INFORMATION AND COMMUNICATION TECHNOLOGY (ICT) DEPLOYMENT IN ARCHITECTURAL FIRMS IN NIGERIA

A PhD Thesis

Submitted by

Oladipo Ayodeji **DARE-ABEL**

MAT NO. – CUGP/05/140

Supervisors

PROF. J.M. IGWE

PROF. C.K. AYO

Submitted to the Department of Architecture, Covenant University

In Fulfilment of the Requirements for the

Award of a PhD Degree in

Architecture, Covenant University, Ota,

Ogun State, Nigeria

2013

DECLARATION

I, Dare-Abel Oladipo Ayodeji, declare that this thesis was carried out entirely by me under the supervision of Prof. Joseph Mgboyetugbo Igwe (Supervisor) and Prof. Charles Korede Ayo (Co-Supervisor) of the Department of Architecture, University of Lagos, Akoka, Lagos State and the Department of Computer and Information Studies, Covenant University, Ota, Ogun State respectively. The thesis has not been presented, either wholly or partly, for any degree elsewhere before.

All sources of scholarly information used in this thesis were duly acknowledged.

DARE-ABEL, O. A.

CERTIFICATION

This thesis entitled Information and Communication Technology (ICT) Deployment in Architectural firms in Nigeria carried out by Dare-Abel, Oladipo Ayodeji under my supervision meets the regulations governing the award of the degree of Doctor of Philosophy (PhD) in Architecture of the Covenant University, Ota, Ogun State, Nigeria. I certify that it has not been submitted for the award of PhD or any degree in this or any other university, and is approved for its contribution to knowledge and literary presentation.

---	---
Prof. J. M. Igwe	Prof. C. K. Ayo
Supervisor	Co-Supervisor
---	---
External Examiner	The Head, Department of Architecture

DEDICATION

I dedicate this work to the Lord Jesus Christ who through his Spirit inspired me. He gave me the courage, strength, direction and sustained me throughout the period. I am forever grateful to Him for bringing the right people, resources and success my way.

To Him is all the glory.

ACKNOWLEDGEMENT

Ultimately, I appreciate God Almighty my creator for the gift of life and the path in life that He has given me. This path has given me the opportunity to be at Covenant University with the privilege of embarking on this study. His glorious name is worthy of praised.

My profound gratitude goes to the Chancellor and management of the university who have with the wisdom and inspiration from above created this platform of opportunity. I commend your tireless efforts towards the development of people. I also appreciate the contributions of Prof. E.A. Adeyemi, Prof. Olajide Solanke, Dr. S.A. Daramola and Dr Albert Adeboye who led the department of Architecture during the period of the study.

To my supervisors, your mentorship and guidance have shaped me. Prof. J.M. Igwe, you always believed the study will turn out successful. Your fatherly and encouraging words were stimulating and your doors were always open to help at all times. Prof. C.K. Ayo, I am always amazed at the speed with which you get things done. I keep learning and appreciate the push that you have given to make the study a reality. I am also grateful for the exposure you have given me which has indeed broadened my intellectual horizon. May God bless and crown your efforts.

Dr. Alagbe and Dr. Oluawatayo, you were both sources of encouragement. The initiative and execution of the departmental seminar series spearheaded by both of you is commendable, it shall continue to bear fruit. Dr. (Mrs.) Abioye, Dr. Omogbadegun, Dr. Ibem, Dr. Ekhaese and Dr. Ikhu-Omoregbe, I appreciate your scholarly support and encouragement at all times. Dr. Akinola, Dr. Taiwo, Dr. Aduwo, Dr. Adeokun, Arc. Opoko, Arc. Ezemma, Arc. Babalola, Arc. Uwakonye, Arc. Odum, Arc. Adewale, Arc. Fulani, Arc. Izobo-Martins, Mr. Adegoke, Arc. Ediae, Arc. Alalade and all my colleagues, thank you for contributing and giving support. I also appreciate Dipo Ogunneye, Funso Fasanya, Jesimiel, Adebayo Moses, Chisomebi and Ekoh-Chukwukelu jnr. you were all wonderful research assistants. Arc. Peter Aderonmu, your tireless prayers, encouragement and advice are valuable.

To my wonderful wife, Abimbola, thank you for being there all the way, you counted figures, typed and always prayed for me; your support is priceless. My princess, Ayomide you are wonderful. Canon and Mrs. Oluwole Dare-Abel your investment and love for education shall continue to yield great returns for many generations. To my siblings and Family, Thank you all.

ABSTRACT

Architectural practice has been in existence in Nigeria for more than fifty years and the earliest introduction of computers by firms for operations began in the early 1980s. Information and communication technology (ICT) usage is inevitable in all fields of endeavours and for professionals in the present era. The study of ICT usage and deployment therefore becomes imperative. This study aims at providing an understanding of the deployment of ICT in architectural firms in Nigeria. It specifically examines organizational and ICT characteristics of the firms; the measure of fit between ICT tools deployed and tasks engaged; the effect of training programmes on the availability of ICT proficient personnel; and the level of acceptance of Computer Supported Collaborative Work (CSCW) in architectural firms in Nigeria. The Task-Technology Fit model (TTF) and an Extended Technology Acceptance Model (TAM) were employed to test deployment of four design technologies (AutoCAD, ArchiCAD, Revit Architecture and SketchUp) and the acceptance of CSCW. The multistage sampling technique was used to derive the sample drawn from six cities: Abuja, Kaduna, Maiduguri, Enugu, Lagos and Portharcourt were selected based on documented evidence of having the largest number of firms in their zones. A total of 118 questionnaires were returned from a total of 159 distributed. This represents a 74.21% return rate. The data collected were analysed using descriptive statistics, crosstabulations, Chi-Square tests, exploratory factor analysis, Analysis of Variance (ANOVA) and multiple regression analysis. The study revealed improvements in the quality and availability of ICT systems in architectural firms in Nigeria as from 2001. Internet connectivity and Website ownership is on the increase in architectural firms. Annual turnover of the architectural firms has is positively correlated to the quality of installed systems. The study also found a relationship between ownership of websites and the date of ICT introduction. The integrated TTF/TAM test showed levels of fit between tasks engaged in architectural firms and the design technologies deployed. The model tests explain between 41.4% - 52.1% of the residual variation in the production of detailed system product. The coefficients of determination and beta coefficients are significant to predict model fit of deployment. Reasonable proficiency levels of the staff in the deployment of the available software and technologies were confirmed. Furthermore firms are getting increasingly involved in outsourcing as a service delivery strategy. The study revealed that few firms fund training programmes within their organizations. Most of those that fund training programs commit lower than a million naira to it annually. The study revealed that there is no significant relationship between the availability of CAD/BIM proficient staff and the existence of training programmes within the firms. It was also confirmed that there was no significant relationship between the availability of CAD/BIM proficient staff and the training methods employed by the firms. It was found that there was a significant relationship between the availability of CAD/BIM proficient staff and the CAD/BIM proficient staff needed. The interview responses suggest that the schools of architecture have done much towards achieving the availability of CAD/BIM proficient staff. CSCW has been adopted by only 37.3% of the firms and the study revealed that perceived ease-of-use, security and the quality of installed systems were predictors of the extended TAM model. In conclusion, the study recommends that concerted efforts towards developing network infrastructure especially broadband access can improve the practice of outsourcing and also have impact on CSCW. Quality investment and commitment by technology companies and vendors, firms, the government and other stakeholders in the area of ICT acquisitions, network security and the development of user-friendly technologies will surely improve adoption and deployment of ICT in architectural firms in Nigeria.