

Holocaust Evacuation System using IOT



Saranya C, Harini Pavithra, Karpaga Priyaa K

Abstract— In today’s world, structural manufacture and their characteristics have become complex. Many of the erection has become composite and enlarged. In case of an emergency, an intimation regarding the circumstances and fast evacuation exploitation emergency exits or migrant steering ought to be doable. So we have a tendency to propose an IOT primarily based Holocaust Evacuation system with decentralized monitoring which can sensibly intimate as well as guide rescuers based on the place and moment of any occurrence such as fire-related blackouts, construction collapse, earthquakes, or building aging, gas spillage, air con leakage with the assistant of Fire sensor, vibration sensor, Ac leakage detector, Gas leakage sensor along with our smart phone application to minimize the loss of human life in huge buildings.

Keywords: Erection, Evacuee Guidance, Radio Frequency Identification, Disaster.

I. INTRODUCTION

Disaster depicted as dangerous hazard that happens in an exceedingly short time in reason behind process of an association which ends up within depletion on human lives economic process that overreach the power of simulated association to cope mistreatment of its own resources. It has been delineated as an act that happens suddenly in an exceedingly surprising time.

It emphasizes unfortunate consequences. It additionally outlined as a explosive accident that affects large number of lives. The types of disasters are: Natural disasters, Accidents, Man Made disasters. **Natural Disaster**, an incident that results from environ factors. Floods, earthquakes, hurricanes, tsunami, tornadoes, etc are included in this category.



Figure 1. Natural Disasters

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These disasters are un-expectable, it occurs naturally and suddenly. The folks who lost their house and family are suffering a lot due to food crises and this count is tripled in the last thirty years due to lack of prevention measures by government.

Accident, an unconditional event caused by hazardous materials humans’ carelessness etc. It happens because of massive explosions equipment failure etc. Most of the people are affected by these accidents and some people are lost. Railroad accidents and airplane accidents also come under this category.

Due to the loss of connection between airplanes and air control towers, the airplane crash happens. A proper measure has to be taken to avoid those disasters. Quick evacuation must be done during those situations.



Figure 2. Accidents

Manmade disasters are classified into two categories: Disaster by coercion and Accidental disasters. Disaster by coercion includes bomb blasting, disaster by explosion and so on. Accidental disaster an unexpected event that occurs due to road accidents which occurs to human’s carelessness.



Figure 3. Man Made Disaster

Developing countries are largely harmed when disaster hits, they lose over 95 percent of population in those countries because of severe hazards these countries take initiative to evacuate their people from the risk.



The administration manages the risk using disaster management.

Disaster Management is a comprehensive term furthermore a terrific topic specifically in this present lifetime since the earth is largely exploited by the danger hazards caused by the people through their modern technologies. Evacuation is a immediate response to a hazard that may threaten the life of people it provides the way of escaping people from the house or office or other places which is depleted due to disaster and moving them to a safer place. Disasters being detected using sensors which are connected to the microcontroller.

Tracking Sensors such as smoke detectors, fire detectors, heat detectors, vibration sensors, motion sensors, pressure sensors, proximity sensors, air con leakage detector, gas detector and place detector convert and output the identification of fire and toxic gas data, a Building vibration, gas leakage, electrical signal ac leakage.

Flame detection sensors is a device designed to identify and react to the existence of a flame or spark, enabling for detection of flames. Responses to a detected flame rely on the setup, but may include blasting an alarm, disabling a fuel line (such as a propane or a line of natural gases), and activating a fire suppression system. If the fire range excludes the significance of the limit.

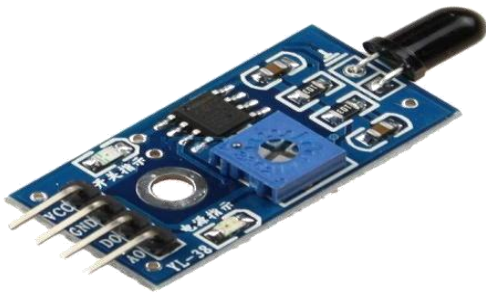


Figure 4. Flame Tracking sensor

Gas detector is wormed for monitoring terrific gas accuracy in nearby regions. This kind of apparatus being utilized to find and may well be concatenated to a bearing system so a technique are automatically close up.



Figure 5. Gas detection sensor

A piezoelectric transducer is buffered by **vibration sensors**. As the transducer is moved from the mechanical neutral axis, bending creates strain and voltages within the piezoelectric element. It is used for detecting gas earthquakes which is a part of disaster.



Figure 6. Vibration Sensor

With the help of these sensors the disaster is detected and notified.

