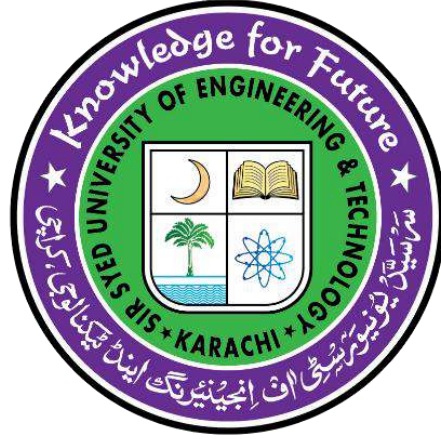


AVIAN TECH EMPORIUM



Project/Thesis ID. 2023: 10

Session: BS. Fall 2020

Project Supervisor: Razia Nisar Noorani

Submitted By

Ayesha Khan

Hunaina Hussain

Hammad Arain

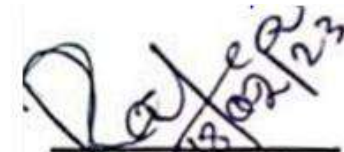
M. Saad Bin Saleem

Department of Computer Science

Sir Syed University of Engineering & Technology

Certification

This is to certify that Ayesha Khan-2020F-CS-051, Hunaina Hussain-2020F-CS-070, M. Saad Bin Saleem- 2020F-CS-148 and Hammad Arain-2020F-CS-259 have successfully completed the final project **Avian Tech Emporium**, at the **Sir Syed University of Engineering and Technology**, to fulfill the partial requirement of the degree **Computer Science**



Project Supervisor

External Examiner

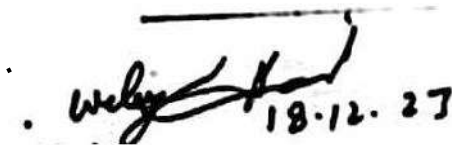
Razia Nisar Noorani

[Name of Examiner]

Assistant. Professor

[Designation]

\



Chairman

Department of Computer Science, Sir Syed University of Engineering and Technology

Project Title (Avian Tech Emporium)
Sustainable Development Goals

(Please tick the relevant SDG(s) linked with FYDP)

SDG No	Description of SDG	SDG No	Description of SDG
SDG 1	No Poverty	SDG 9	Industry, Innovation, and Infrastructure
SDG 2	Zero Hunger	SDG 10	Reduced Inequalities
SDG 3	Good Health and Well Being ✓	SDG 11	Sustainable Cities and Communities
SDG 4	Quality Education	SDG 12	Responsible Consumption and Production
SDG 5	Gender Equality	SDG 13	Climate Change
SDG 6	Clean Water and Sanitation	SDG 14	Life Below Water
SDG 7	Affordable and Clean Energy	SDG 15	Life on Land ✓
SDG 8	Decent Work and Economic Growth	SDG 16	Peace, Justice and Strong Institutions
		SDG 17	Partnerships for the Goals



Range of Complex Problem Solving			
	Attribute	Complex Problem	
1	Range of conflicting requirements	Involve wide-ranging or conflicting technical, engineering and other issues.	
2	Depth of analysis required	Have no obvious solution and require abstract thinking, originality in analysis to formulate suitable models. ✓	
3	Depth of knowledge required	Requires research-based knowledge much of which is at, or informed by, the forefront of the professional discipline and which allows a fundamentals-based, first principles analytical approach.	
4	Familiarity of issues	Involve infrequently encountered issues	
5	Extent of applicable codes	Are outside problems encompassed by standards and codes of practice for professional engineering.	
6	Extent of stakeholder involvement and level of conflicting requirements	Involve diverse groups of stakeholders with widely varying needs.	
7	Consequences	Have significant consequences in a range of contexts.	
8	Interdependence	Are high level problems including many component parts or sub-problems	
Range of Complex Problem Activities			
	Attribute	Complex Activities	
1	Range of resources	Involve the use of diverse resources (and for this purpose, resources include people, money, equipment, materials, information and technologies).	
2	Level of interaction	Require resolution of significant problems arising from interactions between wide ranging and conflicting technical, engineering or other issues.	
3	Innovation	Involve creative use of engineering principles and research-based knowledge in novel ways. ✓	
4	Consequences to society and the environment	Have significant consequences in a range of contexts, characterized by difficulty of prediction and mitigation.	
5	Familiarity	Can extend beyond previous experiences by applying principles-based approaches.	

