

**DESIGN AND IMPLEMENTATION OF AN INFORMATION SYSTEM FOR A  
TRANSPORT COMPANY**

**USING VISUAL BASIC AND MICROSOFT ACCESS 2003**

**CASE STUDY: UGANDA TAXI OPERATORS AND DRIVER'S ASSOCIATION  
(UTODA)**

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**A PROJECT PROPOSAL SUBMITTED TO THE SCHOOL OF COMPUTER  
STUDIES IN PARTIAL FULFILLMENT FOR THE AWARD OF A DIPLOMA IN  
COMPUTER SCIENCE OF KAMPALA INTERNATIONAL UNIVERSITY.**

**AUGUST 2009**


## DECLARATION

We FAZIL ABDULRAHMAN IBRAHIM and NUWAKUUMA JOSEPH declare that this our original piece of work and to the best of our knowledge, it has not been submitted for any other academic award or published at any institution of higher learning other than Kampala International University.

SIGNATURE

  
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**SUPERVISOR**

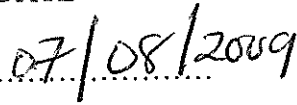
This research proposal entitled "Transport Information System" was conducted and written under my supervision

SUPERVISOR Miss ONKANGI

SIGNATURE

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DATE

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## DEDICATION

We dedicate our research proposal to our parents and supervisor miss Onkangi .

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## ACKNOWLEDGEMENT

We wish to extend our sincere gratitude and acknowledgement of the support, encouragement and respective initiatives of those individuals who facilitated the completion of this project through the provision of a most suitable and supportive working environment.

A special thanks go to our supervisor for the initiative nature, hopeful reassurance, providing us with the knowledge and motivation that drove us through this project.

Many more thanks go to our parents who have stood by us and accomplished the obligation that every good parent must do. We will always be proud, you raised us up to this level and we now owe it to you.

Last but not least, we would like to take this opportunity to thank the entire Uganda Taxi Operators and Drivers Association (UTODA) staff for whatever effort they put in to contribute to the success of this project.

## ACRONYMS

<b>TIS</b>	- Transport Information System.
<b>UTODA</b>	- Uganda Taxi Operators and Driver's Association.
<b>DBMS</b>	- A Database Management System.
<b>DB</b>	- DataBase.
<b>IT</b>	-Information Technology.
<b>IS</b>	-Information System.
<b>MIS</b>	- Management Information System.
<b>TPS</b>	-Transaction Processing System.
<b>MIS</b>	-Management Information System.
<b>DSS</b>	-Decision Support System or <b>EIS</b> -Expert Information System.
<b>OA</b>	-Office Automation.
<b>EIS</b>	- Executive Information System.
<b>VB</b>	-Visual Basic.

## ABSTRACT

This Uganda Taxi Operators and Drivers Association (UTODA) database is developed to show the efficiency of the company to the employees or staff. It's again developed with an aim of enhancing its activities such as file management. The database is involved in access of vital information about the company. Compilation of views from users who get access to use it and this facilitates the decision making process. Hence increasing chances of donors to facilitate the company.

Transport Information System is software that can be used to keep track of the information that is used in a company. A TIS is used to supports accessing the previous reports, payments of any individual, search for employee's data like name and other properties etc.

In most companies UTODA inclusive, there is increasing complexity and uncertainty, the crucial task for companies, is to improve data storage and customer satisfaction by provision of high quality data and service in the most reliable way. At UTODA, there are reports of poor storage of data, a lot of data redundancy, lack of data integrity, high cost of data maintenance, and higher rate of data dependency and deteriorating data management capability. The cause of this situation has not been exposed, which makes the current study a necessity.

Based on the problem stated, the researchers will design and implement a data management system for UTODA in order to solve the current problems.

The main objective is to develop and implement a Transport Information System to allow data accessibility and sharing of resources in order to reduce the cost of operation that is currently faced by UTODA Company.

By the end of the study, UTODA will be able to operate a fast and efficient database and hence enjoy the benefits of using a computerized database system which include; reduced cost of operation hence more profits, ability to print better reports, reduced data redundancy, increased data accessibility and sharing.



After data have been collected, it will be tabulated using Excel to make it easy for the analyst to analyze and interpret it and come up with the system requirements for the Transport Information System.

