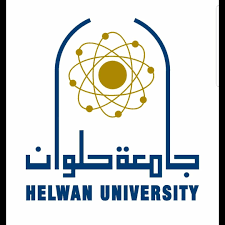
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**كلية الهندسة بحلوان**

**Electronics and Communications Department**

**Graduation Project 2022/2023**

**PROGRESS REPORT No. (1)**

|  |  |
| --- | --- |
| **Project Title** | **Vehicle Emergencies** |
| **Name of the Student** | **Nada Ismail Zaki - Sara Hany Mohammad** |
| **ID** | **21065 -18038** |
| **Supervisor** | **Dr. Mohammad AlDakrory** |

**For The Month of December, 2022**

**(Use separate sheets, for each of the items A, B, C, … if space provided in this sheet is not sufficient)**

**1. Problem statement**:

As many vehicles are subjected to many kind of emergencies everyday like accidents, car breaking down for any reason, they may lack the ability to communicate and ask for help in critical situations, this project aims to implement a system that can receive the vehicle emergency correctly and take action depending on the type of emergency faced

**2. Project Objectives:** (State the objectives that the proposed project aims to achieve)

The projects aims to help with 2 types of emergencies:

1. Serious accidents
2. Car breaking down (for any reason)

Each type of these emergencies is going to be direction to the right conduct that can actually help whether it was the ambulance or help that be directed to the emergency

**3. Introduction:**

The idea of the projects evolves around a central receiving unit, which will receive the emergency from the telematics control unit’s GSM (SMS will be sent), and upon receiving it will filter out the emergencies and will send each emergency to its right direction,

* If it is an accident, the direction will be an ambulance car, and then to the hospital that is to receive the patient(s) in ambulance car
* If the car broke down , the information will be directed toward a **web application** that will show the information of the car driver , his phone number (id of the emergency), his car number, his location**, and what has caused the car to breakdown**

**4. System Description:**

Diagram

Description automatically generated

As the figure illustrates, the **first input of the system** will the SMS coming from the TCU,

As the **Central raspberry pi** receives it, it filters the type of emergency,

1. if it is a **breakdown-call (Bcall):**

Then the SMS received will be directed to a **Web Application,** that will be used by a dispatcher so that it can **send a response SMS** back to the mobile number of the driver that have had the breakdown emergency.

\*The figure shows the Web-application: to be hosted on the raspberry pi and accessed through a local network, **however, an update was made that that web application would be better hosted on AWS CLOUD, as this will be a much more realistic scenario and will provide multiple advantages like:**

**-Higher availability (servers have very rare probability of *completely* failing in the cloud)**

**-Higher security (through the accomplished infrastructure in the cloud )**

**- and most importantly enables remote access**

The web application , as any, consists of a front end and a backend that later communicate with each other using their APIs.

After the dispatcher provides the response through its web application , the response is saved in a **SQL database**( along with the other information of the emergency in one record the database as well), the response it fetched from the database and sent to the phone number of who is having the breakdown.

The fetching of SMS , its filtration (done with parsing) and the entry and exit the information from the database is done using the application layer on the central raspberry pi.

1. If it is **an Emergency-call (Ecall):**

The SMS is then directed to ambulance car will receive it through a GSM module as well.

The text of the SMS will appear to the ambulance car on the an embedded screen( **on another raspberry pi as well )** in the car that has a specifically made GUI.