II. EXISTING SYSTEM

In the existing system they have given solution only for fire evacuation. In this system, Disaster warning sound system has been widely used by official agencies to send to the public emergency information during disaster time. In addition to emergency lighting system is available during disaster. The steps involved in fire evacuation system are:

A. General Alert

A warning message distributed among concerned staffs regarding hazard moreover they could be instructed to assemble inside meeting hall. This alert is suitable only for small buildings. High rise buildings require elaborated description concerning the disaster. Therefore, an elaborated alert is distributed among authorities regarding disaster. Level of risk and location might be described within warning message. During this case if any employee stuck within the disaster arena will be radio-controlled and tutored the route to exit from that location.

B. Staff alarm evacuation

Sometimes common announcement may threaten humans about disaster that promote inappropriate evacuation. To avoid this circumstances a silent alarm is made to staffs inclusively.

C. Identifying the location (gas leakage or fire)

Staffs are gathered within meeting hall on reciprocation over alarmed and create a fast arrange for ejection. Initially the disaster region is identified.

D. Evacuating folks

After recognizing fireplace staffs evacuate folks on or close to that location to a safer place by saving their life.

E. Taking some steps to scale back

Staffs within close range of hazard location take acceptable measures to scale back the fireplace or gas discharge using some equipments provided by higher officials. If disaster cleared, following process would be terminated otherwise additional steps has got to be included for rescuing the folks within the premises before the disaster expands or spreads among other places

III. DISADVANTAGES

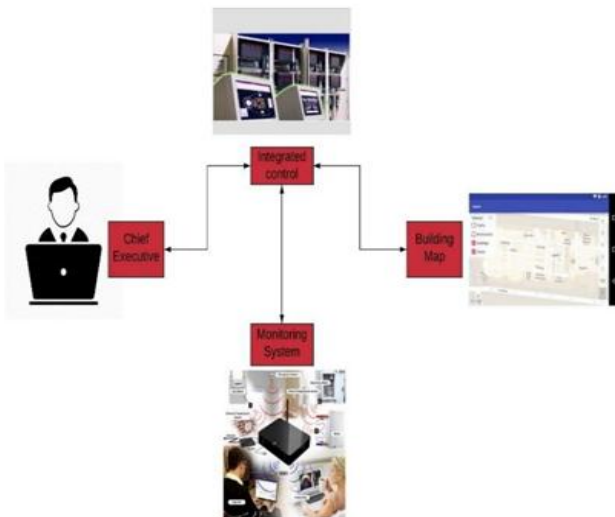
- These measures taken to rescue the folks from the premises take lot of time.

- Due to this lengthy process, the fire may spread to other places before the evacuation.
- There is also a chance of losing some peoples during the disaster due to this slow evacuation system.
- This method is introduced only for fire, other disasters such as an earthquake, gas leakage, ac leakage and so on are not included.
- Uniform emergency guidance such as exit lights is insufficient to guide evacuees throughout a hearth that can produce toxic gases or collapse buildings.

IV. PROPOSED SYSTEM & RESULTS

High-rise buildings complicated and widened. The scheme must therefore enable rapid and secure relocation from building exist during blackouts owing to natural disasters such as flame, construction crash or an explosion, gas leakage and air con leakage when sight is impeded. All evacuees within a complex should be notified and directed away from the stage of the catastrophe to an ideal rescue stage.

A. Architecture diagram



B. Emergency doors and windows opening system

During the time of disaster opening of locked doors and windows may consume time so the integrated control system monitors the PIR sensors status and opens all the doors and windows automatically when needed to provide easy escape