Recommendation:

The company will buy a standby generator which will prevent information from being lost, since power affects the system.

Conclusion:

There is truly need to implement the new system because of its related advantages to users of the system and company at large. Implementation of the system will not be easy because of the expenses that will be incurred by the company in purchasing the system requirements and specification for efficiency.

The information System also help in provision of employment to people who have knowledge of Information Systems or computer in general which is very helpful to the general public, to some extent it creates more employment opportunities in Uganda thus will encourage the development of Information Technology in the country hence develop the society.

When tax defaulters will be tracked down, there will be no need for law enforcement officers to stand on roads and waste passenger's time asking for previous receipts from drivers.

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## CHAPTER ONE

### INTRODUCTION

#### 1.0 General Introduction

This chapter explains the Transport Information System by giving an overview of how UTODA carries out its day to day activities, pointing out the problems arise from using the current systems. Major emphasis will be placed on the following sections; background of the case study, statement of the problem, objectives of the study, research questions, scope of the study, significance of the study, justification of the study and conceptual frame work of the system.

The researchers begin by defining the key words;

A database is a collection of logically related data about a given company with an aim of easy data accessibility, reduced data redundancy, improved data integrity and security. A system is simply an interconnection of several components which together perform a specific task.

A Database management system (DBMS) refers to the software that provides authorized and concurrency access to data that has been organized in logically coherent groups. The objectives of a database are made possible by means of software known as a DBMS. A DBMS is software that enables a database programmer to create and manage a database for the company. It is composed of two main components; the data manipulation language and the data definition language. The latter is used to define the structure of the database and the former is used to manipulate data i.e. to add and retrieve data.

Transport Information System is software that can be used to keep track of the information that is used in a company. A TIS is used to supports accessing the previous reports, payments of any individual, search for employee's data like name and other properties.

Therefore, a Transport Information System (TIS) is simply a database that is interconnected with other components to provide a specific service to companies like transportation company (UTODA).

A database management system is one of the most important branches of information technology that allows sharing of information.

UTODA company inclusive still use the traditional way of storing data that comes with most of the disadvantages of using paper work. Due to Traditional data management systems which comes with problems like data redundancy, decreased access, less security. The researchers will therefore design and implement a database based on computer technology for UTODA as the backbone of an Information System so that it can eliminate the current problems.

### **1.1 Background of the study**

Uganda Taxi Operators and Drivers Association (UTODA) is a company that manages the transportation of passengers and their property on the roads of Uganda as a service provider.

This company started in 1990. The company manages both new and old taxi parks and all the stages around Uganda, and its main branch located on Ben Kiwanuka Street. The company leadership ranks from the chairman up to the conductors as viewed in the hierarchy on one of the pages.

When a client comes to settle the dues, the receptionist checks whether the client already has a file or not. If a client already has a file, it is re-used else a new file is opened. The files are stored in a file cupboards and this makes it some times hard for the receptionist to search for a specific file from a heap of files. In addition to that, there's need to properly store data concerning payers and the staff members Therefore the researchers aims at designing a computerized database system to help solve the current problems.

## **1.2 Statement of the problem**

In most companies UTODA inclusive, there is increasing complexity and uncertainty, the crucial task for companies, is to improve data storage and customer satisfaction by provision of high quality data and service in the most reliable way. At UTODA, there are reports of poor storage of data, a lot of data redundancy, lack of data integrity, high cost of data maintenance, and higher rate of data dependency and deteriorating data management capability. The cause of this situation has not been exposed, which makes the current study a necessity.

Based on the problem stated, the researchers will design and implement a data management system for UTODA in order to solve the current problems.

## **1.3 Project Objectives.**

### **1.3.1 Main objectives**

The main objective is to develop and implement a Transport Information System to allow data accessibility and sharing of resources in order to reduce the cost of operation that is currently faced by UTODA Company.

### **1.3.2 Specific objectives**

1. To investigate the current problems that a raise from the system.
2. To assess the role of shared data management systems integrated with a TIS on data security in companies and in particular at UTODA.
3. To design a system that will store the company's data and allow fast data access and manipulation
4. To implement and test the system.

## **1.4 Research Questions**

1. What are the roles of a database system on data security at UTODA?
2. How will a database system affect the integrity at UTODA?
3. What are the roles of database systems on reduced data redundancy and cost of storage of data at UTODA?

