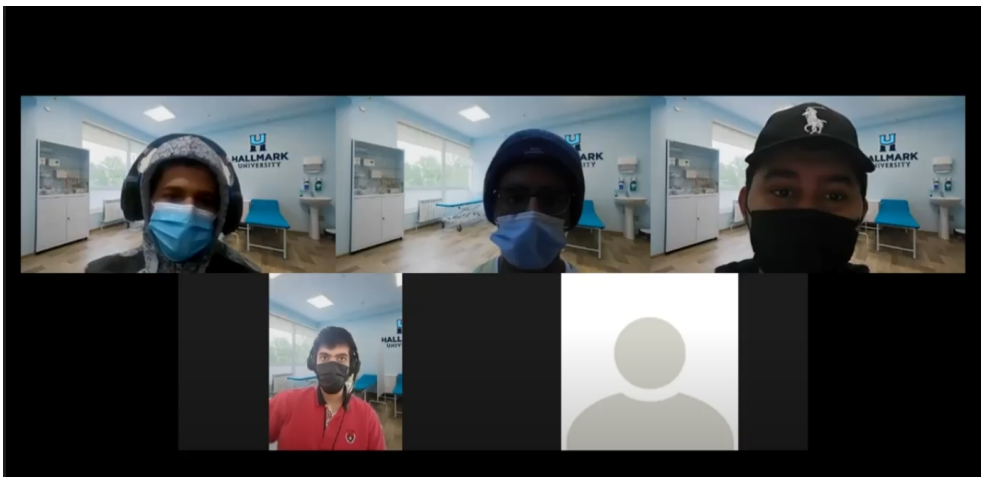
Introduction:

Wireless doorbell systems, which use radio technology to signal doorbells and answer doors remotely, are common in modern structures. Despite the fact that these doorbells are far more handy than wired versions, they may not always meet the needs of modern households for the following three reasons. To begin with, standard doorbell machines are often positioned in a fixed location (often near the door), so if an occupant wants to answer the call, he or she must first walk to the door. Second, if the person wants to see who is outside, he or she must go to the door. Third, while the occupant is not at home, there is no means for him or her to answer or welcome visitors, let alone keep track of them. As a result, we've decided on IoT, especially smart doorbells. This is because, in addition to keeping homeowners and their things safe from intruders, a remote home security system offers a slew of other benefits. The Internet of Things (IoT) is a network of networked objects (physical devices, autos, home appliances, and so on) that exchange data through electronics, sensors, and other ways. Why should you buy our product instead of all the other doorbells in the market? This is because our product is cheaper than others because it uses cheap materials to create but with high quality still. Secondly, our doorbell has an upgraded system which detects if someone is trying to open the door with brute force and locks the door while calling the police. Otherwise if the person has access it will let him enter the house, but if he has no access the door will not be opened and the owner will be notified.

Detail steps and descriptions

Someone might ask about how we got the idea for the smart doorbell. Why did we specifically choose this topic? Firstly start with our friend Mohammed who uses this Technology in his house. He talked about how it has a lot of advantages and benefits for a lot of people and told us about it. So here me and my group members were interested in this idea to talk about, so here the group starts to search in Google and start searching for documents and read about it until here we saw that the smart doorbell is the best topic we can talk about so after we agree about this idea we start in our project. We started working by reading some articles until we had this good idea.



Description on problems

Today we will talk about the problems and the issues that our team faced while working on our project. So firstly when we talk about a project or teamwork you understand from the teamwork, a group of people they come with each other to do a specific job. So here we talk about teamwork so fairly. The first problem that we face is that every one of us is in a different country. So this makes an issue that we can't meet face to face and from the previous months, We Understood that Studying online and doing projects online is very tiring. So how did our group Deal with this issue? We used apps like zoom and discord so we could meet each other and open the camera like we were sitting face to face. This was the first issue, the second issue that we faced about some tasks that we should do in our project. We didn't know or we didn't understand it because we didn't take it before. So in the second issue my friend Mohammed tried to solve it by learning from YouTube tutorials, So he can understand how we can solve this problem. The third issue It's also about the time, everyone has a different time in his country, there is more than five or four hours between Malaysia, Kuwait and Saudi Arabia. So it was difficult to make a meeting while everyone was free. These were the biggest issues we've faced.

