

TECHNOLOGY DURING UNPRECEDENTED TIMES



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ABSTRACT

In the midst of the pandemic crisis caused by the new coronavirus, technology can be a key ally to achieve better results, both to reduce its spread and to mitigate and minimize its impacts.

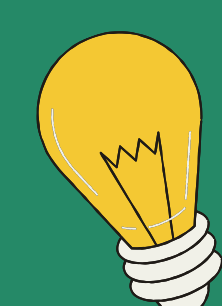
The system developed throughout this research is essentially composed of 4 main parts that will collect the data provided by the patients. The results of the implementation of this low-cost system aimed to reduce the contact time between the healthcare professional and a COVID-19 positive patient. We can then analyze and better comprehend how low-cost technology is an efficient vanguardist and contributes to optimizing human resources with the minimum possible risk.

INTRODUCTION

In 2019, the world faced a silent but deadly killer a new seed of coronavirus currently denominated COVID-19. The COVID-19 virus created a pandemic that compromised the health services of many countries. During the pandemic, Puerto Rico, the United States, and the rest of the world witnessed how health workers, who are our first line of defense against this health crisis, began to contract the virus themselves.

This investigation was motivated by this situation and generated great expectations for the creation of a device that could minimize the tasks and physical contacts that these workers face daily. This research will develop a set of technological instruments used to promote safety and prevent the spread of highly infectious diseases and promote the use of low-cost technology and aid during a health crisis.

OBJECTIVE



To reduce mortality and morbidity while minimizing disease transmission, protect personnel who provide health service, and preserve the functioning of the health system.

METHODOLOGY

Step 1: Designing The system's GUI will be composed of (1) Entry Form (2) Appointment Form (3) Informative Session and (4) Questions / Comments.

Step 2: Development Acquisition of the Hardware (a) Raspberry Pi Touchscreen Monitor, (b) Raspberry Pi 4 Model, and (c) the stand.

Step 3: Programming The framework selected for the project was Kivy which uses the Python programming language. During group meetings, other technologies like Electron using HTML, CSS, and JavaScript were taken into consideration but ultimately Kivy was chosen because of its simplicity and because Python is a comfortable language to work with.

Step 4: Implementation After several meetings with different hospitals, Dr. Sepúlveda allowed us to implement the prototype in the Humacao CDT as part of his initiative to try to minimize the effects that COVID-19 could have on his clinic. During my time there, I was able to collect both the data of the patients and the recommendations of the health personnel.

DATA

The data presented here was collected from the Humacao CDT emergency room in the "tent" area where suspected cases of COVID-19 were treated.

- 30% of the total number of people who visited it are directly related to the virus.
- 40% of the people who were present have active symptoms such as cough and sore throat.
- The nurse's contact time in the triage and registration area was 15 to 20 minutes, and the device was able to reduce it to 5 minutes, consequently reducing by approximately 70% the high-risk contact with patients who present symptoms.