4. How will a database system affect the efficiency of the services that the companies offer to its clients, users?
5. What are the problems that a raise from the current system.

### **1.5 Scope of the study**

The study will cover the design and implementation of database system for UTODA. It will cover the techniques and methodology necessary to design and implement. This will involve trying to understand various design techniques and programming languages and various DBMS that can be used in developing a database system for any company. To get the data that will be stored in the database, the Specific areas of study will be; the office at the transportation company. With the aim of understanding the data that will be stored about payments, reports, staff members to understand the data that will be stored on staff members and other companies that might want to interact with UTODA.

### **1.6 Significance of the study**

By the end of the study, UTODA will be able to operate a fast and efficient database and hence enjoy the benefits of using a computerized database system which include; reduced cost of operation hence more profits, ability to print better reports, reduced data redundancy, increased data accessibility and sharing.

### **1.7 Justification of the study**

This study project will address problems like; redundancy, insecurity, high cost of operation and a lot of time will be saved.

The study will demonstrate the applicability of Information Technology in companies and possibly replace the often slow and expensive human labor.

The beneficiaries of this research will be the company, the clients and the researchers who have applied their theoretical knowledge into a practical application.

Finally, as a requirement for the researchers to finish the course, this study is justifiable.



## 1.7 Conceptual frame work.

Company Administrator

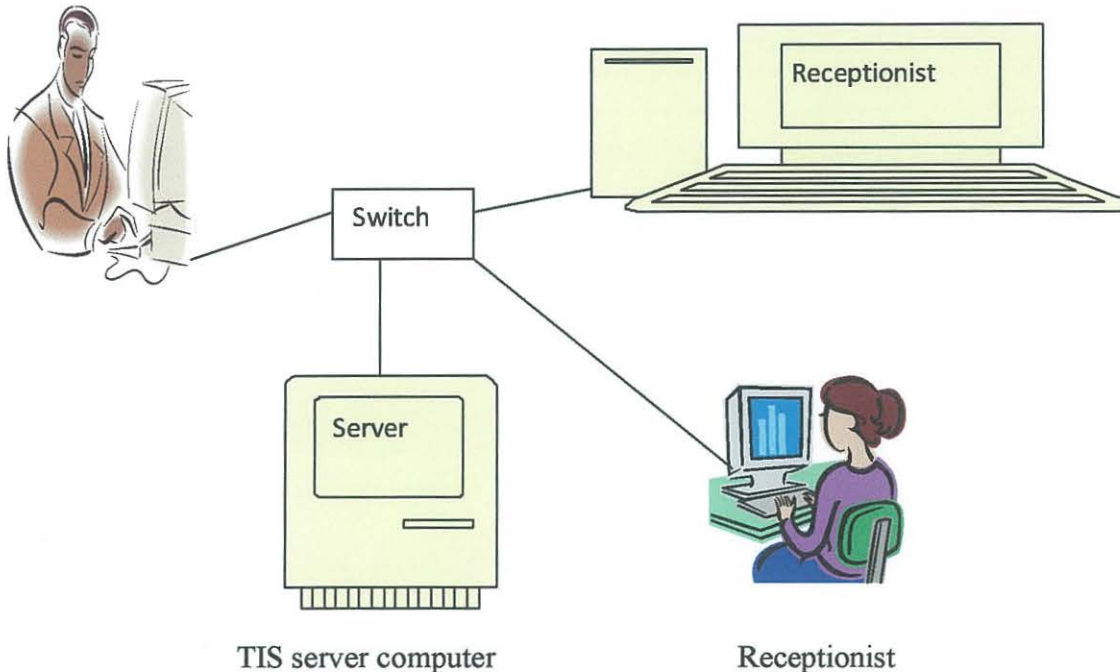


Figure 1: Conceptual frame work for the new system.

The TIS will look like the skeletal view of figure 1. The new system will have three computers all connected to the system database. The receptionist or administrator will be concerned with receiving or entering of information, the client will be requested to provide the identification card. If the client has one, the identification number will be read off the card and entered into the system to search for the previous records.

Then the record will be updated before any transaction is done. On the occasion that the client does not bear a card, he will be asked to pay a registration fee after which the client will be given a card that bears an identification number that will uniquely identify the client in the system. Either way, after the record has been entered, it will go to the database that will be installed on the server.

