 **ACCRA TECHNICAL UNIVERSITY**

**DESIGN AND IMPLEMENTATION OF COMPUTERIZED ITENARARY (TO-DO-LIST) SYSTEM FOR DEANS (CASE OF ACCRA TECHNICAL UNIVERSITY, ACCRA GHANA)**

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**In**

**COMPUTER SCIENCE**

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# DECLARATION BY STUDENT(S)

This research project is submitted as part of fulfilment for the award of a **Higher National Diploma** in **Computer Science**: The work is a result of our investigation. All sections of the text and results which have been obtained from other works/sources are fully referenced. We understand that cheating and plagiarism constitute a breach of Accra Technical University and will be dealt with accordingly.

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# DEDICATION

We dedicate this project work to God Almighty in heaven for his immense mercies and protection, and all our lecturers for their support and assistance, directing us, throughout our stay in school.

# ACKNOWLEDGEMENT

We are incredibly grateful to God for his blessings and for being able to complete the project. we are very thankful to the almighty GOD who showers His blessing continually on us. We owe a debt of gratitude to Mr. Nartey Felix, our supervisor, who never stopped encouraging and supporting us as we finished this project. It is true that we could not have finished this research without his direction, encouragement, support, and recommendations. He served as our main source of inspiration and direction. And once more, we want to express our gratitude to our Head of Department for his unwavering support and direction during the whole semester.

We would want to sincerely thank our parents, may God bless them, for their guidance and encouraging words. We pray to God Almighty to bless all of our dear friends, well-wishers, and loved ones who have in one way or another made a significant contribution to the success of our projects. We will never forget you.

# ABSTRACT

In academic institutions, deans play a critical role in overseeing a range of administrative and instructional duties. This project proposes the design and implementation of an itinerary system designed to cater to the distinct needs of academic leaders and officers with the goal of improving their daily duties' efficiency and organization in Accra Technical University. The system intends to facilitate communication, expedite task management, and offer a single platform for allocating priorities to tasks.

It is anticipated that the introduction of this computerized itinerary system will have a major positive impact on the productivity and efficacy of administrative duties at these educational establishments. It is consistent with the administrative process modernization movement, which uses technology to improve overall productivity and streamline procedures. Future versions might look into new features and integrations in response to customer feedback and changing technology developments.

The proposed system has user-friendly interfaces using PHP, CSS, APACHE and MySQL, academic leaders with different degrees of technological experience can access it.

# TABLE OF CONTENTS

[DECLARATION BY STUDENT(S) i](#_Toc146624573)

[DECLARATION BY SUPERVISOR ii](#_Toc146624574)

[DEDICATION iii](#_Toc146624575)

[ACKNOWLEDGEMENT iv](#_Toc146624576)

[ABSTRACT v](#_Toc146624577)

[TABLE OF CONTENTS vi](#_Toc146624578)

[LIST OF FIGURES ix](#_Toc146624579)

[LIST OF TABLES ix](#_Toc146624580)

[CHAPTER ONE 1](#_Toc146624581)

[INTRODUCTION 1](#_Toc146624582)

[1.1 BACKGROUND OF THE RESEARCH 1](#_Toc146624583)

[1.2 PROBLEM STATEMENT 2](#_Toc146624584)

[1.3 RESEARCH QUESTIONS 2](#_Toc146624585)

[1.4 OBJECTIVES OF THE STUDY 2](#_Toc146624586)

[1.5 SIGNIFICANCE OF THE STUDY 3](#_Toc146624587)

[1.6 SCOPE AND LIMITATION OF THE STUDY 3](#_Toc146624588)

[1.7 ORGANIZATION OF THE STUDY 3](#_Toc146624589)

[CHAPTER TWO 5](#_Toc146624590)

[LITERATURE REVIEW 5](#_Toc146624591)

[2.0 INTRODUCTION 5](#_Toc146624592)

[2.1 CONCEPT OF ONLINE ADMISSION SYSTEM 5](#_Toc146624593)

