

BE Project
CE Department
Project ID: BUKC-CE-2020-03
June 2021



Bahria University
Discovering Knowledge

FINAL YEAR PROJECT REPORT

AUTOMATED DELIVERY SYSTEM

SHAHERYAR QAZI
FIZZA ASGHAR
ABEERA IZHAR

Department of Computer Engineering

Bahria University, Karachi Campus

Submission Performa

Name (1) Shaheryar Qazi
(2) Fizza Asghar
(3) Abeera Izhar

Address (1) A-85 S1 Block-3 Gulshan-e-Iqbal karachi
(2) CPO 17 house number 204 Hanife S.R.E Karsaz Karachi
(3) R/396 Sector 14B Shadman No 02 North Karachi

Automated Delivery System

Dr. Shoaib Mughal

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. We declare that the work presented in this report is our own except where due reference or acknowledgement is given to the work of others.

Signatures of students

Date

(1)..... 01-07-2021
(2)..... 01-07-2021
(3)..... 01-07-2021

Signature of Supervisor

Date

..... 01-07-2021



Intellectual Property Right Declaration

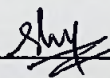
This is to declare that the work done under the supervision of ___Dr. Shoaib Mughal___ having title “_Automated Delivery System_” carried out in partial fulfillment of the requirements of Bachelors of Engineering in Computer Engineering, is the sole property of Bahria University and is protected under the Intellectual Property right laws and conventions. Bahria University asserts legal and beneficial ownership rights over all Intellectual Property developed as a result of support either directly from or channeled through Bahria University, or created at the request or direction of Bahria University, or developed as a result of utilization of Bahria University Resources including copyright in any material. It can only be considered/ used for purposes like extension for further enhancement, product development, adoption for commercial/organizational usage, etc., with the permission of the university and in adherence to its policies.

The above statements apply to all students and faculty members.

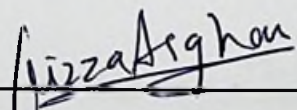
Date: 01-07-2021

Author(s):

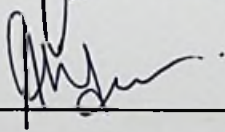
Name: Shaheryar Qazi

Signature: _____ 

Name: Fizza Asghar

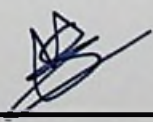
Signature: _____ 

Name: Abeera Izhar

Signature: _____ 

Supervisor(s):

Name: Dr. Shoaib Mughal

Signature: _____ 



Anti-Plagiarism Declaration

This is to declare that the above publication produced under the supervision of Dr. Shoaib Mughal having title "Automated Delivery System" is the sole contribution of the author(s) and no part hereof has been reproduced illegally (cut and paste) which can be considered as Plagiarism. All referenced parts have been used to argue the idea and have been cited properly. I/We will be responsible and liable for any consequence if violation of this declaration is proven.

Date: 01-07-2021

Author(s):

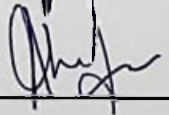
Name: Shaheryar Qazi

Signature: 

Name: Fizza Asghar

Signature: 

Name: Abeera Izhar

Signature: 

Acknowledgments

We would like to thank everybody who assisted us in completing this project successfully. Dr. Shoaib Mughal, our research supervisor, deserves special thanks for his invaluable advice, direction, and persistent forbearance throughout qualitative research.

We would also like to thank and express our sincere gratitude to our beloved parents and friends who have assisted and encouraged us.

Abstract

The designing and manufacture of medicine and food delivery robots for health care sector is presented in this report. Automation has become a domain that had already propagated its tendrils across absolutely every infrastructure industry and has now advanced further into sector of healthcare. The focus of this research is to design a robot which could supply the material in place of a nurse in the hospitals. The Automated Delivery System uses a line following algorithm to measure the way, which includes two infrared proximity sensors to sense the path and RFID cards to recognize the patient's room number. Also, it uses an ultrasonic sensor to recognize barricaded halls as well as an audio playback equipment to communicate to patients and medical professionals about the medication.

This indicates that it provides a clear and reliable method while minimizing production cost. The Arduino Mega 2560 had been used to build this robot, and the Arduino IDE was utilized to program it. Doctors and medical workers in the hospital will be able to communicate with one another via an app that will be connected directly to the Automated Delivery Robot.