Abstract

The innovative initiative of Avian Tech Emporium addresses the challenges confronted by bird enthusiasts in Pakistan, providing a comprehensive online platform to connect buyers and sellers nationwide. Going beyond mere transactions, this pioneering project introduces a transformative virtual space leveraging state-of-the-art machine learning-based scanning technology, as detailed in [1] Ou et al.'s (2020) research on object recognition. The aim is to enhance accessibility and convenience in the realm of bird trading.

The research methodology meticulously explores the existing challenges in traditional bird markets, serving as a guiding force in the development of Avian Tech Emporium. The findings reveal a significant shift in accessibility and convenience through the incorporation of advanced technology. The user-friendly app not only facilitates transactions but also integrates a knowledge-rich blog and a search and explore feature, elevating the overall bird discovery experience.

Avian Tech Emporium aspires to revolutionize bird trading practices in Pakistan and stands as a model for the integration of technology in niche markets. The incorporation of machine learning and the establishment of a virtual marketplace extend beyond bird trading, holding broader implications for the modernization of traditional practices. This thesis contributes valuable insights into the methodological approach, technological advancements, and the overall impact of Avian Tech Emporium, emphasizing its potential application in various domains, particularly within the realm of computer-based solutions.

Undertaking

I certify that the project **Avian Tech Emporium** is our own work. The work has not, in whole or in part, been presented elsewhere for assessment. Where material has been used from other sources it has been properly acknowledged/ referred.



Scanned with CamScanner

Hammad Arain

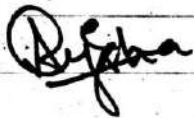
2020F-CS-259



Scanned with CamScanner

M. Saad Bin Saleem

2020F-CS-148



Scanned with CamScanner

Ayesha Khan

2020F-CS-051



Scanned with CamScanner

Hunaina Hussain

2020F-CS-070

Acknowledgement

The successful completion of this project stands as a testament to the collective effort and collaboration of a dedicated group of individuals. We express our deepest gratitude to those who played pivotal roles in contributing to the fruition of our endeavors.

Our sincere appreciation goes to our Supervisor **Ms. Razia Nisar Noorani**, whose mentorship and expertise provided invaluable guidance throughout the project lifecycle. We are indebted to her for her constructive critique and thoughtful suggestions, which greatly contributed to the refinement and polish of our project.

Acknowledgment is also due to our friends and families for their unwavering support during the challenges and demands of this project.

Additionally, we express our gratitude to **Sir Syed University of Engineering & Technology** for their provision of resources and support, contributing to the seamless execution of our project.

Table of Contents

Certification	i
Abstract	iv
Undertaking	v
Acknowledgement	vi
Table of Contents	vii
List of Figures	viii
Chapter 1	1
1.1	1
1.2	2
1.3	2
1.4	3
1.5	3
1.6	4
Chapter 2	7
2.1	7
Chapter 3	8
3.1	8
References	9

List of Figures

Figure 1: Agile Methodology	4
Figure 2: System Architecture Diagram	6

Chapter 1

1.1 Introduction

In Pakistan, where the passion for birds is widespread, enthusiasts often face challenges in navigating the traditional bird trading landscape. The process of physically visiting various bird markets can be both time-consuming and daunting for buyers, while sellers encounter their own set of difficulties. Recognizing these issues, our mission with Avian Tech Emporium is to revolutionize the bird trading experience across Pakistan by introducing a cutting-edge online platform.

Our virtual platform serves as a dynamic space connecting bird buyers and sellers nationwide. Sellers could showcase their birds and a diverse range of bird-related products, essentially creating virtual bird markets accessible to users across the country. Buyers, in turn, enjoy the convenience of exploring and selecting their desired birds from the comfort of their homes, eliminating the challenges associated with traditional methods.

However, Avian Tech Emporium goes beyond mere transactions. The user-friendly app introduces innovative features to enhance the overall bird enthusiast experience. Inspired by the latest advancements in bird scanning technology, as detailed in [1] Ou et al.'s (2020) research on object recognition, our platform incorporates a state-of-the-art bird scanning tool. This tool utilizes smart machine-learning technology, enabling users to effortlessly identify different bird species with precision.

Moreover, the platform hosts a knowledge-rich blog, providing users with valuable insights into various aspects of bird care, behavior, and species information. The search and explore feature further encourage users to delve into the fascinating world of birds, making discoveries beyond their initial interests.

In essence, Avian Tech Emporium aspires to be more than just a transactional platform. It aims to create a vibrant community, catering to the diverse needs of bird enthusiasts, buyers, sellers, and anyone with a passion for the avian world. By leveraging technology and innovation, we are committed to making bird trading accessible, enjoyable, and educational for everyone involved.

