

BE Project

Computer Engineering Department

Project ID: BUKC-CE-2019-01

April 2020



Bahria University
Discovering Knowledge

KEEPIN'IT FRESH

“Know Your Food a Little Bit Better”

Arjumand Saeed Shaikh

Isha Saghir

Saba Nawaz

Department of Computer Engineering

Bahria University, Karachi Campus

Submission Performa

Name (1) Arjumand Saeed Shaikh
(2) Isha Saghir
(3) Saba Nawaz

Address (1) House No. C-109, Block 13/D, Gulshan-e-Iqbal, Karachi
(2) House No. 521, Block 46, Hanif SRE, Karsaz, Karachi.
(3) House No. B-980, Street 7, Mujahid Colony Dalmia, Karachi.

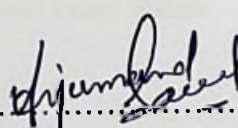
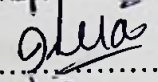
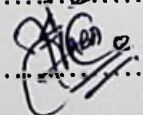
Keep In' It Fresh

Engr. Nabiha Faisal

This report is submitted as required for the Project in accordance with the rules laid down by the Bahria University as part of the requirements for the award of the degree of Bachelor of Engineering. I declare that the work presented in this report is my own except where due reference or acknowledgement is given to the work of others.

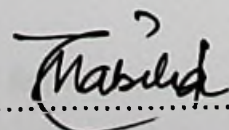
Signatures of students

Date

(1).....  20-07-2020
(2).....  20-07-2020
(3).....  20-07-2020

Signature of Supervisor

Date

.....  20-07-2020

Acknowledgments

Firstly, thanks to Almighty Allah (S.W.T) for providing our team the strength and capabilities to understand the roots of KeepIn'It Fresh and giving us the ability to complete this project.

I wish to articulate my heartfelt thankfulness to my supervisor, Engr. Nabiha Faisal, for her passion, persistence, perceptive remarks, valuable knowledge, pragmatic guidance that have helped us greatly at all times in our project from the beginning to the end. We would like to thank our PMO for being super helpful throughout the course of the project. Without the help and confidence and trust of our teachers, parents and family support it was not possible to achieve this milestone.

Abstract

Food plays an important role in our lives and with the beginning of globalization, the need to create consumer products for effective usage has become a necessity. This project uses electrochemical ammonia gas sensor along with a temperature and humidity sensor. The conclusive values help us determine the condition of the food.

Basically, the idea of KeepIn'It Fresh is to give real time results to the user and display the quality of their food. The idea is to provide the users with a built-in device and an Android Application where they can check their own food quality results. Because of the real time results provide an insight of the food and whether it is good for consumption or not. Major purpose of this entire project is to check if the food is healthy with no harmful gases in it whether the meat is in an edible condition or rotten. It will be used for reducing the causes of food poisoning. This project will be giving better health condition.

In each chapter we will be covering details starting from the background of project, covering its literature review, highlighting hardware and software requirements and the requirements that is needed to design the system. Furthermore it covers the implementation of the system. Highlights the implementation factors in detail and its testing. Lastly, it gives us the results and future work of KeepIn'It Fresh.

KeepIn'It Fresh proved to be a test for our team in utilizing knowledge by reading into different books and different research papers. It helps us to utilize the all the academics and realistic facts of most of the course we have studied throughout our bachelors.

