

BUSITEMA UNIVERSITY
FACULTY OF ENGINEERING
DEPARTMENT OF COMPUTER ENGINEERING
FINAL YEAR PROJECT REPORT
TITLE: SMART MOBILE EXAMINATION PERMIT SYSTEM
CASE STUDY-BUSITEMA UNIVERSITY

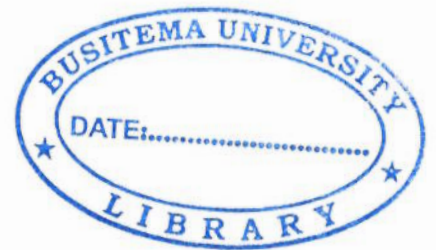
BY:

KISAKYE KENNETH

BU/UP/2014/309

FACULTY SUPERVISOR:

MS. ASINGWIRE BARBARA KABWIGA



Email: kanyecope@gmail.com

[Tel: +256-704736326/+256-776991606](tel:+256-704736326/+256-776991606)

A Final Year Project Report Submitted to the Department of Computer Engineering in Partial
Fulfillment for the Award of Bachelor of Computer Engineering Degree

May 2018

DECLARATION

I **KISAKYE KENNETH**, do hereby declare that this project report is my original work and has never been published and/or submitted for any other degree award to any other university or institution of higher learning.




.....
Kisakye Kenneth

BU/UP/2014/309



APPROVAL

This is to certify that the project report under the title "*smart mobile examination permit system*" has been done under my supervision and is now ready for examination.


.....

MS. ASINGWIRE BARBARA KABWIGA

Date: 6/6/18.....

ACKNOWLEDGEMENT

My Supervisor, Ms. Asingwire Barbara Kabwiga who has continuously guided me throughout this project. My parents for the continued provision, support and encouragement. All my friends who believed in me and continually encouraged me. The almighty God who has made a way when things seemed hard and for providing me with the right people and information even during research.

ABSTRACT

The education landscape is changing, higher education is being reshaped by globalization and the digital revolution. There are growing pressures related to declining sources of income and rising costs. Student enrollment to higher institutions of learning has increased, however university face a challenge of service delivery to search large numbers. Students are issued with various permits like examination cards, to authenticate them to seat for their semester examination, despite improvements in the systems used, there challenges like fraud, impersonation and high operational costs directed towards these permits.

Higher institutions of learning need to invest in digital systems that makes use of current available technologies to help in saving expenditures on stationery like paper and associated costs and verify students who access exam rooms.

LIST OF ACRONYMS

AR	Academic Registrar
CLF	Contactless Front End
ID	Identification
ISO	International Organization for Standardization
IT	Information Technology
Kbps	Kilobytes per second
LAN	Local Area Network
NFC	Near Field Communication
QR	Quick Response
RFID	Radio Frequency Identification
Wi-Fi	Wireless Fidelity

LIST OF FIGURES

Figure 2-2-1 NFC history [8].....	5
Figure 2-2-2: NFC tag [13].....	6
Figure 2-2-3: NFC Mobile architecture [18]	7
Figure 2-2-4: Sample of application using NFC technology [20]	8
Figure 5: System Logic design	18
Figure 6: Physical design	19
Figure 7: Data flow diagram for the system	19
Figure 8: Entity relationship diagram	20

LIST OF TABLES

Table 1: Existing systems and their challenges.....	10
---	----

Table of Contents

DECLARATION	i
APPROVAL	ii
ACKNOWLEDGEMENT	iii
ABSTRACT.....	iv
LIST OF ACRONYMS	v
LIST OF FIGURES	vi
LIST OF TABLES	vii
CHAPTER ONE: INTRODUCTION.....	1
1.1 Background	1
1.2 Problem Statement	2
1.3 Objectives.....	3
1.3.1 General Objective.....	3
1.3.2 Specific Objectives	3
1.4 Significance.....	3
1.5 Project Scope.....	3
CHAPTER TWO: LITERATURE REVIEW.....	4
2.1 Introduction	4
2.2 Key Terms.....	4
2.2.1 Near Field Communication (NFC).....	4
2.2.2 Overview of NFC Tag	6
2.2.3 NFC Smart Phone.....	6
2.2.4 NFC Applications	7
2.3 Related Systems	8