Flow chart:

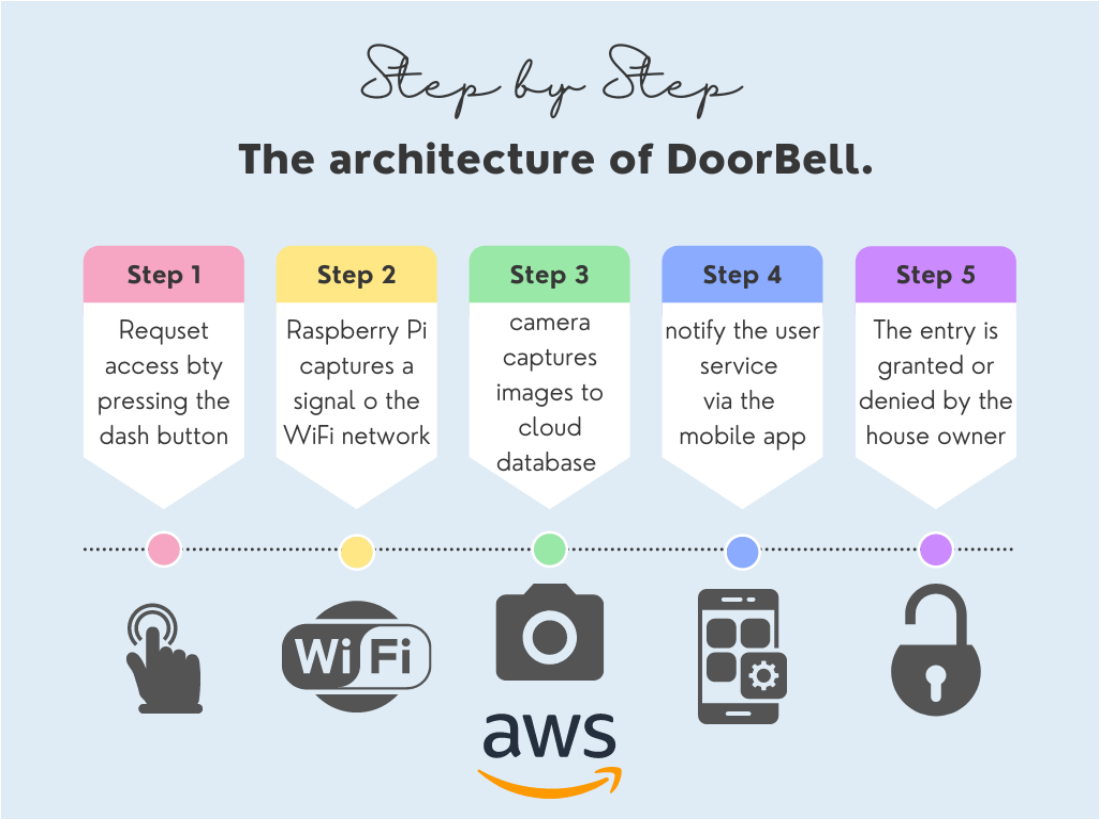
The Doorbell system allows the homeowner to view a visitor's photos and verify their identification remotely. Furthermore, when linked to the Internet, it allows the house owner to accept or reject a request from anywhere. A dash button (as the doorbell), a WiFi router, a computing device (e.g., a Raspberry Pi), a webcam, a buzzer, cloud computing service (e.g., Amazon Web Service), a smartphone, and the Internet make up the Doorbell system (as illustrated in Flowchart). The following is a description of the workflow:
1) A guest requests access to the house by pressing the dash button.

2) The Raspberry Pi captures a signal from the Dash button to the WiFi network. The following operations are triggered as a result of it: activate the camera and take a photo of the guest who hit the button; activate the buzzer for the alarm sound so that the owner is aware of the presence if inside the house; and upload the image taken together with the timestamp to the cloud.