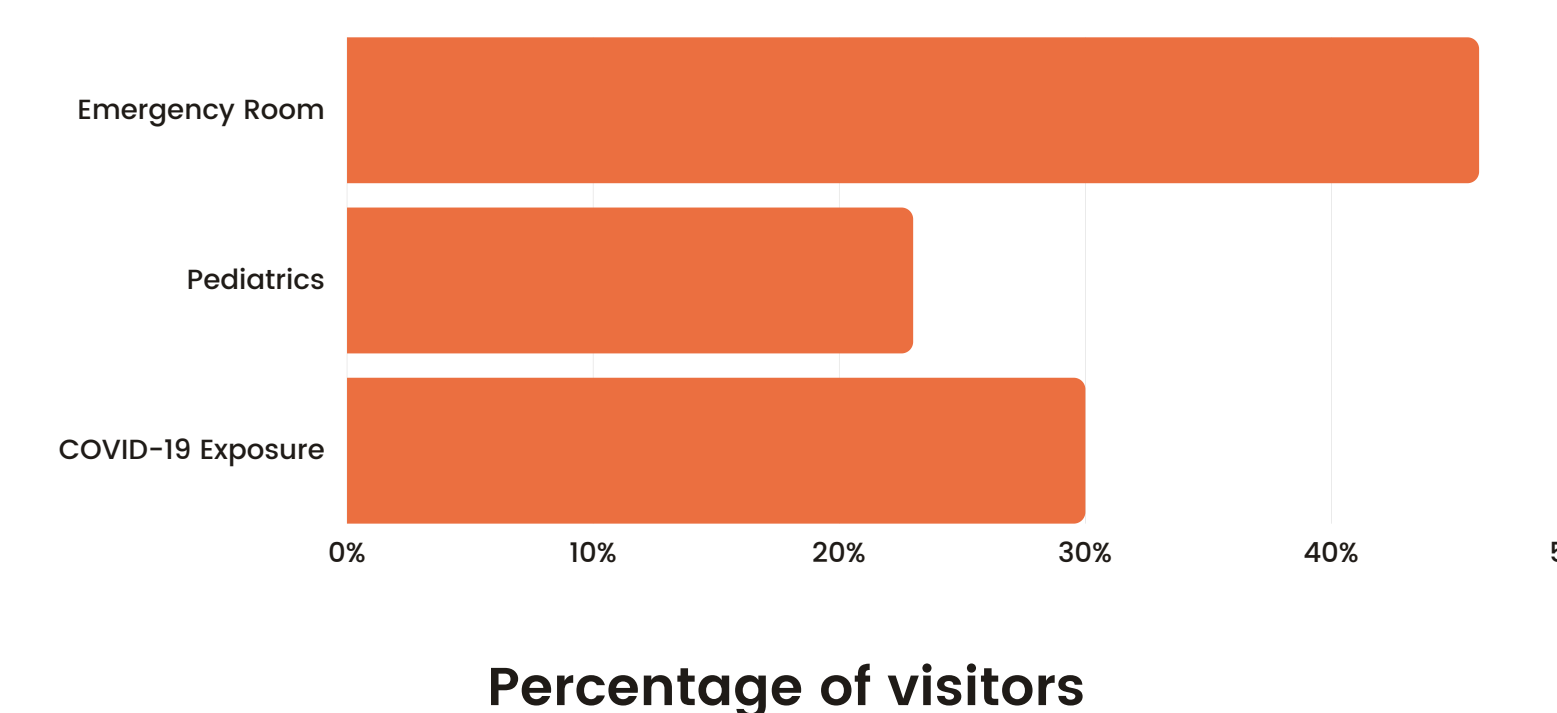
ANALYSIS AND RESULTS

These graphs show the percent of patients impacted in the Humacao CDT. In addition, they also show the most outstanding active symptoms of the patients who visit the emergency room with suspicion of COVID-19.

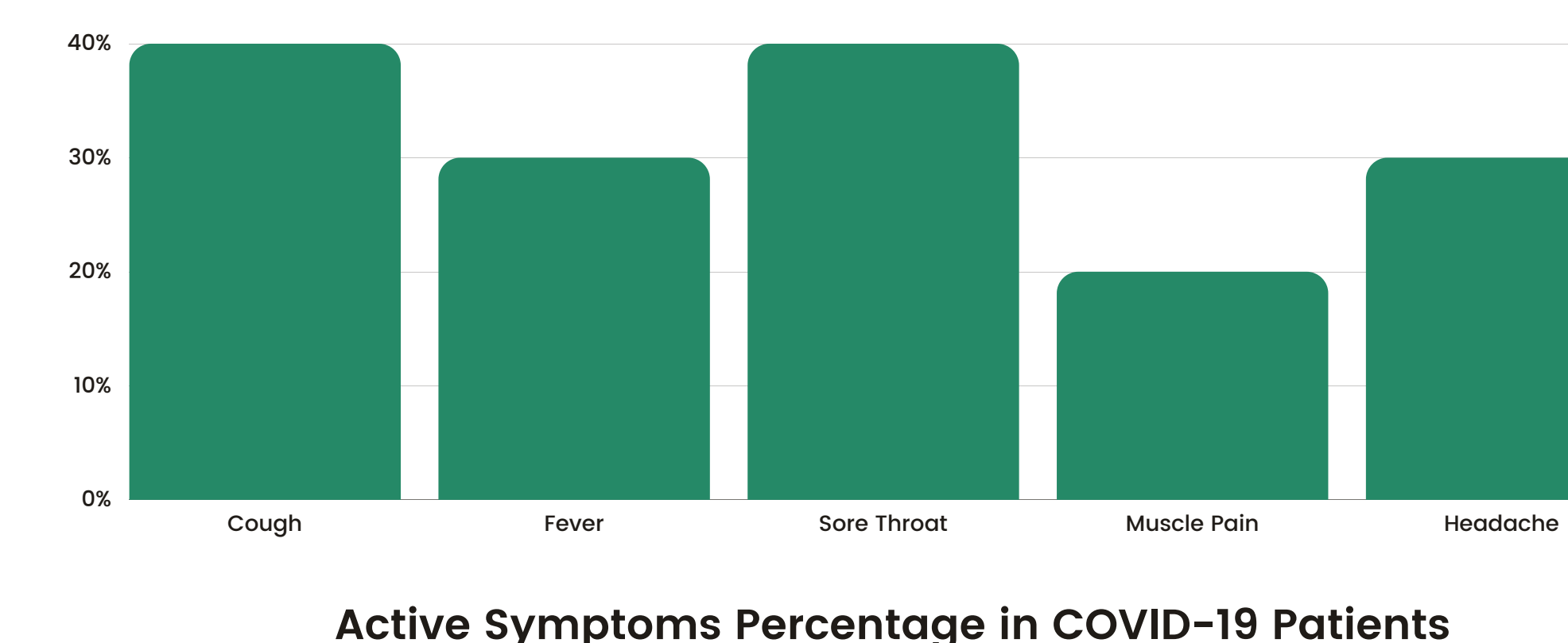
The device turned out to be effective and of great help for the impacted CDT since in the place all the resources they had for data collection were manual, thus increasing the risk of exposure of health personnel and complicating the tracking and monitoring of cases. reviewed.



Prototype



Implementation Team



CONCLUSION

Technological advances in medicine have been very significant for human life. Currently, most medical solutions have a technology background. This research demonstrated how low-cost technology can be an effective tool in the prevention of COVID-19 since it managed to minimize the contact between the nurse, doctor, and the patients who presented active symptoms. There is always room for improvement but overall the objective established by this research was achieved. Among the public, the level of satisfaction reached 95% acceptance, therefore creating a positive reaction toward new methods that could potentially aid in the enhancement of healthcare systems in the future. Continuing with this project could potentially help in the development of new methods that can help improve quality of life and alleviate the workload of healthcare professionals.

FUTURE WORK

There are a couple of things that remain a priority to aid in the better performance of the device presented here, (1) implement the monitor on a flexible base that can travel around the hospital autonomously or via remote control and (2) in the programming, although Kivy was chosen to execute this project, Electron could be strongly considered in a future implementation because Kivy is good for quick and simple solutions, but it is not robust enough to allow for easy scalability.

ACKNOWLEDGEMENTS

My thanks to the following contributors the Computer Engineering students Hector A. Medina and Anthony Y. Encarnacion as well as the medical staff who made this research possible Dr. Eduardo Sepulveda, nurse Farah Vega and Dr. Rafael Encarnacion.

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