The cashier will be in charge of entering payment information as the transaction is done. This information will as well be transferred to the database on the server. The database will in addition allow its users to query it for information as will be required.

The administrator will be in charge of storing staff details as they are given appointments and when they report for duty on daily basis. Centralized database will allow data to be shared by the whole company

## CHAPTER TWO

### LITERATURE REVIEW

#### 2.0 Introduction

The aim of this chapter is to explain the concept of a database system (TIS). Its purpose is to find out and suggest procedures that can be used to design and implement a Transport Information System. The information in this chapter, has been gathered from published database system books, internet and previously published. It explains the scope of the literature provided, a DBMS, benefits of using a database system which is the major component of a Transport Information System, areas of application, design tools.

#### 2.1 Scope of the literature review

This literature is concerned with the methodology, techniques that can be used to a database system which is the major backbone of the proposed Transport Information System. The database is the resource for all computer based information systems. A database, "Is a collection of files that are in some way logically related so that data redundancy is minimized" (Long, 1989, p.249). Connolly T. Begg C. (2002) defines Data management as; the storage, retrieval, and manipulation of data to be used by the company. Many existing information systems were designed using traditional approaches to data management but the trend has shifted to the use of database approach to develop new information systems.

TIS cover how a client/server network can be set up to allow the sharing of data in the database via the network It suggests the different areas where systems related to a Transport Information System can be applied. The review further highlights on the different techniques that ca be used in collection of data, analysis, system design, and implementation. Finally it looks at different development tools such as; different operating systems, programming languages, DBMS, that were found useful in the course of the study.

## **2.2 Database systems**

The database is the resource for all computer based information systems. A database, “Is a collection of files that are in some way logically related so that data redundancy is minimized” (Long, 1989, p.249).

More efficient software development and programming techniques are more readily available and data are independent of the application programmes.

### **2.2.1 Long (2002) and Timothy & Linda (2000-2001) gives advantages of using databases**

1. The use of databases leads to reduced data redundancy; in file management systems, some of the same data files are repeated in different files; in databases, by contrast the information appears just once but information is made available to different users moreover concurrently and this lowers down the expenses of space.
2. It also brings about improved data integrity; reduced redundancy increases the chances of data integrity. Data that is accurate, consistent, and up to date because each updating change is made in only one place.
3. More programs independent from the database; this is because the program and file formats are the same, so that one programmer or even several of them can spend less time maintaining files.
4. There is increased user productivity; Database management systems are fairly easy to use, so that users can get their requests for information answered without having to resort to technical manipulations.
5. Finally security is improved compared to when bare work is used; although various departments may share data in common, but access to specific data information can be limited to selected users. Thus, through the use of passwords, an employee’s financial, medical, and private information in a company or an company is made available only to those who have a legitimate need to know.

6. It allows improved access to information. The structure of an integrated database provides enormous flexibility in the type of reports that can be generated and type of online inquiries that can be made.

Although there are clear advantages to having databases, there are still some disadvantages;

1. It can be expensive; installing and maintaining a database is expensive particularly in a large company.
2. Some intruders can go passed the security boundaries; although a database can be restricted access, it's always possible unauthorized users will get passed the safeguards.
3. Hutchinson and Sawyer (2002) point out the factor of Privacy. A database may hold unsanctioned information that may lead to whole database crashing. For example viruses.

### **2.3 Data Management System**

Connolly T. Begg C. (2002) defines Data management as; the storage, retrieval, and manipulation of data to be used by the company. Many existing information systems were designed using traditional approaches to data management but the trend has shifted to the use of database approach to develop new information systems.

#### **2.3.1 Approach to database management**

Better control. A database management system allows data to be centralized for improved data security. By centralizing data, advanced data structures can be used to control redundancy. Data structures," refers to the manner in which the data elements and records are related to each other" (Long, 1989, p.259).

Long (2002) and Timothy & Linda (2000-2001) agree that, there are three fundamental approaches to design database system namely;

1. The relational DBMS approach.
2. Hierarchical approach,
3. CODASYL DBMS approach and

### **2.3.1.1 Relational DBMS**

The relational approach to database management systems has been gaining momentum through the 1980's. In contrast, to the network DBMS, here data are accessed by content rather than by address. This approach uses the computer to search the database for the desired data rather than accessing data through a series of indices and physical addresses, as with both hierarchical and network DBMS.

