

Research Article

Smart Toilet Monitor System

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Abstract: Solving the problem of smelly and dirty toilets in school by monitoring usage, smell, and turning ON an exhaust fan and triggering a push notification to a cell phone for cleaning.

Keywords: IOT; Internet Of Things; Toilet



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1. INTRODUCTION

What comes to mind when you think about school? Dirty school toilets. The School Toilet Report finds that 9 in 10 children are impacted physically and emotionally by the poor state of school toilets.



Figure 1: Statistics

2. METHOD & MATERIAL

Solving the problem of smelly and dirty toilets in school by monitoring usage, smell, and turning ON an exhaust fan and triggering a push notification to a cell phone for cleaning. Our innovation uses an infrared sensor to detect and count the number of students using the toilet. We also added an air quality sensor to measure how smelly or bet the air quality is in the toilets. We installed a

huge fan to blow and exhaust air out of the toilet. We use the smart IOT Raspberry Pi to send a push notification to a cell phone application that broadcasts a request for cleaning.

3. FINDINGS

1. An international study from Domestos shows that nearly 1 in 5 children experience physical discomfort or inability to concentrate from 'holding it in' and not going to the toilet at school because the facilities are dirty or unusable.
2. More than 1 in 10 children deliberately skip food or drink to avoid using a school toilet.
3. The issue is felt across the world as study delivers findings that are matched across India, UK, Poland, and South Africa.

4. DISCUSSION

The contribution and impact of this innovation is to provide students with relief from stress with the availability of a clean toilet. The smart monitoring toilet system stops the spread of diseases in the toilet. Students can keep hydrated because they can now use a clean toilet. It provides a healthy living environment for all students to enjoy. The benefits of a real time monitoring system that uses the IOT to remedy the situation at hand. The commercialization potential of STMS is low cost, which is under 90 ringgit per toilet. It provides high value user experience and has zero maintenance costs. The build of materials and components are easily available. The source code application is open source. There are 10,083 schools in Malaysia that will benefit from this innovation.