2.3.1 Paper Examination permits.....	8
2.3.3 An examination permit system using the student ID.....	9
Table 1: Existing systems and their challenges.....	10
2.4 System description.....	10
CHAPTER THREE: METHODOLOGY.....	12
3.0 Introduction.....	12
3.1 Data Collection.....	12
3.2 Requirements analysis.....	12
3.2.1 Frame work analysis:.....	12
3.2.2 Entity-Relationship Diagrams (ERD).....	13
3.2.3 Data Flow Diagrams.....	13
3.3 System design.....	14
3.4 Tools and software.....	14
CHAPTER FOUR: SYSTEM ANALYSIS AND DESIGN.....	15
4.0 Introduction.....	15
4.1 Functional analysis.....	15
4.2 Requirements analysis.....	15
4.2.1 Functional requirements.....	15
4.2.2 Non-functional requirements.....	15
4.2.3 User needs and requirements.....	16
4.3 System design.....	16
4.3.1 Logical design of the system.....	16
4.3.2 Physical design.....	19
4.3.3 Data Flow Diagram.....	19

4.3.4 Entity Relations	20
CHAPTER FIVE: IMPLEMENTATION AND TESTING	21
5.0 Introduction	21
5.1 Development platforms	21
5.1.1 Android studio IDE.	21
5.1.2 SQL Server Management Studio (SSMS).....	21
5.1.3 WAMP server.....	21
5.1.4 Sublime Text.....	21
5.2 Code design	21
5.3 Testing	24
5.4 Verification.....	24
5.5 System evaluation	25
CHAPTER SIX: DISCUSSIONS AND RECOMMENDATIONS.....	26
6.1 Introduction	26
6.2 Summary of the work done	26
6.3 Critical Analysis and Comparison with other Systems	26
6.4 Recommendations	26
6.5 Challenges	27
6.6 Conclusions.....	27
References.....	28
APPENDICES	30
APPENDIX 1: Interviews	30

CHAPTER ONE: INTRODUCTION

1.1 Background

The education landscape is changing, higher education is being reshaped by globalization and the digital revolution. There are growing pressures related to declining sources of income and rising costs. There is heightened competition for share of the global student market. Institutions are seeing a lasting effect from the global financial crisis impacting both enrolment numbers and philanthropy, and students have increasing demands and expectations of their educational experience [1].

The Ugandan higher education sub-sector has continued to expand in terms of students enrolment and the number of institutions. These increases, however, have occurred in the face of declining or stagnant unit cost funding for education facilities, infrastructure and academic staff [2]. The state and other stakeholders must address the problem of the funding of tertiary education before standards are compromised [2]. With these ever increasing numbers, the universities face a big challenge of providing quick and quality services like admissions, registration and examination permit issuance to these large numbers in less time and at low operational costs. Students are looking for access to services and education across new technologies and more flexible delivery options. In order to be competitive and to meet these expectations, universities will need to invest in expensive facilities and infrastructure. Some education institutions have developed applications like online registration systems and online examination result display systems. Online registration system provides services for new admission intakes and registration for continuing students so as to limit the operational costs involved, time in queues to acquire forms and permits. However, these institutions have not yet done enough to curb the issue of paper examination permits yet they have shortcoming to the universities. For years, a well-organized racket of fraudsters, working through a network of brokers, have been forging the permits for students. The scam has been causing financial loss to the university [Makerere University] by enabling students to sit for examinations for several semesters without paying tuition [3]. Therefore, this issue of paper permits needs to be tackled since other institutions are likely to suffer the same effect.