[2.2 PURPOSE OF THE ADMISSION SYSTEM 6](#_Toc146624594)

[2.3 THE EXISTING SYSTEM 6](#_Toc146624595)

[2.4 COMPUTERIZED APPROACH TO ONLINE ADMISSION SYSTEM 7](#_Toc146624596)

[2.5 THEORETICAL FRAMEWORK 9](#_Toc146624597)

[2.6 RELATED WORK 11](#_Toc146624598)

[CHAPTER THREE **Error! Bookmark not defined.**](#_Toc146624599)

[RESEARCH METHODOLOGY **Error! Bookmark not defined.**](#_Toc146624600)

[3.0 INTRODUCTION **Error! Bookmark not defined.**](#_Toc146624601)

[3.1 RESEARCH METHODOLOGY **Error! Bookmark not defined.**](#_Toc146624602)

[3.2 POPULATION, SAMPLING TECHNIQUE AND SAMPLE STUDY **Error! Bookmark not defined.**](#_Toc146624603)

[3.4 METHOD OF DATA COLLECTION AND ANALYSIS **Error! Bookmark not defined.**](#_Toc146624604)

[3.5 RESULTS OF THE STUDY **Error! Bookmark not defined.**](#_Toc146624605)

[The study's findings are presented in the section below using descriptive statistics frequencies. **Error! Bookmark not defined.**](#_Toc146624606)

[3.5 GENERAL ANALYSIS OF THE EXISTING SYSTEM **Error! Bookmark not defined.**](#_Toc146624607)

[3.5 JUSTIFICATION FOR THE NEW SYSTEM **Error! Bookmark not defined.**](#_Toc146624608)

[3.6 RESEARCH DISCUSSION **Error! Bookmark not defined.**](#_Toc146624609)

[3.7 BUILD APPROACH **Error! Bookmark not defined.**](#_Toc146624610)

[3.7.2 The Sequential Phases in the Waterfall Model Are **Error! Bookmark not defined.**](#_Toc146624611)

[3.8 JUSTIFICATION **Error! Bookmark not defined.**](#_Toc146624612)

[CHAPTER FOUR **Error! Bookmark not defined.**](#_Toc146624613)

[THE RESULTS – RESEARCH OUTPUT/PRODUCT **Error! Bookmark not defined.**](#_Toc146624614)

[4.0 INTRODUCTION **Error! Bookmark not defined.**](#_Toc146624615)

[4.1 DESIGN IMPLEMENTATION TOOLS **Error! Bookmark not defined.**](#_Toc146624616)

[4.2 REQUIREMENTS ANALYSIS **Error! Bookmark not defined.**](#_Toc146624617)

[ The system should be able to create reports on user admissions. **Error! Bookmark not defined.**](#_Toc146624618)

[4.3 DATABASE IMPLEMENTATION **Error! Bookmark not defined.**](#_Toc146624619)

[4.4 SYSTEM DESIGN **Error! Bookmark not defined.**](#_Toc146624620)

[4.8 SYSTEM ARCHITECTURE **Error! Bookmark not defined.**](#_Toc146624621)

[CHAPTER FIVE **Error! Bookmark not defined.**](#_Toc146624622)

[SUMMARY, CONCLUSION AND RECOMMENDATIONS **Error! Bookmark not defined.**](#_Toc146624623)

[5.0 INTRODUCTION **Error! Bookmark not defined.**](#_Toc146624624)

[5.1 SUMMARY **Error! Bookmark not defined.**](#_Toc146624625)

[5.2 CONCLUSION **Error! Bookmark not defined.**](#_Toc146624626)

[5.3 RECOMMENDATION **Error! Bookmark not defined.**](#_Toc146624627)

[REFERENCES **Error! Bookmark not defined.**](#_Toc146624628)

[APPENDIX A **Error! Bookmark not defined.**](#_Toc146624629)

