



CAR APPRAISAL APPLICATION

Nafay Ur Rehman

02-134201-042

Muhammad Anas Inam

02-134201-072

Hafiz Muhammad Usama Azlan

02-134201-022

**A project report submitted in partial fulfilment of the
Requirements for the award of the degree of
Bachelor of Science in (Computer Science)**

**Department of Computer Science
Bahria University, Karachi**

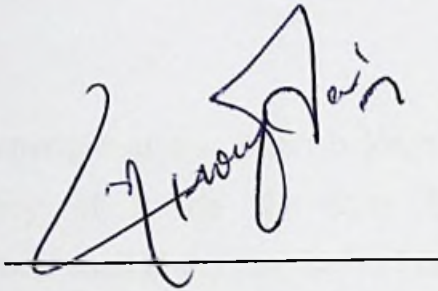
2023

APPROVAL FOR SUBMISSION

We certify that this project report entitled **"CAR APPRAISAL APPLICATION"** was prepared by **Nafay Ur Rehman, Muhammad Anas Inam, Hafiz Muhammad Usama Azlan** has met the required standard for submission in partial fulfilment of the requirements for the award of Bachelor of Science (Computer Science) at Bahria University, Karachi.

Approved by,

Signature :



Supervisor : Mr Muhammad Marouf

Date

: 25 Jan, 24

The copyright of this report belongs to Bahria University according to the Intellectual Property Policy of Bahria University BUORIC-P15 amended on April 2019. Due acknowledgement shall always be made of the use of any material contained in, or derived from, this report.

© 2023 Bahria University. All right reserved.

ACKNOWLEDGEMENTS

We would like to thank everyone who had contributed to the successful completion of this project. We would like to especially grateful to my project supervisor, Mr. Mahamud Maruf for his constructive advice, guidance and the constant support throughout the development of the research.

Specially dedicated to

My beloved grandmother, mother and father

Nafay Ur Rehman

My beloved grandmother, mother and father

Muhammad Anas Inam

My beloved grandmother, mother and father

Hafiz Muhammad Usama Azlan

ACKNOWLEDGEMENTS

We would like to thank everyone who had contributed to the successful completion of this project. We would like to express my gratitude to my project supervisor, **Mr Muhammad Marouf** for his invaluable advice, guidance and his enormous patience throughout the development of the research.

In addition, we would also like to express our gratitude to our loving parents and friends who have helped and given us encouragement.

CAR APPRAISAL APPLICATION

TABLE OF CONTENTS

ABSTRACT

DECLARATION

ACKNOWLEDGEMENT

The valuation of used cars has long been plagued by manual methods, leading to inconsistencies, limited data access, and an inability to adapt swiftly to market changes. This challenge prompted the development of the Car Appraisal Application, a transformative solution leveraging advanced technologies, particularly Machine Learning (ML) algorithms. This application addresses the lack of standardization in traditional valuation methods, introducing automated algorithms for precise predictions. By centralizing extensive vehicle and market data, it mitigates the issue of limited data access, ensuring comprehensive and real-time insights. The system's adaptability to evolving market trends, a key feature, enables dynamic valuation adjustments in response to changing conditions. Car Appraisal Application emerges not only as a technological innovation but as a solution to longstanding challenges in the automotive industry. It promises standardization, comprehensive data access, and dynamic adaptability, revolutionizing the car appraisal process. This project sets the stage for future advancements, with a commitment to addressing emerging trends and challenges in the ever-evolving automotive landscape.

1.1 Introduction	1
1.2 Problem Statement	2
1.3 Objectives	3
1.4 Scope of Work	4
1.5 Significance	5
2.1 Literature Review	6
2.2 Methodology	7
2.3 Data Collection and Preprocessing	8
2.4 Model Development	9
2.5 Evaluation and Results	10
2.6 Conclusion	11
2.7 Future Work	12
2.8 Appendix	13
2.9 Bibliography	14
2.10 Glossary	15
2.11 Acknowledgements	16
2.12 Declaration	17
2.13 Appendix A: Dataset Description	18
2.14 Appendix B: Model Performance Metrics	19
2.15 Appendix C: User Interface Mockups	20
2.16 Appendix D: Code Snippets	21
2.17 Appendix E: Project Timeline	22
2.18 Appendix F: Team Roles and Responsibilities	23
2.19 Appendix G: Risk Assessment	24
2.20 Appendix H: Project Budget	25
2.21 Appendix I: Project Charter	26
2.22 Appendix J: Project Closure Report	27
2.23 Appendix K: Project Post-Mortem	28
2.24 Appendix L: Project Lessons Learned	29
2.25 Appendix M: Project Stakeholder Feedback	30
2.26 Appendix N: Project Communication Log	31
2.27 Appendix O: Project Risk Register	32
2.28 Appendix P: Project Change Log	33
2.29 Appendix Q: Project Status Report	34
2.30 Appendix R: Project Meeting Minutes	35
2.31 Appendix S: Project Deliverables	36
2.32 Appendix T: Project Milestones	37
2.33 Appendix U: Project Risks	38
2.34 Appendix V: Project Opportunities	39
2.35 Appendix W: Project Threats	40
2.36 Appendix X: Project Weaknesses	41
2.37 Appendix Y: Project Strengths	42
2.38 Appendix Z: Project Summary	43