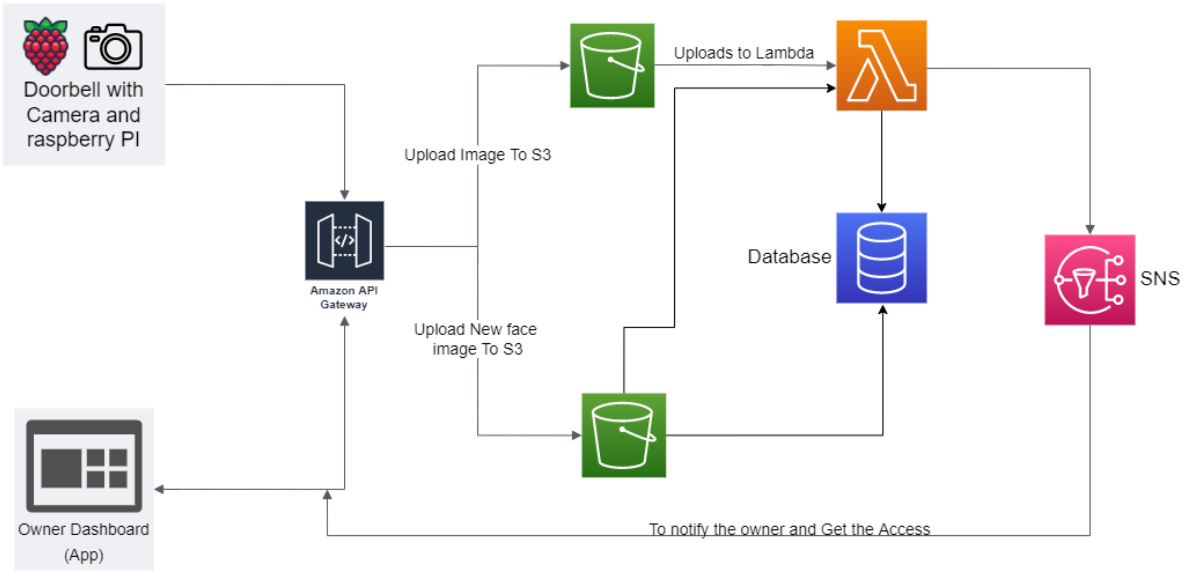
3) The camera captures and processes images of the visitor before sending them to a cloud database service (we use Amazon Web Services).

4) The user is notified by the service via the mobile app.

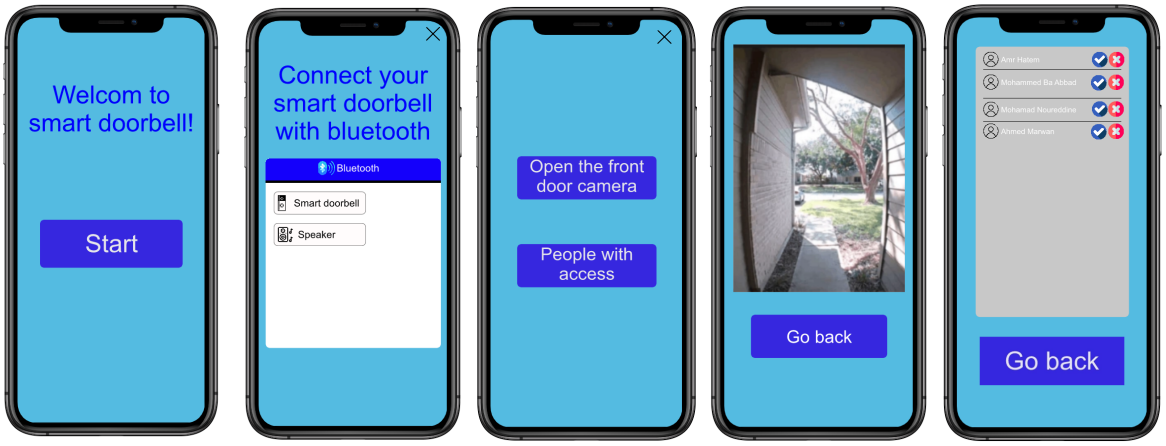
5) The visitor's entry is granted or denied by the house owner. The server, which also sends the message to the Raspberry Pi, updates the decision. The door opens automatically using a servo-motor if the visitor is granted admission by the house owner. No action will be done if access is refused, and the guest's request for admittance will be denied.



AWS Architecture Design for the doorbell:



Example of our Low-Fidelity Prototype:



To access our Prototype click [Here](#).