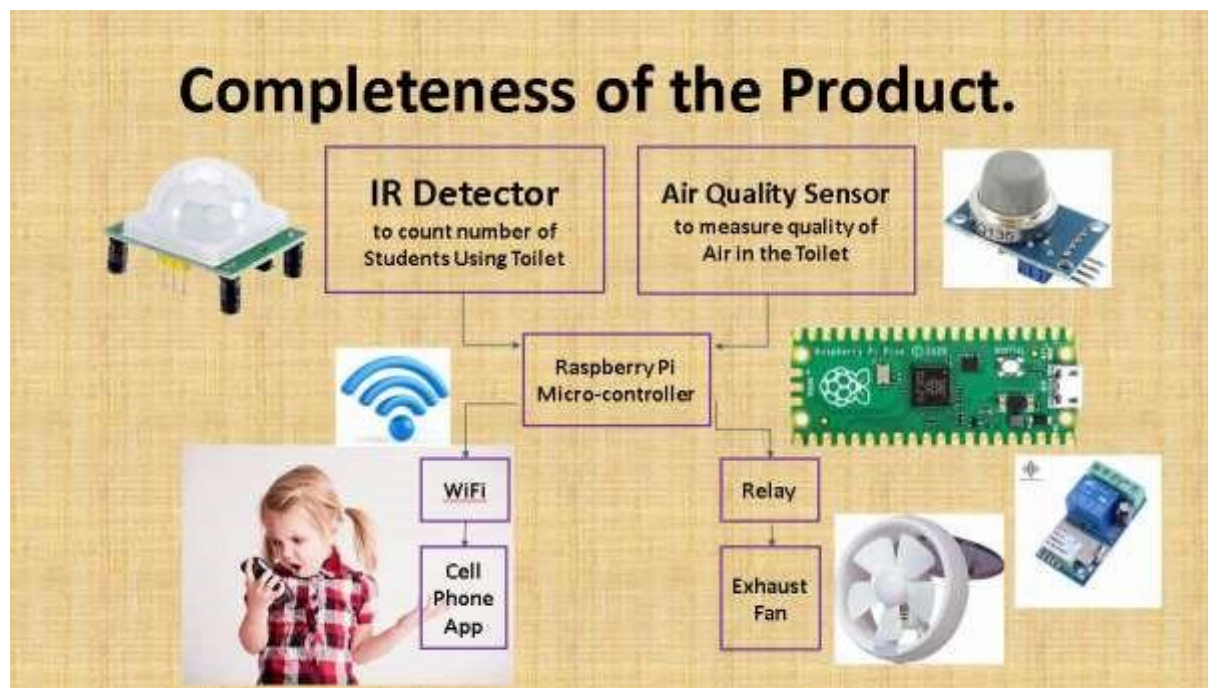


Figure 2. Block Diagram of STMS (Smart Toilet Monitoring System)

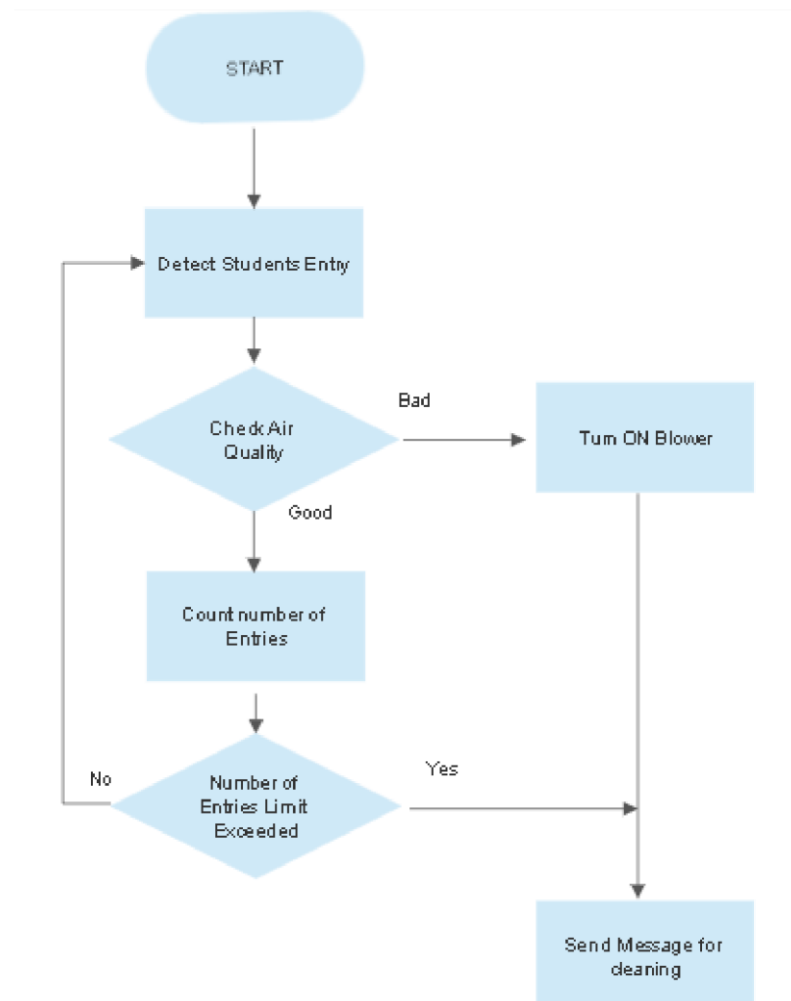


Figure 3. Flow Chart of STMS (Smart Toilet Monitoring System)



Figure 4. Smart Toilet Monitoring System

5. CONCLUSION

This innovation uses the Internet of Things coupled with cell phone notification. This innovation is unique because it uses an air quality sensor to measure how bad the air is in the toilets, then it uses a big fan to exhaust air out of the toilet. The monitoring of the toilet is done 24 hours, seven days a week. In conclusion the STMS provides timely and effective notification for toilet maintenance.

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References

Dirty school toilets fail our kids Published: 19 November 2021 (<https://www.unilever.com/news/press-andmedia/press-releases/2021/dirty-school-toilets-fail-our-kids/>)