1.2 Statement of the problem

This application is developed to solve the following problems:

- There is no special app in Pakistan just for birds, where people can buy, sell, and learn about them.
- Right now, there's no special place where bird lovers can easily find and trade birds or bird tech stuff.
- No such application which provides AI features to detect the bird species and their information with one click.
- There is no such platform where you will get blogs related to birds.
- No such applications which provide veterinary services/FAQ related to birds' illness.
- No such platform where you buy accessories and food in one click.

1.3 Goals/Aims & Objectives

The following are the objectives of "Avian Tech Emporium":

- This project aims to establish a dedicated online marketplace that caters to the unique needs of bird enthusiasts in Pakistan. It provides a one-stop platform for easily discovering and acquiring birds.
- This project offers a comprehensive one-stop platform for bird food, ensuring bird enthusiasts can easily find and purchase a variety of nutritional options for their feathered companions.
- Accessorize your avian companions with ease on Avian Tech Emporium, providing a convenient one-stop platform for a diverse range of bird accessories, from perches to toys, catering to the diverse needs of bird owners.
- This project simplifies the process of caring for your birds by offering a one-stop platform for medication, providing bird owners with easy access to a variety of avian healthcare products for their feathered friends' well-being. It provides a one stop platform for accessories.
- To develop the Free Bird Store mobile app, designed with user-friendliness in mind. It enables people to scan and identify various bird species, enhancing their birdwatching experience.
- To create a comprehensive platform for buying, selling, and exploring birds and a diverse array of bird-related products. It offers a convenient hub for bird enthusiasts.
- To enrich the user experience by offering a dedicated blog section filled with engaging and educational content about birds and guidelines.
- The welfare and well-being of birds are a top priority in all transactions.

1.4 Motivation

The motivation behind Avian Tech Emporium lies in addressing the absence of a dedicated online platform for bird enthusiasts in Pakistan. Recognizing the challenges faced by both buyers and sellers in connecting and accessing relevant information, the project aims to create a comprehensive solution. Inspired by recent advancements in AI-driven bird identification, the app seeks to enhance the bird-watching experience. Beyond transactions, Avian Tech Emporium aspires to be a virtual hub, providing educational content, veterinary services, and a one-stop marketplace for bird-related products. The project is motivated by the vision of filling market gaps, fostering a thriving online bird community, and leveraging technology for an enriched bird care experience in Pakistan.

1.5 Assumption and Dependencies

The following assumptions and dependencies serve as foundational considerations, guiding the project's development and highlighting areas critical for successful implementation. Regular reviews and adjustments will be made to these assumptions and dependencies throughout the project lifecycle to ensure relevance and alignment with evolving conditions.

1.5.1 Assumptions

- 1.5.1.1 User Internet Access:** The assumption that the target user base has reliable internet access for seamless interaction with the online platform.
- 1.5.1.2 Device Compatibility:** Assuming that the Avian Tech Emporium platform will be compatible with a variety of devices, including smartphones, tablets, and computers.
- 1.5.1.3 Legal Compliance:** Assuming adherence to legal and regulatory requirements related to online trading, animal welfare, and data protection laws.
- 1.5.1.4 User Engagement:** Assuming a positive response from users regarding the adoption of the bird scanning tool, blog content, and search features.
- 1.5.1.5 Market Acceptance:** Assuming that the bird trading community in Pakistan will embrace and adopt the online platform over traditional methods.

1.5.2 Dependencies:

- 1.5.2.1 **Technology Infrastructure:** The project is dependent on a robust technological infrastructure, including servers, databases, and secure data storage systems.
- 1.5.2.2 **Research and Development:** Dependencies on ongoing research and development to enhance the accuracy and features of the bird scanning tool.
- 1.5.2.3 **Content Creation:** Dependencies on a consistent flow of high-quality content for the knowledge-rich blog, necessitating content creation resources.
- 1.5.2.4 **User Feedback:** Dependencies on user feedback to guide updates and improvements, making regular user engagement and feedback loops crucial.
- 1.5.2.5 **Marketing Strategies:** Dependencies on effective marketing strategies to reach and attract the intended audience of bird enthusiasts and traders.