Reflections

Mohammed Hussein's Reflection:

Firstly, we have learned so many things by doing this project only. In addition, many things that we have achieved and learned have motivated us to complete this project but I'm going to mention some of them. Which are, for example, we learned how to use and build applications in an excellent way, we also learned how to establish good scientific research and surely we learned how to make Low-fidelity Prototypes for any project that we need to develop, as well as the significant benefit from them. Moreover, We have learned professionally how to use the AWS and benefit from it in our practical and scientific lives, and take the advantages of all Amazon Web Services services and apply them in real life.

However, AWS is a very broad and deep field. Although we've learned from it superficially, we've benefited substantially a lot from it and found it a vital requirement in the technology of the modern world. Subsequently, although we've faced difficulties in learning and creating Low-fidelity Prototypes, we've learned essential things to help and motivate us in our journey in computer science and we expect that it will benefit greatly in the future.
Secondly, even though that we've found the project is something interesting, we've been facing many problems and difficulties, but we didn't stop there, as we tried very hard to to find many solutions, to illustrate we have faced a problem with Invision studio app but we didn't surrender, hence, we watched many and many tutorials as well as we have tried to know all the components that the program has.
Thirdly, after completing this project I have got some thoughts and ideas that I might follow them in the future, for instance, designing AWS architecture is something very interesting and complicated at the same time, however, it is very crucial thing to learn so that we can build great projects, as well as successful application ideas using the professional software applications (e.g. Adobe XD). From my perspective I would say that in the future I will go deeper and deeper in learning this field, specifically after discovering the way it works, and how interesting and motivating it is.
Finally, as I see I have to improve my social skills firstly, this is because social skills and teamworking are the most critical parts on doing any project or any complex work, in addition, it will substantially increase the productivity and creativity and reducing the number of mistakes as well as it will save hundreds of minutes and reduce the cost. Moreover, I have to be a hard working person. From my perspective the computer science field, in general, isn't that easy, we have to work hard and organize every minute of our day very carefully, and I think we have to love it so we can put more effort while learning it. In conclusion, as we all know, technology is improving every single minute, so we have to be up-to-date with the new inventions and technologies.

Mohamad Noureddine's Reflection:

This project was very entertaining to make and to discuss ideas with my group,this project helped a lot to learn more about AWS and how smart doorbells work and also strengthen my relationship with the other group members, the biggest difficulty was getting ideas on the prototype UI and functions, but with help from my team i managed to make the prototype so much better and complete, after completing this project i felt more interested in the IoT technologies and decided to learn more about it when i have free time, i feel like i need to learn how to organize my time a little bit more so that i could work under a lot of pressure.

Amr Hatem's Reflection:

Ok, here I will talk about my reflection on this project. Firstly, when I talk about what I learned and how I get the motivation to complete this project or learn a lot of skills like how to manage my time, how if I faced any issues to deal with it. I have a lot of issues like you know we talk about that. Me and my friends are all in different places so we should meet online and also we had almost stress from our college in an educational and personal way. So all of these issues we face already and learn how to deal with it when I talk about my direction

about completing this project. Here I know that I have a lot of benefits I already learned, like I know more about my friend's skills and learn from them. Learn about the things that I maybe didn't know about it like a smart doorbell. All of this technology will help humans to improve Their civilizations so at last if I talk about what are the most important skills that I will improve to complete in this field that I should?

- how to deal with stress.
- how I can improve my educated skills
- how to manage your time how to think out of the box

Ahmed Marwan's Reflection:

After implementing the project, I realized that the system of the smart doorbells is not as complex as I thought, and I also got a lot of information and experiences about AWS and working with the team.
To enhance the number of smart doorbells available, a smart doorbell system that combines the Amazon Dash button with current gadgets in modern houses to create a cost-effective option for users. The smart doorbell system performs similarly to its marketed equivalents but at a significantly lesser cost. It costs less than 40 dollars, against 199 dollars for a single smart doorbell on the market. The doorbell takes a distributed method to defect detection and diagnosis, allowing it to be done quickly. By doing so, we help to extend the benefits of smart doorbells to home users and contribute to making the world a wiser and better place through technology.
My goal is to have the full knowledge of AWS and working with the team.

Thank you very Much.

This Project has been done by:
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