### **2.3.1.2 Hierarchical DBMS approach**

This is more as a result of momentum than choice. Information management system a hierarchical product was by 1968 the game on shelves and this made it become more popular. It can be run on today's hardware.

It does not have the scope of features of more sophisticated network and relational DBMS'. Never the less, all new developments in the area of database management system use network or relational technologies.

Hierarchical DBMS is based on three data structures, actually an uprooted tree turned upside down. They are easy to understand and conceptualize.

### **2.3.1.3 CODASYL DBMS**

This approach to data management carries the hierarchical approach to the next level of sophistication by permitting children to have more than one parent. This approach minimizes redundancy and therefore allows for more queries to be made.

However, for applications where the transaction value is low and the need for flexibility is high, relational DBMS out perform network DBMS because "relational structure provides greater flexibility in accessing information". And provide companies with greater opportunities to increase productivity.

## **2.4 Areas of application**

Long (2002) and Timothy & Linda (2000-2001)

1. Database management systems are applied in all corners of development. It is mainly used in financial institutions for example; bank of Uganda, Centenary, Stanbic name it all. It is also used in higher institutions of learning. In telecommunication companies.
2. Specifically, Transport Information Systems are used in Transportation companies.

## **2.5 Database Design**

Williams et al (1999), divides the process of database design into three distinct stages namely; conceptual design, logical design and physical design; Conceptual design; this will involve identification of entities and their attributes; Logical design; this will involve identifying of primary keys, alternate key and any other keys that might be useful. Relationships between the entities will also be identified; Lastly Physical design; this will involve converting the entities and attributes into tables and columns in addition to specifying how data will be represented on the hardware.

## **2.6 Information System.**

According to Jeffery I. Whitten (2001), System analysis and design methods, 5<sup>th</sup> edition, pg 260, pg 261, pg 264, ISBN 0-07-231539-3, defines an Information system as an arrangement of people, data, processes, information presentation and information technology that interact to support and improve day-to-day operations in a business as well as support the problem- solving and decision- making needs of management users.

Information is data that has been refined and organized by processing and purposeful intelligence.

Information Technology (IT) is a contemporary term that describes the combination of computer technology (hardware and software) with telecommunication technology (data, images and voice network)

## **2.6.1 Types of Information System.**

Businesses have both front-office Information Systems that support business functions that reach out to customers (or constituents) as well as

Back-office Information Systems that support internal business operations and interact with suppliers (of materials, equipments, supplies and services). They both feed data to the Management Information System (MIS)

### **2.6.1.1 Transaction Processing System (TPS)**

Are information Systems applications that capture and process data about business transactions. i.e Airline reservations, Bank deposits and withdraws, Course registration.

### **2.6.1.2 Management Information System (MIS)**

Is an Information System application that provides for management- oriented reporting. These reports are usually generated on a predetermined schedule and appear in a prearranged format. i.e budget forecasting, cash flow reports, inventory reporting, material requirements planning.

### **2.6.1.3 Decision Support System (DSS)**

Is an Information System application that provides its user's with decision- oriented information. Whenever a decision- making situation arises. When applied to executive managers. Some times it's called Executive Information System.

### **2.6.1.4 Expert Information System (EIS)**

Is a programmed decision- making Information System that captures and reproduces the knowledge and expertise of an expert problem solver or decision maker and then simulates the "thinking" or "actions" of that expert.

### **2.6.1.5 Office Automation (OA)**

This system supports the wide range of business office activities that provide for improved work flow and communication between workers, regardless of whether or not those workers are located in the same office.



### **2.6.1.6 Transport Information System (TIS)**

Is an Information System application that keeps track of the information that is used in a company.

### **2.7 Analysis and design**

According to Jeffery and Whitten (2001), once data has been gathered, the researchers need to organize into coherent groups so that it can be easily interpreted. There are various tools that can be used to analyze and model the desired system. Modeling tools enable the analyst to design a skeletal representation of the desired system. Examples of such tools include; CASE tools, dataflow diagrams, flow charts, connectivity diagrams, grid charts, decision tables and many others.

Jeffery and Whitten (2001) further define the above tools as below; CASE tools: (computer aided software engineering) is a software program that automate many activities in the SDLC and are also used to analyze various aspects of a system.