1.6 Methods;

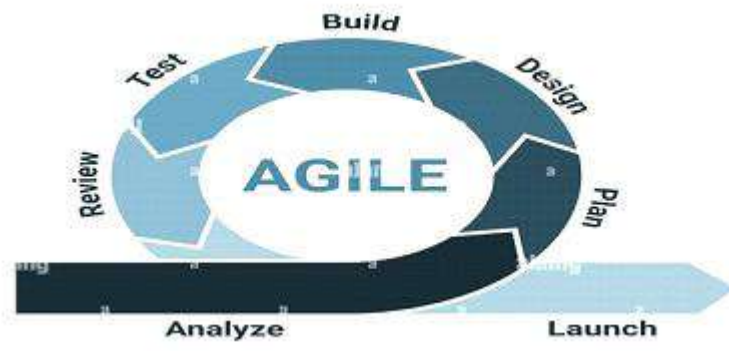


Figure 1: Agile Methodology

Choosing the Agile model for Avian Tech Emporium, as outlined by Chan and Thong's critical review and conceptual framework [2], is like picking a tool that can easily change and adapt. It helps us make the bird-loving app better by delivering small, useful parts regularly, like bird identification and blog updates. Agile encourages teamwork and getting better all the time, making it simple to match the app with what bird lovers in Pakistan really want. This is super important in the ever-changing world of online bird stuff, helping Avian Tech Emporium stay cool and give users a happy experience.

- 1.6.1 Analyze and Market Research:** In the initial phase of creating the Avian Tech Emporium app, our focus is on delving into the world of bird and tech enthusiasts. Through surveys, interviews, and conversations, we aim to gain a deep understanding of their desires and preferences. Simultaneously, we conduct comprehensive market research to unveil current trends and user preferences. By merging these efforts, we gather valuable insights that not only inform our understanding of individual needs but also shape our awareness of broader industry dynamics. This dual approach ensures that Avian Tech Emporium is not only aligned with individual desires but also positioned to navigate and contribute to the evolving trends in the avian technology market.
- 1.6.2 Plan:** Armed with insights from our analysis and market research, the next step is to craft a solid plan for Avian Tech Emporium. We'll outline a clear vision that aligns with the expectations of birds and tech enthusiasts. This planning phase involves defining features, setting priorities, and establishing a roadmap for development. The goal is to ensure that our app not only meets but exceeds the expectations of our target audience.
- 1.6.3 Design:** Before we build the Avian Tech Emporium app, we think about how it should look and work. This design part is all about making it easy for people to use. We want the app to look nice and be practical, so we create early versions to test and make it better. Our goal is to have a design that's not just pretty but also makes it simple and enjoyable for users to use the app.
- 1.6.4 Build:** In this phase, we'll assemble all the components of the Avian Tech Emporium app. Using React Native for development, we'll ensure the app works smoothly on various devices. The app's features include bird scanning using machine learning, a marketplace for buying and selling birds, a shop for bird-related products, as well as information and search features for bird exploration.
- 1.6.5 Testing:** During this stage, we will thoroughly examine every aspect of the Avian Tech Emporium app to confirm its proper functionality and to identify and address any issues or bugs. Our goal is to deliver a seamless and reliable user experience.
- 1.6.6 Review:** In the review stage, we carefully check how well the Avian Tech Emporium app is coming along in each step. We look at the results of testing to make sure everything works smoothly. We also have regular meetings to discuss what's going well and what can be improved, helping us make the app better and better over time.
- 1.6.7 Launch:** Once the Avian Tech Emporium app is ready, we will make it accessible to all users. Beyond deployment, we are committed to maintaining the app over time, ensuring it remains reliable and provides a long-lasting and enjoyable experience for our users.