[APPENDIX B **Error! Bookmark not defined.**](#_Toc146624630)

[4.1 DATA ANALYSIS **Error! Bookmark not defined.**](#_Toc146624631)

[OBSERVATIONS **Error! Bookmark not defined.**](#_Toc146624632)

# LIST OF FIGURES

[Figure 2.1: Acceptance Model (Tam) 10](#_Toc145098096)

[Figure 2.2: Source: Diffusion-of-Innovation-Theory-DOI-Rogers-2003 10](#_Toc145098097)

# LIST OF TABLES

# CHAPTER ONE

# INTRODUCTION

## 1.1 BACKGROUND OF THE RESEARCH

The increasing complexity of administrative responsibilities at Accra Technical University is driving research into the design and deployment of a computerized itinerary (to-do-list) system for academic leaders, including deans, heads of departments, and senior officers. With the expansion of Accra Technical University's academic duties to include faculty coordination, curriculum creation, and strategic planning, among other various tasks, there is a growing demand for a more effective and structured approach to task management. Accra Technical University's collaborative approach to academic leadership highlights the need for a centralized infrastructure that enables effective information sharing by facilitating smooth coordination and communication among stakeholders. This project, which aims to automate repetitive procedures and improve overall efficiency, is in line with the larger trend of technological developments in school administration.

Chen et al. (2018) and Wang and Lee (2019) conducted prior research that examined the use of work management systems in higher education. These studies highlight how centralized systems improve teamwork and productivity. Systems that can support academic leaders' unique workflows and goals are, nevertheless, clearly needed.

Since each leadership position at the university has own processes and priorities, the system is made to be flexible and customizable to meet the particular requirements of Accra Technical University's administrative environment.

The research by Kim and Park (2018) and Garcia et al. (2020) makes clear the necessity of customisation and flexibility in technology adoption. According to these studies, technology solutions that are customized to meet the particular requirements of users and organizations have a higher chance of being accepted and used successfully.

In Accra Technical University's dynamic academic environment, having real-time access to updated task lists, deadlines, and collaborative projects is essential for making well-informed decisions. Strict security protocols are also included to guarantee the integrity and confidentiality of private academic and administrative data that is unique to Accra Technical University. The overall goal of the project is to offer Accra Technical University a customized solution that improves decision-making, efficiency, and teamwork within its changing administrative structure.

## 1.2 PROBLEM STATEMENT

Accra Technical University's problem-solving statement for designing and implementing a computerized itinerary system for academic leaders’ centres on the need for a more effective and structured approach to task management given the increasing complexity of administrative activities. There is an obvious void in the current task management procedures as the institution expands and broadens its scope of academic duties, which include faculty coordination, curriculum creation, and strategic planning. The collaborative character of academic leadership at Accra Technical University necessitates smooth coordination and communication between stakeholders, but the procedures in place might not be sufficient to meet this need.

Furthermore, the lack of a customized, technologically advanced solution makes it more difficult to automate and optimize repetitive processes, which reduces total productivity. The difficulty is made worse by the absence of a centralized system that enables flexibility and modification to the unique goals and processes of academic leaders at Accra Technical University. There is currently no specialized digital solution that facilitates the real-time access to updated task lists, deadlines, and collaborative projects—all of which are essential for making informed decisions. By addressing these problems, Accra Technical University's dynamic administrative environment will be more productive, collaborative, and decision-making friendly.

## 1.3 RESEARCH QUESTIONS

In order to achieve the goals of the study, the following questions were asked:

* What is the current means Itinerary (to-do-list) at Accra Technical University?
* What are the issues related with Accra Technical University’s current Itinerary(to-do-list) system?
* What Initiatives need to be made to improve and computerize Accra Technical University Itinerary system (to-do-list) for the students?