Data flow Diagrams; are better defined by Hutchinson et al, (2000), chapter.9.12: as a data process model, that graphically shows the flow of data through a system that is, the essential processes that an input goes through before its turned into outputs.

System flow charts; Also called the system flow diagram a system flowchart diagrams the major inputs, outputs, and processes of a system. In some cases a systems flow chart can be used in place of DFD; in other cases it is useful to supplement.

Grid charts; this shows the relationship between data on input documents and data on output documents.

Decision tables: These show the decision rules that apply when certain conditions occur and what actions are taken. That is, it provides a model of a simple, structured decision-making process. It shows which conditions must occur in order for particular actions to occur.

## **2.8 Data collection techniques**

### **2.8.1 Interview**

Interviews will be used as the main data collection tool. The researchers will be required to interact face to face with the respondents. This will enable the interviewers to probe for more information as will be needed.

### **2.8.2 Observation**

The researchers will observe respondents and record facts about the activity at hand. The researchers will also participate in performing some activities so as to learn more about the current activities in UTODA company. The main purpose of using this method will be to validate the data collected using other techniques

## **CHAPTER THREE**

### **METHODOLOGY**

#### **3.0 Introduction**

This chapter presents methods and techniques that will be used in the development of a Transport Information System for UTODA. It specifies the study population, organizational unit that will be studied, procedures that will be followed, sample size, research instruments, design techniques, development tools to build the system.

#### **3.1 Area of Study**

Uganda Taxi Operators and Drivers Association started in 1990. The company manages both new and old taxi parks and all the stages around Uganda, and its main branch located on Ben Kiwanuka Street. The company leadership ranks from the chairman up to the conductors as viewed in the hierarchy on one of the pages.

Uganda Taxi Operators and Drivers Association (UTODA) is a company that manages the transportation of passengers and their property on the roads of Uganda as a service provider.

#### **3.2 Study Population**

The company administrator at UTODA will provide the information that the researchers will require from the company management. Information of interest will include; what information the company is required to keep, what other related companies that the company deals with for example if it carries out business with Uganda Revenue Authority (URA). The researchers will need that information to be stored in the database for the system. From the receptionist, information of interest will include payment details, from the staff the researchers will need information concerning payment details. Finally the receptionist who receives clients and checks for the existing files, will also provide details that are normally required from clients.

The targeted population will be the staff, receptionist, database administrators and the clients.

### **3.3 Sample size**

The company has forty seven administrators from top level management; twenty to thirty persons will be interviewed. From the chairman who supports staff members, at least eighteen of them will be considered in the study, the receptionist, two staff members for classes despite those mentioned above. And finally an expert in the fields of database design and Visual Basic programming will as well be considered.

### **3.4 Research procedure to be used**

Before the study, a letter will be acquired from the Faculty introducing the researchers to the company or company management. The fact that the company is around Kampala, the researchers will physically go to the company with the letter to seek permission to carry out the study from the company. This will be done to ensure that the study is formal.

A day convenient for both the company management and the researchers will be agreed upon and later on carry out the study. The fact that the sample size is small (three), interviews will be used. Some times it can be hard to understand the technical language and thus the researchers will need to physically interact with the respondent to clearly understand what the company do and what would the company like the system to do.

### **Sampling Techniques**

#### **Interview**

Interviews will be used as the main data collection tool. The researchers will be required to interact face to face with the respondents. This will enable the interviewer to probe for more information as will be needed. In addition to interview, the researchers will also use observation.

Because when interviews are used correctly, they offer the following advantages:

1. They provide data that may not be possible to get using a questionnaire and other techniques because it allows for probing..
2. It is possible to obtain data required for specific objectives.
3. The researchers can clarify on certain questions and thus they are more flexible compared to other methods.
4. Unlike questionnaires, the interviewer can get more complete and honest information.
5. High response since the respondents can refuse to answer completely.

However, it often carries the following disadvantages; high cost, need for high level of interpersonal skill, bias, small sample size, responses being influenced is always expected.

Like questionnaires, interviews are of two types that is; structured interview and unstructured interview where, structured questions usually categories and the interviewer simply checks the respondent's response while unstructured questions , the interviewer asks questions or makes comments intended to lead the respondent towards giving data to meet the study objectives.

