

**EVALUATION OF THE PERSUASIVE DESIGN PRINCIPLES IN A  
WEB-BASED PRAYER APP**

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**APRIL, 2023**

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**BY**

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**A DISSERTATION SUBMITTED TO THE SCHOOL OF  
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COMPUTER AND INFORMATION SCIENCES, COLLEGE OF  
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OGUN STATE**

**APRIL, 2023**

## **ACCEPTANCE**

This is to attest that this dissertation is accepted in partial fulfillment of the requirements for the award of the degree of Master of Sciences in Computer Science in the Department of Computer and Information Sciences, College of Science and Technology, Covenant University, Ota, Nigeria.

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## **DECLARATION**

I hereby declare that **OLANIPEKUN, SAMUEL OKIKIOLUWA** with matriculation number (**20PCG02291**), carried out this research titled “Evaluation of the Persuasive Design Principle in a Web-based Prayer App”. It was carried out under the supervision of Dr. Azubuike Ezewonke. I attest that the dissertation has not been presented either wholly or partially for the award of any degree elsewhere. All sources of data and scholarly information used in this dissertation are duly acknowledged.

**OLANIPEKUN, SAMUEL OKIKIOLUWA**

**Signature and Date**

## **CERTIFICATION**

We certify that this dissertation titled “**EVALUATION OF THE PERSUASIVE DESIGN PRINCIPLES IN A WEB-BASED PRAYER APP**” is an original research carried out by **OLANIPEKUN, SAMUEL OKIKIOLUWA (20PCG02291)** in the Department of Computer and Information Sciences, College of Science and Technology, Covenant University, Ota, Ogun State, Nigeria under the supervision of Dr. Azubuike Ezenwoke. We have examined and found this work acceptable as part of the requirements for the award of Master of Science (M.Sc.) in Computer Science.

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## **DEDICATION**

I dedicate this dissertation to first and foremost the Almighty God for His grace and mercies and also, to my dad for his unwavering support throughout my Master's Degree Programme.

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## LIST OF ABBREVIATIONS

PPQ	The Persuasive Potential Questionnaire
PSD	Persuasive System Design
PWA	Progressive Web Application
HCI	Human-Computer Interaction
ICT	Information Communication Technology
PT	Persuasive Technology
BC	Behavioral Change
HTML	Hypertext Markup Language
CSS	Cascading Stylesheet
APP	Application
FBM	Fogg Behavioral Model
TRA	Theory of Reasoned Action
TPB	Theory of Planned Behavior
SCT	Social Cognitive Theory
AT	Activity Theory
SDT	Self-Determination Theory
TTM	The Transtheoretical Model
PAPM	The Precaution Adoption Process
ELM	Elaboration Likelihood Model
PTS	Primary Task Support
SS	Social Support
DS	Dialogue Support
PE	Perceived Effectiveness
SC	System Credibility
CI	Continuance Intention
PPC	Perceived Product Credibility
PRC	Perceived Review Credibility
PSC	Perceived System Credibility

CS	Credibility Support
PIT	Persuasive Intervention Technology
PI	Persuadability Inventory
ANOVA	Analysis of Variance
SEM	Structural Equation Modeling
PLM	Partial Least Squares
CMV	Common Method Variance
VIF	Variance Inflation Factor
STPS	Susceptibility to Persuasive Strategies
TIPI	Ten-Item Personality Inventory
SLR	Systematic Literature Review
PEM	Persuasive Experience Model
UML	Unified Modeling Language
PSP	Pilot System Prototypes
AHP	Analytical Hierarchy Process
WI-FI	Wireless Fidelity
API	Application Programming Interface
HTTP	Hypertext Transfer Protocol
vDOM	Virtual Document Object Model
MVC	Model View Controller
JSX	JavaScript Extension
SQL	Structured Query Language
SPSS	Statistical Package for Social Sciences
UI	User Interface
ANTD	Ant Design
ORM	Object Relational Mapping
SMS	Short Message Service
RM-ANOVA	Repeated Measure Analysis of Variance
ASYMP.	Asymptotic

## ABSTRACT

Persuasive technology is an approach to designing persuasive systems. The ultimate goal of PT is to enable users of persuasive systems to achieve their desired behavior change without any form of coercion. Based on the persuasive system model, persuasive technology has found application in several domains like Health and Wellness, Education, E-commerce, etc with varying degrees of results, etc. but has found a paucity of studies in the domain of religion and religious application. The rate of engagement with some prayer apps in comparison to other religious-based apps like bible study and worship apps is low. Such apps include daily prayer, pray as you go, and prayer mate. The above findings birthed the need for a design that would be persuasive and goal driven. The goals set to be achieved in this study are to identify the most effective persuasive strategies within its principles for the design of a progressive web app to influence strong adherence to prayer behavior, to evaluate the most persuasive strategy through the system use, and the strategy that encourages more engagement. Using Scopus, ScienceDirect, and Google Scholar, works of literature were situated in 54 papers to find dominant strategies incorporated in different domains to select the most relevant ones in building a persuasive system. The selected strategies were used to design a model which was then converted into a functional and credible system. The Persuasive Potential Questionnaire was adopted to evaluate the user's susceptibility to the system. The result shows nine strategies are dominant in the PT domains and that personalization is the most persuasive strategy and that social comparison is the least persuasive. This will help researchers to broaden their scope in this domain to investigate some other strategies that will be relevant in such systems as these which will also help the designer to easily select some strategies already investigated to be persuasive in this context. Lastly, this study will help users in engaging continuously with the system for the desired behavior which will eventually lead to continuity in the desired behavior even without the persuasive system.

***Keywords: Persuasive Technology; PSD Model; Religious Application; Prayer; Progressive Web Application; Wilcoxon Test.***