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FARMLINK:
A digital Agri-tech marketplace
connecting Pakistani farmers directly to customers



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DEDICATION

This research is for the farmers of Pakistan who wake up early every morning and struggle with difficult climatic conditions and scorching heat in order to feed the nation. In spite of their important role in the welfare of the country, they do not get enough appreciation and reward for their efforts. The unconditional support from our parents in the form of sacrifice, prayers, and motivation has helped us survive the tough times. Furthermore, the help and guidance received from the faculty members of Bahria University have enabled us to become the engineers and individuals that we dream to be.

ACKNOWLEDGEMENT

It should be noted that all progress made during the course of this project was due to mercy of Allah. Without His blessings, it would not even come to life after first lines of code and draft writing attempts. Each step is credited to Him.

Also, there are words of gratitude to be said for the project supervisor. His patience, attention to details and constant encouragement made it possible for us to turn our idea into a real working software. Hours spent discussing the work, reviewing manuscripts and encouraging us taught us important lessons of computer science.

Special gratitude should be addressed to Bahria University, Islamabad Campus, and especially to the Computer Science Department, which provided atmosphere where curiosity is encouraged and ambitious ideas can grow. There is also special thank you to Ma'am Qurat Ul Ain Waqar who helped keep things going in our Final Year Project despite its ever-growing complexity, as well as to Dr. Qazi Subhan for his remarkable leadership.

From the side of the team, cooperation gave us insight into the process. Syed Sharjeel Ali Bukhari designed the UI and visuals of FarmLink. Faizan Mehmood dealt with architecture and server reliability. Ali Tahir participated in testing and documentation writing while ensuring everything was going according to the plan. Overall, we got an idea of what trust means when it comes to teamwork.

Last but not least, words of thanks should be addressed to Pakistani farmers. Even though we could not talk to each and every one of them personally, discussions about vegetables held in Rawalpindi and Islamabad markets, as well as related media sources confirmed our purpose of FarmLink.

EXECUTIVE SUMMARY

First and foremost, FarmLink stands out as a web-based marketplace solution for the well-known inefficiency in the agricultural market of Pakistan: the unjustified gap between those producing food and consumers buying food. The traditional supply chain through mandi leads to farmers being underpaid, consumers being overcharged, and a lot of food going to waste because of slow and poorly-coordinated process. FarmLink cuts out these intermediaries and gives a transparent digital route. As a result, users will be able to look through their fresh products, determine their source farms and buy products through WhatsApp – the leading messaging app in Pakistan.

Technically, FarmLink is developed with Node.js and Express, uses MongoDB Atlas database, and has very minimalistic front-end built with only plain HTML, CSS, and JS to be able to run even on the most primitive devices and in low-connectivity areas. The design is focused on maximum accessibility. The product offers customer storefront with search, filtering and sorting, freshness tracker calculating "freshness score" based on harvest date and displaying it with a colored bar, admin dashboard for managing stocks and orders with CSV export feature, and profile pages for farmers. The first batch includes ten authentic products from Pakistan – from veggies and fruits to dairy and grains at realistic prices in 2026 PKR.

The project is deployed to Railway, linked with MongoDB Atlas. Production performance is steady. Testing done on both Windows and macOS shows good cross-platform compatibility in terms of all browsers and form factors. Simulated pricing analysis hints at potential cost reduction of 15–30% for consumers on essential products and additional profit for farmers per kg. Overall, FarmLink isn't just another application; it proves that a simple user-oriented web-based platform accounting for peculiarities of rural Pakistan can contribute to redistribution of profit.

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