Table of Contents

1. INTRODUCTION.....	1
1.1 BACKGROUND.....	1
1.2 PURPOSE OF THIS PROJECT	1
1.3 PROBLEM STATEMENT	2
1.4 FUNCTIONS AND SUBDIVISIONS.....	2
1.5 AIMS AND OBJECTIVES	3
1.6 PURPOSE AND SCOPE.....	4
1.7 PROPOSED METHOD	4
1.8 REPORT STRUCTURE	5
2. BACKGROUND AND LITERATURE REVIEW	7
2.1 INTRODUCTION.....	7
2.2 LITERATURE BACKGROUND OF AMMONIA	2
2.3 EXISTING SYSTEM.....	8
2.3.1 Ammonia Selective Electrode.....	8
2.3.2 Radio Frequency Identification Tag	8
2.4 PROBLEMS IN THE EXISTING SYSTEM	9
2.4.1 Ammonia Selective Electrode.....	9
2.4.2 Radio Frequency Identification Tag	9
2.5 RELATED WORK.....	10
3. SYSTEM ANALYSIS.....	11
3.1 INTRODUCTION.....	11
3.2 HARDWARE REQUIREMENTS	11
3.2.1 Microcontroller	12
3.2.2 Temperature and Humidity Sensor	14
3.2.3 Ammonia Sensor.....	15
3.2.4 LED Display	17
3.2.5 Battery.....	17

3.3	SOFTWARE REQUIRMENTS	18
3.4	WORK ANALYSIS	18
3.4.1	Hardware Work Analysis.....	18
3.4.2	Hardware Work Flow	19
3.4.3	Software Work Analysis.....	21
3.4.4	Software Work Flow.....	22
3.4.5	Integrated System Work Analysis	23
3.4.6	Integrated Work Flow of the System.....	24
3.5	DATA ANALYSIS	25
3.5.1	Data Flow.....	25
4.	SYSTEM DESIGN.....	26
4.1	INTRODUCTION.....	26
4.2	SYSTEM REQUIRMENTS.....	26
4.2.1	Resource Requirements	27
4.2.2	Data Requirements.....	27
4.2.3	Non-Functional Requirements	28
4.2.4	Circuitry And Design.....	30
4.3	DESIGN CONSTRAINTS.....	31
4.3.1	Hardware and Software Environment.....	31
4.3.2	End-user Characteristics	32
4.4	ARCHITECTURAL STRATEGY.....	32
4.4.1	Algorithm to be used.....	33
4.4.2	Architectural Design	34
4.4.3	Logical View.....	34
4.4.4	Hardware Architecture.....	35
4.4.5	Software Architecture	36
4.5	USE CASE	38
4.6	DATABASE DESIGN	39
4.7	DATA CONVERSIONS	40
4.8	APPLICATION PROGRAM INTERFACE	40
4.9	PERFORMANCE DESIGN	41
4.9.1	Gantt Chart.....	41

4.9.2	Development Method.....	43
4.9.3	Quality Management.....	44
5.	IMPLEMENTATION	45
5.1	INTRODUCTION.....	45
5.2	HARDWARE IMPLEMENTATION	45
5.3	SOFTWARE IMPLEMENTATION.....	49
5.4	APPLICATION PHASE	52
6.	TESTING.....	53
6.1	INTRODUCTION.....	53
6.2	FUNCTIONAL TESTING.....	53
6.2.1	Task/Risk Issues.....	54
6.2.2	Items to be Tested	54
6.2.3	Test Approaches.....	55
6.2.4	Test Regulation / Mandate Criteria.....	55
6.2.5	Test Pass / Fail Criteria	55
6.2.6	Test Entry / Exit Criteria.....	56
6.2.7	Test Deliverables	56
6.2.8	Test Resumption / Suspension Criteria.....	56
6.3	PERFORMANCE TESTING.....	57
6.3.1	Load Testing	57
6.3.2	Stress Testing	59
6.4	SYSTEM TESTING.....	62
6.4.1	Test Risk/Issues	62
6.4.2	Items to be Tested	62
6.4.3	Test Approaches.....	63
6.4.4	Test Regulation / Mandate Criteria.....	64
6.4.5	Test Pass / Fail Criteria	65
6.4.6	Deliverables	65
6.4.7	Test Environmental/Staffing/Training Needs	66

7. RESULTS AND DISCUSSION.....67

 7.1 INTRODUCTION.....67

8. CONCLUSIONS AND FUTURE WORK.....72

 8.1 CONCLUSION72

 8.2 FUTURE WORK72

REFERENCES.....73

APPENDICES.....74