

CONTRACT ADMINISTRATION SYSTEM

by

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PGD/MCS/2007/1218

Submitted to Department of Mathematics/Computer Science

Federal University of Technology

Minna

In partial fulfillment of requirements leading to the award of

Postgraduate Diploma (PGD) in Computer Science

Federal University of Technology, Minna

May, 2010

CERTIFICATION

This project title, "Contract Administration System" , by BODUNDE, Tanimola Olusegun, meets the regulations governing the award of Postgraduate Diploma in Computer Science of Federal University of Technology, Minna.

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DEDICATION

This project is dedicated to the Almighty God whose immeasurable Grace enabled me to complete this project work.

I also dedicate this project to my beloved wife Dupe, children Adeife and Anjola whose persistent prayer see me through this programme.

ACKNOWLEDGEMENT

Honour and glory be unto God Almighty, whose love and mercies were sufficient for me throughout this programme. Thank you Lord!

Also I wish to express my gratitude to Mallam M.A. Adamu my project supervisor who despite his tight schedule was able to go through the work.

My sincere thanks go to Prof. N. I. Akinwande the head of department, Prof. K. R. Adeboye, Dr. Y. M. Aiyesimi, Dr. Y. Abubakar, Dr. L. N. Ezeako, Dr. V.O. Waziri, Dr. M. Jiya, the PGD Coordinator Mallam A. Ndanusa and other lectures who assisted in their various ways to see that this work is successful.

I will not forget to express my words of appreciation to my fellow PGD students, my colleague in the office and my brother Olujames for their support and encouragement.

Thank you all.

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ABSTRACT

Contract Administration involves those activities performed by government officials after a contract has been awarded to determine how well the government and the Contractor performed to meet the requirement of the contract. The contract administration process in Nigeria is full of problems which are due to inadequate development and implementation of contract administration system to check practices involved in awarding contracts monitor, manage and track contract performance, records and report events and execute prompt payment of contractors. This leads to fraudulent acts, mistakes and unnecessary stress caused to the client and contractor. The adoption of the system designed in the course of this project will help the process of contract administration in the following ways, making the process faster and more streamlined, reducing paperwork, ensure proper documentation of all details regarding a contract, reducing unnecessary mistakes in recording details and limiting the chances of fraudulent acts to the barest minimum.

CHAPTER ONE

INTRODUCTION

1.1 Background

Contract Administration involves those activities performed by government officials after a contract has been awarded to determine how well the government and the contractor performed to meet the requirements of the contract. It encompasses all dealings between the government and the contractor from the time the contract is awarded until the work has been completed and accepted or the contract terminated, payment has been made, and disputes have been resolved. As such, contract administration constitutes that primary part of the procurement process that assures the government gets what it paid for. In contract administration, the focus is on obtaining supplies and services, of requisite quality, on time, and within budget. While the legal requirements of the contract are determinative of the proper course of action of government officials in administering a contract, the exercise of skill and judgment is often required in order to protect effectively the public interest.

The specific nature and extent of contract administration varies from contract to contract. It can range from the minimum acceptance of a delivery and payment to the contractor to extensive involvement by program, audit and procurement officials throughout the contract term. Factors influencing the degree of contract administration include the nature of the work, the type of contract, and the experience and commitment of the personnel involved. Contract administration starts with developing clear, concise

performance based statements of work to the extent possible, and preparing a contract administration plan that cost effectively measures the contractor's performance and provides documentation to pay accordingly.

Post award orientation, either by conference, letter or some other form of communication, should be the beginning of the actual process of good contract administration. This communication process can be a useful tool that helps government and contractor achieve a clear and mutual understanding of the contract requirements, helps the contractor understand the roles and responsibilities of the government officials who will administer the contract, and reduces future problems. It is helpful to have a pre-meeting with applicable program and contracting officials prior to the post award orientation conference so that there is a clear understanding of their specific responsibilities and restrictions in administering the contract. Items that should be discussed at the pre-meeting include such things as the authority of government personnel who will administer the contract, quality control and testing, the specific contract deliverable requirements, special contract provisions, the government's procedures for monitoring and measuring performance, contractor billing, voucher approval and payment procedures.

