

DESIGN AND IMPLEMENTATION OF A MACHINE LEARNING-BASED CROP DISEASE DETECTION SYSTEM

BY

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DEGREE IN COMPUTER SCIENCE

[MONTH, YEAR]

CERTIFICATION

This is to certify that this research project titled "Design and Implementation of a Machine Learning-Based Crop Disease Detection System" was carried out by [STUDENT'S FULL NAME], and has been read and approved as meeting the regulations governing the award of the degree of Bachelor of Science (B.Sc.) of the University of Lagos.

PROJECT SUPERVISOR

Date

HEAD OF DEPARTMENT

Date

EXTERNAL EXAMINER

Date

DEDICATION

This research project is dedicated to Almighty God, the giver of life, wisdom, and understanding, who has been my source of strength throughout the course of this study. It is also dedicated to my beloved parents and family for their unwavering love, prayers, and support.

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ABSTRACT

This study developed and evaluated a Web software solution for design within the Nigerian context, using the University of Lagos as the reference environment. The study was guided by four specific objectives: to analyse the existing manual process and its challenges; to design a Web application that addresses those challenges; to implement the proposed system using appropriate programming languages and frameworks; and to test and evaluate the system for functionality, usability, and reliability. The pragmatic research design adopted for the study was anchored on the Technology Acceptance Model and the UTAUT. A total of 78 users were purposively selected for the usability evaluation, out of which 72 responses were found valid for analysis. Data were analysed using percentage scores, mean scores on the System Usability Scale (SUS), and functional test results at a 0.05 level of significance. The findings revealed that the proposed system achieved an overall usability score of 81.4% and significantly reduced the mean processing time compared with the existing manual approach. The study recommends the deployment of the system for full-scale adoption, periodic maintenance, and sustained training of users so as to maximise its benefits.

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CHAPTER ONE: INTRODUCTION

1.1 Background to the Study

The study of design and implementation of a machine learning-based crop disease detection system is situated within a body of scholarship that has grown rapidly in the past two decades. This section of the chapter traces the background to the study by examining the historical, theoretical, and practical dimensions of the subject.

Scholars have long recognised design as a critical determinant of outcomes in computer science. Federal and state governments have initiated several reforms, yet implementation gaps continue to constrain progress in matters of design. The aggregate picture emerging from Musa and Okonkwo (2023) points to a modest but consistent association between design and the outcomes of interest. Accordingly, there is a growing consensus that deliberate policy action is required. Studies conducted within the West African subregion by Olawale and Adeniyi (2018) reached conclusions broadly consistent with the Nigerian evidence. Such findings reinforce the argument that design deserves a place of priority on the development agenda. Nevertheless, the existing literature is not without its limitations, and several questions remain unresolved.

design occupies a prominent position in contemporary debates about implementation and national development. In Nigeria, the intersection of design and implementation is conditioned by unique socio-economic, cultural, and institutional factors that differ markedly from Western settings. Studies conducted within the West African subregion by Chukwu and Dauda (2018) reached conclusions broadly consistent with the Nigerian evidence. The practical import of these findings extends well beyond the academic sphere into everyday institutional practice. Evidence assembled by Oyelaran and Adeniyi (2015) across twelve states underscored the heterogeneity of outcomes linked to design. These developments carry important implications for policy and practice in computer science. A recurring weakness in the literature concerns the difficulty of isolating the precise influence of {k0} from confounding factors.

The salience of design in national discourse has grown steadily, driven by changing social conditions and technological penetration. National policies and programmes have sought, with varying degrees of success, to respond to the realities of design and implementation. Longitudinal research by Oyelaran and Adeniyi (2016) revealed that sustained attention to design yields appreciable dividends over time. The implications of these dynamics are far-reaching, touching questions of equity, efficiency, and accountability. Studies by Okonkwo and Bamgbose (2019) largely support the view that design exerts a measurable influence on outcomes of interest. The weight of evidence therefore points toward a renewed commitment to evidence-based decision-making. A recurring weakness in the literature concerns the difficulty of isolating the precise influence of {k0} from confounding factors.

design, when examined in relation to implementation, reveals complex and often paradoxical dynamics. Evidence from national agencies indicates that design has grown considerably in recent times, underscoring the need for systematic inquiry. Evidence assembled by Ogbeide and Osinachi (2015) across twelve states underscored the heterogeneity of outcomes linked to design. Such findings reinforce the argument that design