COST-EFFECTIVE MONITORING SYSTEM FOR BIOMEDICAL AND CLEANROOM FACILITIES

By

OMAR ABDULAZIZ HUSSAIN	**1945955**
IBRAHIM MOHAMMED AHMED	**1945968**
ABDULLAH ABU BAKR ALKAF	**1935764**

TEAM NO.: 08 WINTER-2022 INTAKE

Project Advisor

DR. NEBRAS SOBAHI

Project Customer

DR. NEBRAS SOBAHI

DEPARTMENT OF ELECTRICAL AND COMPUTER ENGINEERING
FACULTY OF ENGINEERING
KING ABDULAZIZ UNIVERSITY
JEDDAH – SAUDI ARABIA

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ABSTRACT

There are some critical processes occurring inside semiconductor factories and hospitals that need to be monitored carefully. Here comes the role of the cleanroom, which is a closed and controlled room that has specific conditions and environment. Unfortunately, the available monitoring systems for cleanrooms in the market are very expensive and it is difficult to afford it. After doing a lot of research and meetings we found that the main problem is that the available monitoring systems are mostly expensive and not suitable for all kinds of cleanrooms and from that we chose our higher objectives which are designing an expandable and cost- effective monitoring system for biomedical and cleanroom facilities.

In this report we created three alternatives to solve our defined problem. For the first alternative we used a smart monitoring system using IoT (Internet of things), for the second alternative we connected and wired all components together and used multiplexers to group all similar sensors. In addition, for the last alternative, we used subsystems to monitor the cleanroom where each subsystem was monitoring at least three things which are temperature, humidity, and pressure. After doing the evaluations and comparisons between these three alternatives, we found out that the second alternative is the best one then we chose it to be our baseline design. After that, to mature our baseline design we did a lot of research and after that we added some sensors to the baseline design which are particle sensor, motion sensor, and some gases sensors.

Index Terms *— Monitoring system, cleanroom, particle sensor, Temperature and humidity and pressure sensors, Decision-making Analysis*