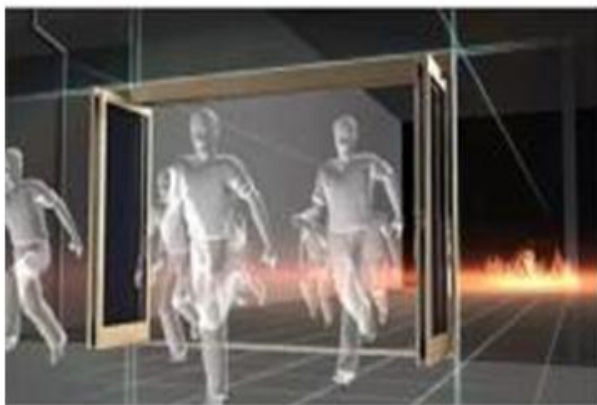


Figure 7. Emergency Exits

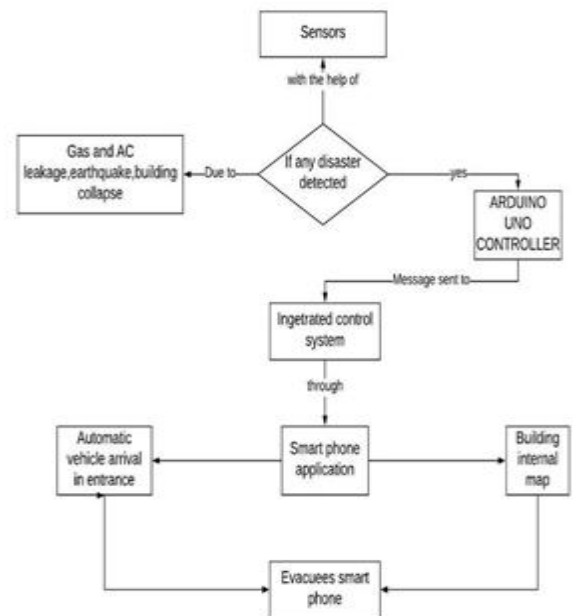
C. System Composition

The intelligent emergency evacuation model is intended to enhance safety and efficiency of evacuate. Human cognitive traits and smart ideas of evacuate machinery concepts were used to develop an effective evacuation system that changes the evacuate instructions according to the incident condition and environment of the fire

An intellectual evacuation route where the processor regulates the guidance light path depending on different sensors and evacuation guide layout.

Depending on situational conditions such as fire, visibility, and the number of evacuees, the emergency evacuation systems model the path to evacuation places through different detours. Guide signal to the optimal evacuation environment are illuminated during emergency through collaboration between the appropriate building disaster prevention system of the relevant building as well as government’s central disaster prevention system; bidirectional information are incorporated when fire or friction is detected.

Consisting of an Ember EM250 chipset, sensor modules, a CDD controller, a communication module, a power module, a CSD controller, an LED display, and buzzers the system environment structure modules are intended.



C. Voice guiding system

The voice guiding system allows helps the evacuates by telling the correct exit direction in each floor to prevent being lost. This system is controlled by the integrated control system module. This system is to provide quick evacuation of evacuees.

D. Emergency lighting system

Cable wiring and batteries power the emergency lights which contain detectors for smoke, flame, and thermal. They are setup as two way signals that interact through the WSN .This provide directional guidance by providing different color lighting at the correct exit direction.

E. Smartphone Application Development

A Smartphone application is created to alarm evacuees of the structure to a flame and permit evacuees who couldn't escape by following the crisis lights and whose perceivability is discouraged by smoke to check their area and the departure way. The application gives the structure plans and departure map important for clearing.

The information allows the approximate location of an evacuee for a rapid rescue based on the data about the time and place of the ignition, direction of the evacuation path, and connection through the app to the integrated control center.

F. Autonomous car arrival

An autonomous vehicle is a vehicle that can detect its places and navigate without human input. Autonomous vehicle can detect surroundings using a techniques such as radar, lidar, GPS, odometer, and computer vision. This car automatically arrives at the entrance using =sensor's data for navigation.

V. ADVANTAGES

- Quick evacuation has been made.
- Folks can be rescued easily using our smart phone application.
- The people can escape from the building quickly through short routes shown on the map.
- Evacuation of people from the building is now made easy through our system.

VI. CONCLUSION

Thus. all sensors connected to Arduino UNO microcontroller detect blackouts in advance. In case of any emergency, information collected from controller and notified through user's mobile phone. The map along with notification distributed over evacuees for quick exit through shortest path of architecture. High-rise architectures complexity has been resolved. Quick safe evacuation system facilitated to exit in minimal accessible time during blackouts because of natural disasters such as flame, building collapse, gas leakage, ac leakage when vision has been impeded. All evacuees within framework alerted and guided to an optimal point remote from point of disaster

REFERENCES

1. Y. W. Kim, Y. S. Lee and D. H. Kim, "Design and Implementation of Autonomous Refuge Guide System Based on Wireless Sensor Network", (2008), pp. 389-392.
2. J. W. S. Liu, F. T. Lin, E. T. H. Chu, J.-L. Zhong proposed a "Intelligent indoor emergency evacuation systems(2016).
3. Fiedrich, F. and B. Van de Walle (Eds.). International Society for Information Systems for Crisis Response and Management, Seattle, Washington.(2008)
4. CherngShing Lin, Ming En Wu proposed "A study of evaluating an evacuation time"(2018).
5. António SimõesRé, Brian Veitch, Scott Newbury "Offshore evacuation system summary report"(1999)

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