### **3.5.2 Observation**

The researchers will observe respondents and record facts about the activity at hand. The researchers will also participate in performing some activities so as to learn more about the current activities in UTODA company. The main purpose of using this method will be to validate the data collected using other techniques

### **3.5.3 Questionnaires**

Haag Cummings McCubbery (2000), in their book; Management information systems for information age, coincide with Olive and Abel (1999, p.85) when they describe questionnaires as tools that are commonly used to obtain information when the sample size is large and the time available not enough for an interview. Each item in the questionnaire is designed to address specific objective. And therefore, a questionnaire must be well designed to cover all the objectives of the study and to avoid cases like;

Confusing respondents on the kind of information needed, and a poorly designed questionnaire discourages respondents from completing the questions and this may lead to lack of important information required in the study.

Just like interviews, Questionnaires are of two types these are; open ended and closed ended questionnaires.

**Closed ended questionnaires** carry with them the following advantages:

They are easier to analyze since they are in an immediate usable form.

They are easier to administer since each question is followed by possible answers and they are economical in terms of space, time, and money.

However, they are more difficult to construct and normally responses are limited and respondents are compelled to answer according to the researchers' choice.

**Open ended questionnaires** on the other hand give the respondent complete freedom to answer the way he/she wants, permit greater depth of response, and it is easy to formulate compared to closed ended questionnaire, and really gives ones feelings about a given study.

However, there's a tendency of respondents giving information that does not answer the questions at hand this may be as a result of respondents not understanding the questions and responses may be difficult to analyze and can be time consuming and expensive compared to closed ended questionnaires. The fact that we will be interested in specific data from respondents, we recommend that closed ended questionnaires be used to make it easy for us to analyze the data.

#### **3.5.4 Document analysis**

Whitten, Bentley and Dittman (2001), argue that there are several documents that can be used to collected data about a company. They point out the following as most important documents; the company's company chart to enable him study and understand flow of authority and information, the details of the products and services that the company deals in, documents that usually go through processing/ verification these are important in the identification of inputs and outputs for a particular company.

Specifically, the important document in the study, it can be the employee, client cards and files that bare the information about a particular client or employee and documents that give details of contracts that the company makes with its employees. Finally, the researchers will read documents that describe the problem at hand such as;

documentation of the current system, constitution, enrolment records, accounting records, brochures showing fees structures and any other relevant reports. All these can enable the researchers to get a view of the kind of information to be used and reports to be printed and many others.

Given all the above data collection techniques, the researchers must look at the exact problem to be addressed and the prevailing conditions and thereafter choose out which method to use or where possible the researchers can as well choose to integrate all of them.

### **3.6 Methodology Development**

System analysis and design is a six phase problem solving procedure for designing an information system and improving it. The six phases make up a system development life cycle. The system development life cycle is defined as “The step by step process that many companies follow during systems analysis and design”

The number of phases may vary from one company to another, and even the name of the process may differ (application development cycle, structured development life cycle, for instance).The six phases of systems analysis and design may be said to be as follows:

1. Preliminary investigation: Conduct preliminary analysis, propose alternative solutions, and describe the costs and benefits of each solution. Submit a preliminary plan with recommendations. If you are doing a systems analysis, and design, it's safe, even preferable to assume that you know nothing about the problem at hand. In the first phase, it's your job to mainly ask questions, do research and try to come up with a preliminary plan.
2. Systems analysis: gather data; analyze the data using tolls of written documents, interviews, questionnaire, observations, and sampling. Analyze the data using CASE tools, data flow diagrams, systems flow

charts, connectivity diagrams, grid charts, and decision tables and write a report.

3. Systems design: make a preliminary design and then a detailed design. Using CASE tools, prototyping tools and project management software among others. Do a detailed design, defining requirements for output, input, storage, and processing and system controls and backup finally write a report?
4. Systems development: Acquire the hardware and software and test the system. In the make or buy decision, you decide whether you have to create a program or have it custom written or buy it meaning simply purchase a system software package. If you decide to create anew program, then the question is whether to use the company's own staff programmers or hire outside contract programmers. Which ever way you go, the task could take many months. Having made a decision, the hardware to run it must be acquired or upgraded or buy new hardware.
5. Systems implementation: convert the hardware, software, and files to the new system and train the users. Convert using any of the following conversions; parallel, phased or pilot. Compile final documentation and train the users.
6. Systems maintenance: audit the system, request feedback from its users, and evaluate it periodically.