## 1.4 OBJECTIVES OF THE STUDY

The study will accomplish the following objectives:

* To handle Itinerary(to-do-list) in an efficient and effective manner, to offer a trustworthy, open system free from bias and personal interests.
* To provide for unrestricted access and ensure prompt Itinerary(to-do-list).
* To reduce the hassles and anxiety associated with traveling and waiting in line to deliver Itinerary(to-do-list) taking.

## 1.5 SIGNIFICANCE OF THE STUDY

The study's significance stems from its potential to improve Accra Technical University's administrative domain's efficiency, collaboration, and decision-making in a concrete way. This would increase the university's overall effectiveness and establish it as a technologically advanced institution. The study holds several key implications:

* It is quite time-saving.
* You can use it from your office, bedroom, or anyplace else in the world with great convenience.
* Delays in information processing can be avoided and happen very quickly.
* Improved Cooperation and Exchange of Information
* Guaranteed security and confidentiality

1.6 SCOPE AND LIMITATION OF THE STUDY

The scope and limitations of an online itinerary (to-do list) system for Accra Technical University are defined as follows:

Scope:

The Itinerary(to-do-list) system for Accra Technical Universityis the sole focus of this research project. The software will be constructed utilizing Java and firebase to administer the database and enable online functionality.

Limitations:

This research uses Accra Technical University as a case study to examine every facet of the online clearance procedure. But the limitations were as follows:

* Time restrictions: Owing to scheduling constraints, the online mobile Itinerary (to-do-list) system is created for several departments.
* Financial limitations: Developing a comprehensive online mobile Itinerary (to-do-list) system would be quite expensive.

## 1.7 ORGANIZATION OF THE STUDY

There are five chapters to complete the entire research endeavour. A summary of the information covered in each chapter may be found below:

* **Chapter One- Introduction:** An overview of the research, its historical background, the problem statement, the research questions, the study's objectives, significance, scope, constraints, and organizational structure are all included in this chapter.
* **Chapter Two- Literature Review**: The research's significance is reviewed in this chapter. The school's online itinerary system's underlying theories and modeling are listed and discussed.
* **Chapter Three- Methodology**: The research methodology highlights the research paradigms and techniques while also explaining the process. The chosen sample size and the sampling process are both explained. the instrument(s) and method(s) used for data collection, analysis, and presentation.
* **Chapter Four- Proposed System and Implementation**: This chapter outlines the steps required to create and develop the proposed system as well as the procedures for putting it into practice.
* **Chapter Five -Conclusion and recommendations**: This chapter outlines the steps required to create and develop the proposed system as well as the procedures for putting it into practice. This chapter summarizes the study effort and offers recommendations for the future.

# CHAPTER TWO

# LITERATURE REVIEW

## 2.0 INTRODUCTION

In this chapter, we went into more detail about the literature review and associated works in this chapter.

This chapter summarizes the literature that has been studied by other academics. It includes some of the current system’s strengths and limitations, as well as related studies, and lastly, the suggested system.

The sections of this chapter are: the concept of the admission system; the purpose of the online clearance system; the existing system; the challenges of the existing system; the benefits of the existing system; the computerized approach to the online clearance system; the benefits of the online admission system; and the challenges in the online clearance systems. Theoretical Framework and Related Work are also included.

## 2.1 CONCEPT OF ONLINE ITINERARY SYSTEM

The literature emphasizes the variety of difficulties academic leaders’ encounter. Studies by Jones et al. (2017) and Taylor (2020) show that academic leaders frequently struggle with juggling a variety of tasks, a heavy workload, and the requirement for smooth teamwork. These difficulties emphasize the need for specialized digital tools to improve task management.

Accra Technical University's computerized itinerary system for academic leaders was designed and put into operation after a thorough review of the body of research in the domains of administrative management, information systems, and educational technology. This study of the literature aims to give users a basis for understanding the state of digital task management tools at the moment, the unique difficulties faced by academic leaders, and the possible advantages of using an itinerary management system in a higher education setting.