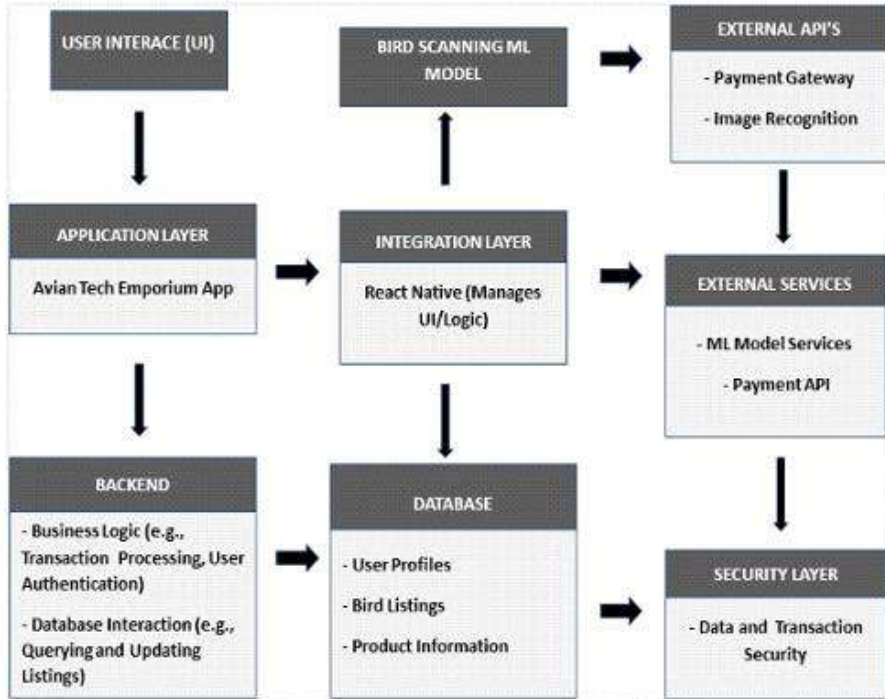


Figure 2: System Architecture Diagram

Chapter 2

2.1 Summary and Future work

The "Avian Tech Emporium" project is a comprehensive initiative aimed at addressing the challenges faced by bird enthusiasts, buyers, and sellers in Pakistan's traditional bird market. The central theme revolves around the development of a dedicated online platform that serves as a one-stop solution for bird-related activities. The primary goal is to connect buyers and sellers, offering a virtual marketplace for birds and a diverse range of bird-related products and services.

The project's purpose is multifaceted. Firstly, it seeks to simplify the bird trading process, providing convenience for buyers and sellers who can now engage in transactions from the comfort of their homes. Beyond transactions, the project aims to enhance the overall birdwatching experience through the incorporation of advanced technology. Inspired by a machine learning-based object recognition system, the application features a bird scanning tool that facilitates easy identification of various bird species.

To gather information, the project employed a dual approach, involving surveys, interviews, and conversations with bird and tech enthusiasts for a deep understanding of their needs. Simultaneously, comprehensive market research was conducted to identify current trends and user preferences in the avian technology market.

The results of the project include the development of the "Avian Tech Emporium" mobile app with features like bird scanning, a virtual marketplace, and a blog section. The conclusions drawn from the project emphasize the importance of creating a user-friendly platform that caters to the diverse needs of bird owners and enthusiasts. The recommendations include potential future developments, such as expanding AI features for bird identification, collaborating with experts for veterinary services, and continuously updating the app based on user feedback and industry dynamics.

In essence, "Avian Tech Emporium" represents a pioneering effort to bridge the gap between bird buyers and sellers, offering a technologically advanced and user-friendly platform that enriches the bird-related experience for enthusiasts in Pakistan.

Looking ahead in **future**, Avian Tech Emporium is set for exciting developments. We're boosting the accuracy of our bird scanning tool with advanced AI algorithms and teaming up with bird experts for precise species identification. Partnerships with avian healthcare professionals will enhance our veterinary services, providing authoritative info on bird health. To make a positive impact on the environment, we're collaborating with conservation groups and adding educational content on bird conservation and eco-friendly practices. Our future includes more than just buying and selling – think adoption and fostering options. We're building a sense of community with user engagement features and exploring global expansion opportunities. Regular updates based on user feedback and a commitment to inclusivity will ensure our platform stays successful. In essence, it envisions a dynamic, evolving, and globally impactful platform that not only meets current user needs but anticipates emerging trends in bird tech and conservation.

3.1 Conclusion & Recommendation

In conclusion, the journey of Avian Tech Emporium has been an ambitious endeavor to revolutionize the bird enthusiast community in Pakistan. With the goal of bridging the gaps in traditional bird trading markets, our dedicated online platform now provides a seamless experience for buyers and sellers, fostering a vibrant marketplace for birds and related products. We embarked on this venture with the objective of creating a user-friendly space that goes beyond transactions, incorporating advanced technology for bird scanning and identification inspired by machine learning.

We recommend continuous improvement and expansion to strengthen Avian Tech Emporium's impact. Enhance the bird scanning tool's accuracy through ongoing collaboration with ornithology experts and regular AI algorithm updates. Strengthen partnerships with avian healthcare professionals for authoritative bird health information. Maximize environmental impact by deepening collaborations with conservation organizations and promoting eco-friendly practices in educational content. Expand the marketplace to include adoption and fostering options, fostering a compassionate community. Regular user feedback loops should guide updates, ensuring the platform stays responsive. In essence, Avian Tech Emporium's success lies in its adaptability, growth, and ongoing contribution to the well-being of birds, solidifying its place in the avian community in Pakistan and beyond.

References

[1] Ou, Y.Q., Lin, C.H., Huang, T.C., and Tsai, M.F., 2020, September. Machine learning-based object recognition technology for bird identification system. In *2020 IEEE International Conference on Consumer Electronics-Taiwan (ICCE-Taiwan)* (pp. 1-2).

[2] Chan, F.K. and Thong, J.Y., 2009. Acceptance of agile methodologies: A critical review and conceptual framework. *Decision support systems*, 46(4), pp.803-

