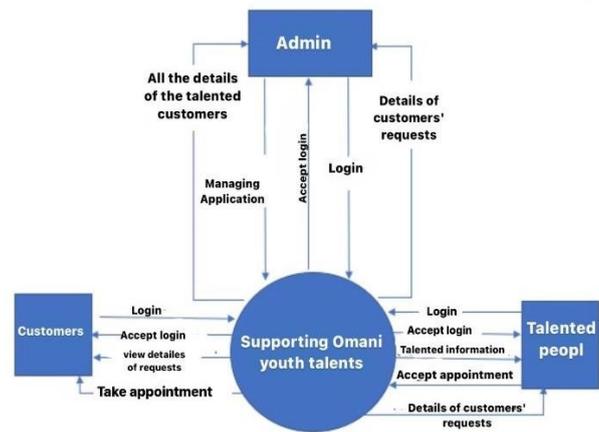


Figure 4. DFD Level 0.

Figure 5. Shows the data flow diagram (DFD Level 1). The purpose of a Level 1 Dataflow diagram is to detail and represent all system processes and each process alone, with the entity associated with them being explained.

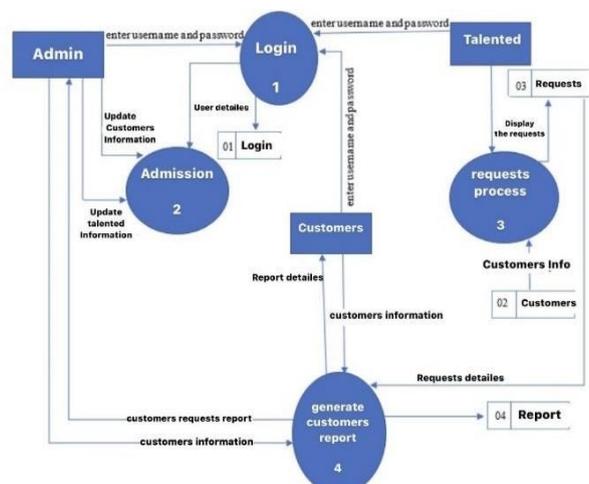


Figure 5. DFD Level 1.

Figure 6. Shows the registration page of the application and Figure 7. shows the home page of the application. Registration page is for register as talented person or customer. In this page the registrant must enter all required data like full name, user id, phone number and password. Home page is the main page in application and it is the user welcome page. Moreover, it is the page that includes the appointment page, the talents section page and the complaint page.



Figure 6. Registration Page.



Figure 7. Home Page.

5. Results and Discussion

Questionnaires is used to obtain the necessary information and data because it is the most important means used to collect data and it is the fastest way as it takes a short time to do it as a person can. It also saves effort and can cover all data needed. The questionnaire consisting of 04 questions and gave them to 30 talented young men. After obtaining all the data, counted it and analyzed it in the MS Excel program to obtain the percentages and results.

Figure 8. shows the first question of the questionnaire. Almost 42% people are choosing strongly disagree with talented youth Omanis get adequate support, that is mean they need more support to improve from themselves.

Q1: TALENTED YOUTH OMANIS GET ADEQUATE SUPPORT.

■ Strongly Agree ■ Agree
■ Disagree ■ Strongly Disagree

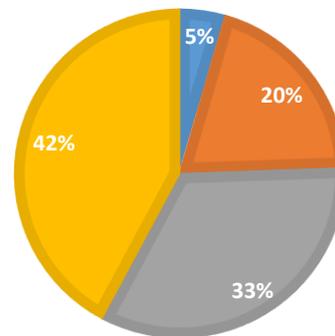


Figure 8. Question 1.

Figure 9. shows the second question of the questionnaire. Majority of the people choose yes, that is mean they need platform to support them talented and share it.

Q2: TALENTED YOUTH NEED A PLATFORM THAT SUPPORTS THEIR TALENTS.

■ Yes ■ No

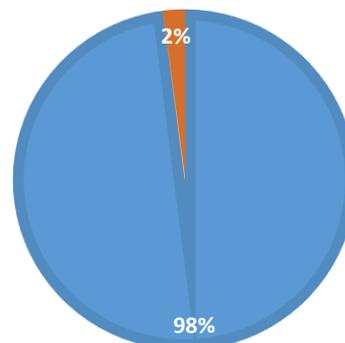


Figure 9. Question 2.

Figure 10. shows the third question of the questionnaire. Most of the talented youth are strongly agree with talent application will support talented Omani's youth.

Q3: THE TALENT APPLICATION WILL SUPPORT YOUTH TALENTS IN:

■ Excellent ■ Very Good ■ Good ■ Bad

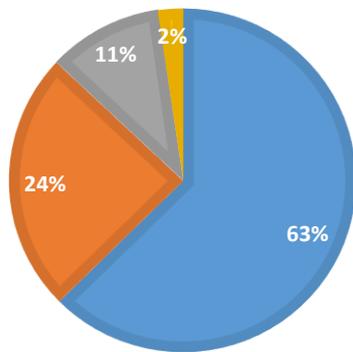


Figure 10. Question 3.

Figure 11. shows the fourth question of the questionnaire. This question was in the questionnaire because we want to know the effect of talented youth on society and whether they can contribute to the development of society.

Q4: YOUTH TALENTS AFFECT SOCIETY BY:

■ More Than 75% ■ From 50% To 75%
■ From 25% To 50% ■ Less Than 25%

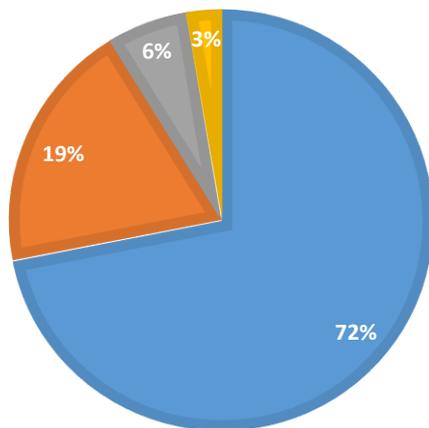


Figure 11. Question 4.

6. Conclusion

In this project, we designed and developed a mobile application to support and develop youth talents in Oman. Talented people can register for membership in the department that suits them, and this will help the talented youth to highlight their abilities and talent. In the application, there is a feature to add a new talent section, so the talents of young people in Oman can be easily identified. This application with its features will make it easier for customers to search for talented people by

entering the application and then choosing the talent section they want, thus choosing the right person. The application, in turn, helps talented young people to highlight their talents and encourages them to develop and develop them. Through this application, customers and talented people will benefit greatly

Limitation is the security mechanism which can be enhanced further to secure the data and can be helpful in making an e-commerce application capabilities for future[13][14][15]. The application is only available for android users. Data stored in the application needs to be secured so that it can be useful for future use. Data stored in the application can be useful to do predictive analysis using churn prediction to keep track of the registered users. Also, learning material and workshop can be made available for the registered users to enhance their capabilities to excel for their future endeavors.

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