A major topic of discussion in recent literature has been the incorporation of instructional technology into administrative procedures. According to Johnson and Adams (2018), organizations that use technology for administrative duties report higher productivity and better communication. Smith and Brown's (2019) study highlight how crucial customizable options and user-friendly interfaces are to the uptake of technology in academic contexts.

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## 2.2 PURPOSE OF THE ONLINE ITINERARY SYSTEM

Accra Technical University's online itinerary system was created with academic leaders in mind with the goal of improving and streamlining task management, communication, and teamwork in the administrative setting. With the following primary goals in mind, this system attempts to give a centralized platform customized to the particular requirements of deans, heads of departments, and important officers. The system also prioritizes data analytics for well-informed decision-making, security, regulatory compliance, and system integration. Its overall goal is to develop a secure, effective, and user-friendly procedure for getting clearances in a variety of settings.

## 2.3 THE EXISTING SYSTEM

In most Educational institutions today, Itinerary is manually entered in stationeries. It is time-consuming to maintain separate records for Itinerary. It is necessary to update and refer to all of these documents. More manual mistakes could occur.

### 2.3.1 CHALLENGES OF EXISTING SYSTEM

* Require considerable labour i.e., much effort, much cost, and hard to manage and maintain.
* Since all the task is writing on papers it is very hard to retrieve a particular record when it is required.
* Activities in the manual process are time-consuming and stressful.
* The experience of loss of data and data redundancy in some cases.

### 2.3.2 BENEFITS OF THE EXISTING SYSTEM

* Many people are often familiar with the manual system.
* There is no need for specialized IT infrastructure to access manual itineraries.
* With a handwritten itinerary, there's no need to wait for load delays or system login.
* There is no need to wait for system login or load times with a manual itinerary
* Manual systems are less prone to technical issues, software bugs, or downtime.

## 2.4 COMPUTERIZED APPROACH TO ONLINE ITINERARY SYSTEM

Accra Technical University's computerized solution to the online itinerary system for academic leaders consists of a centralized digital platform with an intuitive user interface that facilitates personalization and modification (Smith & Brown, 2019). Processes are streamlined by automated task management tools, which also offer timely notifications and reminders (Chen et al., 2018). Real-time systems for itinerary sharing promote collaboration by enhancing coordination and communication (Johnson & Adams, 2018). Academic leaders can make well-informed decisions by utilizing real-time data insights provided by analytics solutions (Wang & Lee, 2019). Integration of calendars guarantees a thorough picture of work in addition to other obligations (Kim & Park, 2018). Strong security protocols ensure that private data stays private (Brown & Williams, 2016). Future growth is dependent on scalability and adaptability (Garcia et al., 2020). Adoption success is influenced by thorough training and continuous assistance (Taylor, 2020). The goal of this contemporary strategy is to improve academic leadership decision-making, efficiency, and teamwork.

According to Agbo-Ajala & Makinde (2015) Given the mountainous requirements, there seems to be a trend toward online solutions for schedule flexibility and the daily emergency of communication technologies and capacities.

In conclusion, a computerized approach to an online clearance system is an effective, time- and money-saving option for educational institutions to manage their task purposes. Institutions may enhance productivity, streamline the itinerary process, and give Administration a seamless experience by investing in a dependable clearance software solution.

### 2.4.1 CHALLENGES IN ONLINE MOBILE ITINERARY SYSTEMS

Technology availability alone does not guarantee that people will use it, according to Minghetti & Buhalis (2010). Even with widespread access to technology, many people struggle for a number of reasons to use it effectively. Among them are:

* **Technical Issues**: Online itinerary systems may experience technical problems like as slow load times, server failures, or security breaches.
* **Cost**: An online itinerary system can be costly to set up, especially for smaller universities. Funds must be set aside by institutions for the system's creation, execution, and upkeep.
* **Accessibility**: It may be difficult for certain users to complete the online itinerary process because they do not have access to a computer or the internet.
* **Data Security**: Online Itinerary systems require users to input sensitive personal information such as their name, address, and phone number. Institutions need to ensure that user privacy is maintained and that their online itinerary process is safe and secure.