The details of the ambulance can then be directed to a hospital server, to the hospital of the area, the ambulance is will likely head to, there, they can view the details of the emergency, its severity and prepare for the patient

**5. Technical Specifications:**

The 2 raspberrypis will have a specially made image(operating system) that will be designed for its targeted embedded system to ensure the efficient operation of the used hardware resources. **( Embedded Linux using The Yocto Project Tool )**

The Web application will be implemented using Front end Creation tool and the backend will be implemented using Nodejs , to ensure that the web application is interactive and dynamic

(changes as the database changes). **( Web application Development)**

The Web application will be deployed using AWS cloud infrastructure and services, The **Storage gateway service from AWS** will ensure that the database present on the raspberry pi receiving the emergencies is synchronizes with the database present on the server in the cloud. **( Infrastructure and services as a code development)**

The SMS fetching/sending programs – The GUI (using QT) of the ambulance car , will be the application layers that will operate upon the integrated image(OS**). ( Application layer Development)**

**6. List and describe the latest components selected for the proposed design till now:**

2 Raspberry pi

2 GSM modules

1 HDMI screen

**7. Latest Flow charts required for the software oriented projects should be illustrated** none

**8. Tasks** **accomplished and executed** (Should include a clear definition of student’s individual or common tasks that are executed during the month and the exact execution time of each task)**:**

Kindly find a copy of our draft plan that was created at the beginning of this semester in this link:

<https://docs.google.com/spreadsheets/d/1PjEKsOsBGfx-PMigb8jOjprw53Lf_AhIT39P4rn-5Ds/edit#gid=0>

|  |  |  |  |
| --- | --- | --- | --- |
| **Task No.** | **Task Holder** | **Task** | **Exact Execution Time** |
| **1** | **Sara -Nada** | **Self study Linux ,bash scripting** | **Until last week of November** |
| **2** | **Sara** | **Front end**  **(chatting activated in app)** | **In progress, started in January** |
| **3** | **Nada** | **Backend** | **Done in January** |
| **-** | **Sara – Nada** | **Self studied Yocto Project tool / Implemented a Hello World using the Yocto project successfully** | **Done in December** |
|  | **Nada** | **Implemented the Infrastructure needed for deploying the web application on the cloud** | **Done in January** |
|  | **Sara** | **The application layer of the Central Raspberry pi**  **(Implemented fetching and sending a message with python part)** | **In progress** |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |

**9. Future** **Time plan of work** :

|  |  |  |  |
| --- | --- | --- | --- |
| **Task No.** | **Task Holder** | **Task Description** | **Expected Time to be executed** |
| **1** | **Nada** | **Deploying the web app on the cloud- synchronizing the databases using storage gateway services** |  |
| **2** | **Sara** | **Customizing the image for QT GUI application** |  |
| **3** | **Nada** | **Customizing the image to use the GSM module** |  |
| **-** | **Nada** | **Building The QT GUI and the application layer for the ambulance car** |  |
|  | **Sara-Nada** | **Connecting the Front end and backend together to finally form the web-app** |  |
| **Note:** |  | **The hospital server part will be implemented if time is sufficient as this is only an extra feature to the project** |  |
| **Note:** |  | **Modification to the systems, and new perspectives are discovered as the implementation proceeds , the given list of remaining task may change** |  |

**10. Bibliography** (List some of the most updated references read and used in the work)**:**

**online resources (Udemey – Youtube - .. )**

**Mastering embedded linux book**

**(Important: Each student should list his/her references with relevance to the tasks listed above)**

**Remarks by Supervisor:**

**Components of Evaluation**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Student Name** | **A**  **(10)** | **B**  **(10)** | **C**  **(20)** | **Total**  **(40)** |
| **-** | **-** | **-** | **-** | **-** |

**Very Important:**

***Full mark in each of the evaluation item is given to exceptional individuals showing ability of providing initiative and innovative solutions***

**A: Knowledge of basic concepts and the ability to apply acquired knowledge while selecting the components or creating the flow charts required for the proposed system.**

**B: Evaluation of the student’s effort in the individual or common tasks, he/she has**

**already executed, taking into consideration the student’s participation of the weekly**

**meeting with the supervisor.**

**C: Evaluation of the report (How far the student succeeds to describe and explain,**

**obviously, each item required from him/her in this report).**

This form should be filled by the students in the same group. It is approved and sent, by the supervisor, to the grad committee chair via email.