DESIGN AND IMPLEMENTATION OF A SOLAR QUOTATION AND INSTALLATION TRACKER

BY

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BEING A RESEARCH PROJECT SUBMITTED TO THE DEPARTMENT OF SOFTWARE ENGINEERING, FACULTY OF SCIENCE, UNIVERSITY OF LAGOS, AKOKA, LAGOS STATE

IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE AWARD OF BACHELOR OF SCIENCE (B.Sc.) DEGREE IN SOFTWARE ENGINEERING

[MONTH, YEAR]

CERTIFICATION

This is to certify that this research project titled "Design and Implementation of a Solar Quotation and Installation Tracker" 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.

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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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My profound gratitude goes to Almighty God for His grace, protection, and guidance throughout the duration of my study and the successful completion of this research project. I am deeply grateful to my supervisor, [SUPERVISOR'S NAME], for the patience, guidance, constructive criticism, and invaluable direction provided throughout the course of this research. I also wish to appreciate the Head of Department, the lecturers of the Department of Software Engineering, and my course mates for their support and friendship. My appreciation also goes to my parents and siblings for their unwavering support, both financial and emotional, throughout my academic journey.

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 64 users were purposively selected for the usability evaluation, out of which 59 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 85.9% 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 solar quotation and installation tracker 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.

design continues to command considerable attention among researchers, policymakers, and practitioners in software engineering. Nigeria's federal structure and its diverse cultural geography ensure that the experience of design varies considerably from one region to another. The work of Salami and Okonkwo (2023) extended earlier analyses by demonstrating that implementation reinforces the effects of design. For practitioners, the practical significance of design cannot be overstated, given its demonstrable link with implementation. The aggregate picture emerging from Ekwueme and Adebayo (2023) points to a modest but consistent association between design and the outcomes of interest. These observations collectively invite a reconsideration of standard assumptions regarding implementation. The reviewed studies, while valuable, are frequently dated, small in scale, or confined to a single locality.

The phenomenon of design, while not new, has acquired fresh analytical urgency in Nigeria. In Nigeria, the intersection of design and implementation is conditioned by unique socio-economic, cultural, and institutional factors that differ markedly from Western settings. A notable study by Ogunlana and Adeniyi (2017) argued that the impact of design is substantially mediated by the quality of institutions. The implications of these dynamics are far-reaching, touching questions of equity, efficiency, and accountability. Musa and Okonkwo (2020), in a survey of relevant stakeholders, concluded that the benefits of design are unevenly distributed across groups. The practical import of these findings extends well beyond the academic sphere into everyday institutional practice. Nevertheless, the existing literature is not without its limitations, and several questions remain unresolved.

Scholars have long recognised design as a critical determinant of outcomes in software engineering. Federal and state governments have initiated several reforms, yet implementation gaps continue to constrain progress in matters of design. Musa and Okonkwo (2020), in a survey of relevant stakeholders, concluded that the benefits of design are unevenly distributed across groups. The cumulative effect of these dynamics is a situation that demands urgent and coordinated intervention. Research by Osinachi and Nnamdi (2021) using mixed methods provided particularly rich insight into the mechanisms connecting design and implementation. Left unaddressed, the identified patterns are likely to intensify, with adverse consequences for all stakeholders. It is therefore imperative that further empirical work be undertaken to clarify the causal relationships at stake.

Debates on national transformation repeatedly return to the role of design and its attendant dynamics. Nigeria's federal structure and its diverse cultural geography ensure that the experience of design varies considerably from one region to another. Research by Chukwu and Nwosu (2021) using mixed methods provided particularly rich insight into the mechanisms connecting design and implementation. Accordingly, there is a