### 2.4.2 BENEFITS OF THE ONLINE MOBILE ITINERARY SYSTEM

* Time-saving: The online Itinerary system approach saves time by eliminating the need for users to visit the stationery before creating a task.
* Efficient: The online Itinerary system expedites the processing of applications and lessens the administrative officers' workload.
* Convenience: Using the online itinerary system, users can update their plans from anywhere at any time. They don't need to go buy any stationery in order to update their list.
* Accuracy of data: Using an online itinerary system can improve data collection accuracy and lower errors in the to-do list process.
* Secure: The online Itinerary system is safe since important user data is shielded by encryption, which also keeps unwanted access from happening.

# 2.5 THEORETICAL FRAMEWORK

To properly execute the online Itinerary system procedure, users and institutions alike must be familiar with and comfortable with technology. On the other hand, selecting a workable framework that takes technology acceptance ideas and philosophies into account is challenging. Two examples of theoretical frameworks are the Diffusion of Innovation Theory (DOI) and the Technology Acceptance Model (TAM).

### 2.5.1 TECHNOLOGY ACCEPTANCE MODEL (TAM)

Information systems research has utilized the TAM framework extensively since Davis initially introduced it in 1989. According to TAM, a person's willingness to adopt technology depends on how easy and helpful they perceive it to be (Davis, 1989).

According to Eti (2018), the Technology Acceptance Model (TAM) is a theory that describes how people accept and make use of technological advancements. PU and PEOU, or perceived usefulness and ease of use, are the two main theoretical constructs in the TAM.

The Technology Acceptance Model (TAM) has previously been applied to a number of user adoption studies in the fields of healthcare, the internet, and mobile banking (Abbas et al., 2018, Munoz-Leiva et al., 2017), among others. Furthermore, most Technology Acceptance Models originated and were embraced in Western nations, especially in Europe and Latin America (Al-Adwan & Smedley, 2013).

"People set intentions towards behaviors they think would improve their job performance within organizational settings, regardless of any positive or negative feelings they may have towards the behavior itself," the study states. Consequently, PU is directly impacted by PEOU (Eti, 2018; Venkatesh & Davis, 2000).

The figure below illustrates the connection between the TAM's component parts. This implies that attitudes toward technology use are influenced by both PU and PEOU. PU also affects the user's intention or usage pattern when using technology.

Perceived

usefulness

Actual System

use

Behavioural intention to use

Source: Davis et. al, (1989), Venkatesh et. al (2003)

Perceived Ease of use

Figure 2.1: Acceptance Model (Tam)

### 2.5.2 DIFFUSION OF INNOVATION THEORY (DOI)

Rogers first put up the concept of DOI in 1962, which describes how innovations and new ideas propagate across society. According to this hypothesis, early adopters of an online admission system are likely to be the first to accept it, and as the system's advantages become more obvious, a broader group of users will probably follow (Rogers, 1962).

The diffusion of innovations and new ideas throughout society is explained by DOI. According to this hypothesis, early adopters of an online admission system are likely to be the first to accept it, and as the system's advantages become more obvious, a broader group of users will probably follow.

**Figure 2.2: Shows the components of the Diffusion of Innovation Theory (DOI)**

Compatibility

Relative Advantage

Complexity

Rate of

Adoption

Trialability

Observability

Figure 2.2: Source: Diffusion-of-Innovation-Theory-DOI-Rogers-2003

## 2.6 RELATED WORK

**Here are some related works on online admission systems:**

In 2017, Zhang et al. suggested a cloud-based Itinerary Management System for Travelerssystem. A traveller-specific cloud-based itinerary management system is presented in this study. It probably talks about elements that improve the travel experience, like real-time updates, cloud storage for itinerary data, and accessibility from several devices.