Therefore, basing on the fact that knowledge is power, and armed with above knowledge in various methods and techniques, we can now clearly suggest variable methods and techniques that can be applied in the design and implementation of a Transport Information System for UTODA.

### **3.7 Data analysis**

After data have been collected, it will be tabulated using Excel to make it easy for the analyst to analyze and interpret it and come up with the system requirements for the Transport Information System.



### **3.8 Coding, Testing and Debugging**

#### **3.8.1 Coding.**

This will involve selecting a suitable programming language and DBMS and write actual code that provides services to the system users. Access will be used as a DBMS for creating the database. And Visual Basic will be used to create the user interface.

#### **3.8.2 Testing.**

Testing will be done to ensure that the system works, what it is intended to do. The major objectives will be;

To remove errors and to ensure that the software satisfies the user requirements. Testing will be done at three different levels that is unit testing; system testing and acceptance testing.

Unit testing; the data base will be tested individually just as the Visual Basic application will be tested. System testing; the Visual Basic application and the database will be linked together and tested as a whole. After the system has passed this test, the system will go to a third level. Acceptance testing; under this, the software will be presented to the user to further test and confirm whether it agrees with the users requirements.

### **3.9 Database Design Tools**

Microsoft Access will be used in the creation of a database system and Visual Basic 6.0 will be used in the creation of the user interface.

### **3.10 Limitation of the Study**

Resistance from the users is a big problem during system design. At some point the employees fear that the new system is going to affect their jobs in terms of being replaced by the system, not knowing that the employee supposed to be taught how the system works. Since most of the employees are computer illiterate they think that learning how to use the system will be hard for them.

Easy adaptation of the proposed system has to be evaluated due to it's usefulness in the future. UTODA company is afraid that the system may not efficiently work as expected like the company's traditional method of book keeping, thus making a loss after purchasing the hardware and software. And this is true for every company that is working with an information system for the first time. Until the company justifies some of the functionality of the system over a period of time.

Coordinating the project information was not easy since the researchers would do the need full so as to get information from the people responsible. Such as the respondents for the executive members they seem to be very busy we could not get enough from them, with the exception of the Vice chairman. Who spared the researchers a little of his time and referred us to the staff such as the cashier who was not willing to give us any information concerning the company but all we witnessed from the cashiers teller was that she was meandering looking for previous files which was in one of the cupboards.

The researchers approached the Guides and supervisors asked us to explain to them how the new system was to operate. Which we educated them quite well and one of the supervisors fired us questions on knowing that the new system will not unemployed most of them, since they believe that a computer can do a job done by many people. Since then most of them went at their working points around town.

The researchers tried getting information from the guides and supervisors, but all they needed was something little so as to get the researchers some information which at times was not use full to the research, that is after paying them.

The researchers did not finish up with getting enough information from the company, since the deadline for handing in the projects was too short from the day we started the project.

### **3.11 System Requirements**

#### **3.11.1 Hardware Requirements.**

This section describes a minimum hardware requirement for developing and installing the software (Transport Information System), the application has to be installed on a machine with at least these minimum requirements;-

2.4 GHz Pentium4, 256MB of RAM (Random Access Memory).

Hard disk drive with a capacity of 4 GB. This will enable storage of large amount of information compared to the use of several floppy disks. Therefore information can easily be read and written. Backup disks, which will be used in case of system failure so as to prevent data from being lost.

#### **3.11.2. Software Requirements**

Windows XP, Microsoft Visual Basic 6.0 and Microsoft Access was used in the developing the proposed system. This is because Windows XP has advanced security facilities that will prevent un authorized user from interfering with the information of various users of the system. It also has well developed logging facilities that will enable the client to log in when looking for basic details. Windows XP is more reliable hence one can be able to control a computer without failure for a long period of time. And an antivirus will be needed so as to protect the system from multifunction.

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### Appendix 1: The Time Frame work

Duration	Activities
May- June	Data collection and Analysis
June - July	Prototyping and Designing of the system
July - August	Implementing and testing of the system

### Appendix 2: Budget

Item	Quantity	Amount	Total
Computer	8	480,000	3,840,000
Printer	3	150,000	450,000
Scanner	2	250,000	500,000
Network Cables	24 ft	500,000	500,000
Server	1	800,000	800,000
			<b>T.T Amount 6,090,000</b>