References

- [1] M. S. Bryant. (2013, 10th November). *The world beyond 2015 Is higher education ready?* [Higher Education]. Available: <https://beyond2015.acu.ac.uk/submissions/view?id=106>
- [2] N. C. f. H. E. report, "The state of higher education and training in Uganda 2010: A Report on higher education delivery and institutions," ed: NCHE Press Kampala, 2011.
- [3] S. Serwanjja. (2013). *Makerere students lose cash in exam permit scam.* Available: https://www.newvision.co.ug/new_vision/news/1315837/makerere-students-lose-cash-exam-permit-scam
- [4] G. Madlmayr, J. Langer, C. Kantner, and J. Scharinger, "NFC devices: Security and privacy," in *Availability, Reliability and Security, 2008. ARES 08. Third International Conference on*, 2008, pp. 642-647: IEEE.
- [5] M. Rouse. (2003-2017). *Near Field Communication.* Available: <http://searchmobilecomputing.techtarget.com/definition/Near-Field-Communication>
- [6] N. Semiconductors. (2006-2017). *Near Field Communication.* Available: https://www.nxp.com/products/identification-and-security/nfc:MC_71110
- [7] R. Want, "Near field communication," *IEEE Pervasive Computing*, vol. 10, no. 3, pp. 4-7, 2011.
- [8] LSaranzaya. (2016). *NFC History.* Available: https://commons.wikimedia.org/wiki/File:NFC_History
- [9] T. Lerner, *Mobile payment.* Springer, 2013.
- [10] C. L. Joseph, E. Halkiadakis, S. Bernal, and D. Maiullo, *Modern Devices: The Simple Physics of Sophisticated Technology.* John Wiley & Sons, 2016.
- [11] V. Coskun, K. Ok, and B. Ozdenizci, *Near field communication (NFC): From theory to practice.* John Wiley & Sons, 2011.
- [12] J. C. Klensin and M. A. Padlipsky, "Unicode Format for Network Interchange," 2008.
- [13] Bonwal. (2017). *NFC tags.* Available: <http://www.bonwal.fi/en/nfc-tags/>
- [14] M. E. Seligman, *Learned optimism: How to change your mind and your life.* Vintage, 2011.
- [15] J. A. Paradiso and T. Starner, "Energy scavenging for mobile and wireless electronics," *IEEE Pervasive computing*, vol. 4, no. 1, pp. 18-27, 2005.
- [16] M. E. Caceres, Y. L. Li, and M. A. Kamal, "Secure nfc data authentication," ed: Google Patents, 2013.

- [17] T. Huque and O. Van Nieuwenhuyze, "Protection of a communication channel of a telecommunication device coupled to an NFC circuit against misrouting," ed: Google Patents, 2015.
- [18] F. J. Liébana-Cabanillas, F. Muñoz-Leiva, and J. Sánchez-Fernández, "Comparative Study Among New Payment Systems and New Future Trends in Mobile Payments," in *Electronic Payment Systems for Competitive Advantage in E-Commerce*: IGI Global, 2014, pp. 223-259.
- [19] B. Benyo, A. Vilmos, K. Kovacs, and L. Kutor, "NFC applications and business model of the ecosystem," in *Mobile and Wireless Communications Summit, 2007. 16th IST, 2007*, pp. 1-5: IEEE.
- [20] S. Approach. *NFC Applications*. Available: <http://www.smart-approach.com.tw/about.php>
- [21] N. JACINTA. *QR Code Examination Permit Verification System*. Available: <https://qrcodeverification.wordpress.com/team/>
- [22] A. Kolawa and D. Huizinga, "Automated defect prevention: Best practices in software management," *Wiley-IEEE Computer Society Press*, vol. 41, p. 86, 2007.
- [23] A. Geraci *et al.*, *IEEE standard computer dictionary: Compilation of IEEE standard computer glossaries*. IEEE Press, 1991.