Development of a Mobile Itinerary Planning Application with Social Integration, Kin et al, (2016).A system Focusing on mobile platforms, this work explores the development of a mobile itinerary planning application. Social integration suggests features that enable users to share and collaborate on travel plans, potentially leveraging social networks.

Chen et al, (2019), An Intelligent Itinerary Planning System Using Genetic Algorithms. This study presents a genetic algorithm-based intelligent itinerary planning system. It is possible that genetic algorithms will be used to optimize itinerary solutions according to user limits and preferences, providing a novel method of planning.

Design and Implementation of a Web-Based Itinerary System for Academic Conferences Wu et al, (2015). This work addresses web-based itinerary system design and implementation with a focus on academic conferences. It might include functions designed specifically for participation management, collaborative planning among attendees, and conference agendas.

Liu et al, (2018), Mobile Itinerary Management: A Location-Based Approach. This work investigates a location-based service-focused mobile itinerary management system. It might go over how context-aware recommendations and alerts, for example, improve user experience when location data is used.

Development of an Itinerary Recommendation System Using Machine Learning Li et al, (2020). The goal of this research is to create a machine learning-powered itinerary recommendation system. It probably explores how user preferences and past data are analysed by machine learning algorithms to provide individualized trip recommendations.

# CHAPTER THREE

# RESEARCH METHODOLOGY

## 3.0 **INTRODUCTION**

This section provides an overview of our research's methodology and data collection plan. The chapter comprises of i) data collection instruments ii) population and study area iii) sample size and iv) results and analysis.

## 3.1 DATA COLLECTION INSTRUMENTS

This study implemented a mixed Computer Science research methods comprising of Quantitative and Build Computer Science methodologies. The Quantitative method is for collecting data and the Build Computer Science research method is for developing a computerized software solution. The Accra Technical University's deans, department heads, and key officers are all involved in the study. We employed the quantitative research approach to assess the suitability of a computerized software solution system for the aforementioned stakeholders, taking into account factors such as population and meeting schedule.

We employed a quantitative approach to ascertain the efficacy of deploying an automated mobile itinerary system, which entails distributing survey questionnaires via an online Google Form to a predetermined sample size. The optimum tools, approaches, and methods to use in creating an extensive mobile itinerary system for Accra Technical University officials will subsequently be determined by analyzing this data.

## 3.2 POLUATION AND STUDY AREA

Students and lecturers of Accra Technical University Computer Science Department were the subjects involved in our study. The computer science department has three High National Diploma (HND) levels, namely: levels 100, 200 and 300. Each level is also sub-divided into morning or full-time and evening also known as part-time. The morning category is also further divided into three classes for all level labelled as CPS A, CPS B and CPS C. The research involves participants from all levels. As a result, a total target population 1,203 students were established. An online survey was sent to students of each class.

## 3.3 SAMPLE SIZE

To ensure the validity and reliability of our sample size of respondents, we employed a widely used mathematical equation from Kothari (2004), as shown in the following equation.

(1)

Where n is size of sample, *N* is the size of population, *Z* is the standard variate at a given confidence level, *e* is the acceptable error (the precision) and *p* is the probability success, *q* = 1 – *p*. As a result, we employed (1) to obtain our estimated sample size (*n*). In order to calculate *n*, we used the following values in (1): *Z* = 1.96, *p* = 5% (0.05), *q* = 1 – 0.05 = 0.95, *N* = 1203, and *e* = 0.02. Equation (2) illustrates this calculation:

(2)

As calculated in the above equation, our computed sample size was 330.95 (*n* = 330.95). For the analysis to be effective, we had to receive responses close to 330.95 or more. Regarding the sample size, we received 318 responses for effective data analysis as shown in the tabulated results below. Results of our data analysis are presented below in descriptive statistics and percentages.

## 3.4 RESULTS AND ANALYSIS

The section below presents the results of the study using descriptive inferences and statistics. Microsoft excel was used to analyze the data. Analytical data in descriptive statistics of our responses are tabulated below.

### 3.4.1 Demography and Profile of the Respondent

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