Table of Contents

CHAPTER 1	1
1. INTRODUCTION	1
1.1 PURPOSE OF THIS PROJECT	2
1.2 COMPLEX ENGINEERING PROBLEM STATEMENT	2
1.3 OBJECTIVES OF THE PROJECT	2
1.4 SCOPE OF THE PROJECT	3
1.5 PURPOSE OF THE DOCUMENT	3
1.6 MODULES IN THE PROJECT	4
1.7 GENERAL OVERVIEW AND DESIGN GUIDELINES/APPROACH	4
.....	5
.....	5
CHAPTER 2	6
2.1 EXISTING SYSTEMS	6
2.2 RELATED WORK	7
CHAPTER 3	8
3. SYSTEM ANALYSIS	8
3.1 WORK ANALYSIS	8
3.1.1 Work Flow Diagram	9
3.1.2 Work Breakdown Structure	10
3.2 DATA ANALYSIS:	11
3.2.1 Data Flow Diagram	11
3.2.2 System Requirements	12
3.2.3 Clients, Customer and Users	12
3.2.4 Resource Requirements	12
3.2.5 Data Requirements	13
3.2.6 Non-Functional Requirements	13
3.2.7 Usability Requirements	13
3.2.8 Reliability Requirements	14
3.2.9 Security Requirements	14
3.2.10 Performance Requirement	14
3.2.11 Maintainability Requirements	14
3.3 PROPOSED SOLUTION	14
CHAPTER 4	16
4. SYSTEM DESIGN	16
4.1.1 Hardware and Software Environment	16
4.1.2 End-user Characteristics	17
4.2 ARCHITECTURAL STRATEGIES	17

4.2.1 <i>Algorithm to be used</i>	17
4.2.2 <i>Project Management Strategies</i>	18
4.2.3 <i>Gantt Chart</i>	18
4.2.4 <i>Development Method</i>	19
4.3 USE-CASES	20
4.4 DATABASE DESIGN	21
4.5 DATA CONVERSIONS	22
4.6 APPLICATION PROGRAM INTERFACES	22
4.7 USER INTERFACE DESIGN	22
4.8 PERFORMANCE	25
4.9 ARCHITECTURE DESIGN	26
4.9.1 <i>Logical View</i>	26
4.9.2 <i>Hardware Architecture</i>	27
4.9.3 <i>Software Architecture</i>	28
4.9.4 <i>Security Architecture</i>	29
CHAPTER 5	30
5. IMPLEMENTATION	30
5.1.0 <i>Arduino Atmega 2560</i>	30
5.1.2 <i>18650 Battery cell</i>	31
5.1.3 <i>Ultrasonic Sensor Hc-Sr04</i>	31
5.1.4 <i>IR Sensor</i>	32
5.1.5 <i>RFID Kit</i>	33
5.1.6 <i>L298 Motor Driver</i>	33
5.2.0 <i>Designing Android Application</i>	34
5.2.1 <i>Ideation:</i>	34
5.2.2 <i>Drawing a wireframe:</i>	34
5.2.3 <i>Picking your IDE and setting it up:-</i>	34
5.2.4 <i>Learning the fundamentals of C:</i>	35
5.2.5 <i>Getting the correct order delivered:</i>	35
5.2.6 <i>Building a format:</i>	35
5.2.7 <i>Composing the code:</i>	35
5.2.8 <i>Actualizing further developed usefulness:</i>	35
5.2.9 <i>Including some additional clean:</i>	35
5.2.10 <i>Sending data from android by using Bluetooth Module</i>	36
CHAPTER 6	37
6. TESTING	37
6.1 PURPOSE OF THE TEST PLAN DOCUMENT	37
6.2 FUNCTIONAL TESTING	37
6.2.1 TEST RISKS / ISSUES	37
6.2.3 <i>Test Approach(s)</i>	38
6.2.4 <i>Test Regulatory/Mandate Criteria</i>	38
6.2.5 <i>Test Pass / Fail Criteria</i>	38
6.2.6 <i>Test Entry / Exit Criteria</i>	38

6.2.7 Test Deliverables	38
6.2.8 Test Suspension/Resumption Criteria	38
6.2.9 Test Environmental/Staffing/Training Needs	38
6.3 PERFORMANCE TESTING	39
6.3.1 Load Testing	39
6.3.2 Test Risks/Issues	39
6.3.3 Items to be Tested	39
6.3.4 Test Approach(s)	39
6.3.5 Test Regulatory / Mandate Criteria	39
6.3.6 Test Pass / Fail Criteria	40
6.3.7 Test Entry / Exit Criteria	40
6.3.8 Test Deliverables	40
6.4 STRESS TESTING	40
6.4.1 Test Risks / Issues	40
6.4.2 Items to be tested	40
6.4.3 Test Approach(s)	40
6.4.4 Test Regulatory / Mandate Criteria	41
6.4.5 Test Pass / Fail Criteria	41
6.4.6 Test Entry / Exit Criteria	41
6.4.8 Test Suspension / Resumption Criteria	41
6.4.9 Test Environmental / Staffing / Training Needs	42
6.5 SYSTEM TESTING	42
6.5.1 Test Risks / Issues	42
6.5.2 Test Approach(s)	42
6.5.3 Test Environmental / Staffing / Training Needs	42
CHAPTER 7	43
CHAPTER 8	46
8. CONCLUSIONS AND FUTURE WORK	46
8.1 CONCLUSIONS	46
8.2 FUTURE WORK	47
9. REFERENCES	48
APPENDICES	A-1
APPENDIX A:	A-1
APPENDICES B -	A-16
APPENDICES C -	A-19
APPENDICES D -	A-20
APPENDICES E -	A-21