TABLE OF CONTENTS

DECLARATION	ii
APPROVAL FOR SUBMISSION	iii
ACKNOWLEDGEMENTS	vi
ABSTRACT	vii
TABLE OF CONTENTS	viii
LIST OF TABLES	xii
LIST OF FIGURES	xiii
LIST OF SYMBOLS / ABBREVIATIONS	xiv
LIST OF APPENDICES	xv

CHAPTER

1	INTRODUCTION	1
1.1	Background	1
1.1.1	Origins and Development of Car Appraisal Techniques	1
1.1.2	Digital Revolution in Car Appraisal	1
1.1.3	The Car Appraisal Application: A Modern Solution	2
1.2	Problem Statement	2
1.3	Aims and Objective	2
1.4	Scope of Project	3
1.4.1	Scope Deliverables	3
2	LITERATURE REVIEW	5
2.1	Introduction	5
2.2	Comparison with Existing Work:	5
2.2.1	Car Price Prediction using Machine Learning Techniques	6
2.2.2	Used Cars Price Prediction using Supervised Learning Techniques	6
2.2.3	Used Car Price Prediction using K-Nearest Neighbor Based Model	6
2.2.4	Car's Selling Price Prediction using Random Forest Machine Learning Algorithm	6
2.2.5	Old Car Price Prediction with Machine Learning	7
2.2.6	Used Car Price Prediction using Machine Learning with Optimal Feature	7
2.2.7	Price Prediction of Used Cars Using Machine Learning	8

		ix
	2.2.8 Used Car Price Predication using Machine Learning	8
	2.2.9 Prediction of Used Car Prices Using Machine Learning	8
	2.2.10 Vava Cars' Impact on Car Appraisal Strategies	9
	2.2.11 Car First's Influence on Car Appraisal Paradigms	9
	2.2.13 Conclusion	11
3	REQUIREMENT SPECIFICATION	12
3.1	Challenges	12
3.2	Proposed System	12
3.2.1	Overview	12
3.2.2	Key Features	13
3.3	Functional Requirements	13
3.3.1	User Registration	13
3.3.2	Car Information Input	13
3.3.3	Data Validation	13
3.3.4	Records	13
3.3.5	Algorithmic Analysis	13
3.3.6	Prediction	14
3.3.7	Final Valuation Presentation	14
3.3.8	Data Management	14
3.4	Non Functional Requirements	14
3.4.1	Security	14
3.4.2	Performance	14
3.4.3	Usability	14
3.4.4	Reliability	14
3.4.5	Compatibility	14
4	SYSTEM IMPLEMENTATION	15
4.1	Introduction	15
4.1.1	Technological Foundation	15
4.1.2	Data Collection and Preprocessing	15
4.1.3	Machine Learning Algorithms	15
4.2	System Components	15
4.2.1	Automated Car Appraisal System	15
4.2.2	User-Friendly Application	16
4.2.3	Real-time Market Reflection	16
4.2.4	Comprehensive Data Analysis	16
4.2.5	Transparent Valuation Process	16

	x
4.3 System Workflow	16
4.3.1 Data Input	16
4.3.2 Data Processing	16
4.3.3 Machine Learning Prediction	16
4.3.4 Valuation Output	17
4.4 Evaluation Metrics	17
4.5 Future Enhancements	17
5 DESIGN AND METHODOLOGY	18
5.1 Methodology	18
5.1.1 What is Agile	18
5.1.2 Scrum	20
5.1.3 How does Scrum works?	20
5.2 Implementation of Machine Learning Algorithms	21
5.2.1 Comparative Analysis of Machine Learning Algorithms	22
5.3 Results and Findings	22
5.4 Comparative Summary	23
5.5 Comparison with different Algorithms	26
5.6 Analysis of Choosing the Best Algorithm	27
5.7 Design	28
5.7.1 System Flow of Car Appraisal	28
5.7.2 System Flow of Car Appraisal	29
5.7.3 Gantt Chart	30
5.7.4 Front End Design (Application Interface)	31
6 TESTING AND EVALUATION	36
6.1 Introduction	36
6.2 Types of Testing	36
6.2.1 Unit Testing	36
6.2.2 Integration Testing	37
6.2.3 System Testing	37
6.2.4 Functional Testing	37
6.2.5 Non-Functional Testing	37
6.2.6 User Acceptance Testing (UAT)	37
6.2.7 Regression Testing	37
6.2.8 Performance Testing	37
6.2.9 Security Testing	37

	xi
6.2.10 Usability Testing	37
6.2.11 Compatibility Testing	38
6.3 ML Algorithm for Feature Extraction and Test Results	38
6.3.1 Data Collection and Preprocessing	38
6.3.2 Data Cleaning:	38
6.3.3 Data Labeling	38
6.3.4 Feature Extraction	38
6.3.5 Model Selection	38
6.3.6 Model Optimization	39
7 CONCLUSION AND FUTURE WORK	42
7.1 Conclusion	42
7.2 Future Work	42
REFERENCE	44
APPENDICIES	46