Where appropriate, an alternative dispute resolution (ADR) technique known as "partnering" should be discussed with the contractor to help avoid future contract administration problems. Partnering is a technique to prevent disputes from occurring. It involves government and contractor management staff mutually developing a "plan for success", usually with the assistance of a neutral facilitator. The facilitator helps the

parties establish a non-adversarial relationship, define mutual goals and identify the major obstacles to success for the project. Potential sources of conflict are identified, and the parties seek cooperative ways to resolve any disputes that may arise during contract performance. The process results in the parties developing a partnership charter, which serves as a roadmap for contract success.

Good contract administration assures that the end users are satisfied with the product or service being obtained under the contract. One way to accomplish customer satisfaction is to obtain input directly from the customers through the use of customer satisfaction surveys. These surveys help to improve contractor performance because the feedback can be used to notify the contractor when specified aspects of the contract are not being met. In addition, the contracting and program officials can use the information as a source of past performance information on subsequent contract awards. Customer satisfaction surveys also help to improve communications between the procurement, program, and contractor personnel.

The process of contract administration helps to assure the project's goals and needs are on track and on schedule and the seller is behaving appropriately. It also aims to keep proper record and documentation of all activities of both parties at each stage in the execution of the contract.

Due to inability of the traditional contract administration system to check on the legitimacy of contractors involved in the contract process, this has led to high degree of fraud, mistakes and insecurity. Online contracting services allow businesses to post positions for which they wish to hire outside resources, and allow individuals to identify

projects that best suit their interests, schedules and skills. With the advent of Contract Administration system the legitimacy and integrity of the contractor or buyer would be checked and implementation of security mechanism would also be put in place alongside prompt payment process. The Contract Management Plan utilizes the existing contract requirements to provide the buyer and the seller with guidelines for administering and monitoring contracts for significant purchases or acquisitions.

1.2 Statement of the Problem

The problem of fraud in the execution of contracts is one that is rampant in our society especially concerning the award and execution of government contracts. Thus, it is necessary to find and develop an effective way of controlling and monitoring the contract administration process.

1.3 Aim and Objectives

The aim of the research project is to check the insecurity and inconsistency during contract administration between the client and contractor.

The objectives of contract administration system are to achieve the following:

1. Integrity checking between contractors.
2. View of existing contracts.
3. Allocation of contracts.
4. Record checking and feedback

5. Performance report and tracking.
6. Recording of payment on performance basis.
7. Registration of parties involved.
8. Keeping record of bids on contracts.
9. The system uses audit trails or logs to track internal fraud that could occur in the organization

In addition, the system is designed and developed to deliver secure, consistent, stress-free contract awarding and execution for the benefit of all parties involved.

1.4 Research Questions

How will the development of contract administration system meet the following?

1. Checking the insecurity and inconsistency of contract administering between the parties involved?
2. Reduce the stress involved in the traditional way of administering contract which involves too much paperwork?
3. How will it check the integrity of the parties involved?
4. How will it check the legitimacy of the parties involved?
5. How will it reduce unnecessary mistakes and high degree of fraudulent acts which are rampant in the society?

6. How will it surpass the traditional method of administering contracts?

1.5 Methodology

The project work will be implemented using Visual Basic as the programming language and Microsoft Access is used in the design of the database of the organization and keeping the contractors' records and information.

Visual Basic is not only a programming language, but also a complete graphical development environment. This environment allows users with little programming experience to quickly develop useful Microsoft Windows applications which have the ability to use OLE (Object Linking and Embedding) objects, such as an Excel spreadsheet. Visual Basic also has the ability to develop programs that can be used as a front end application to a database system, serving as the user interface which collects user input and displays formatted output in a more appealing and useful form than many SQL versions are capable of.

1.6 Significance of the Study

A lot of instances of fraud happen due to insecurity and inconsistencies in the contract administration process which could be averted by the implementation of a consistent and reliable method of managing the process of executing contracts. The significance of this project lies in discovering and implementing a secure, regular and dependable contract administration system so as to check these inconsistencies and insecurities and restore order to the process of administering contracts.

1.7 Scope of the Study

The Contract Administration System is designed to take care of only a specific number of contract types to fulfill the objectives mentioned above which include the registration of both parties to check the integrity of the parties, storing information about the details of the contract, keeping track of the progress of the work on the contract, providing facilities for payment for work done as at when due, checking that contracts are completed by the specified date as well as making sure that the contract terms are adhered to by both parties.

1.8 Limitation of the Study

The study is limited to the objectives stated above and also limited to environment in which the system is to be used. As may have already been noted, there are several types of contracts each of which requires specific input, processing and output details. As a result, the system may not be able to incorporate the administration of certain types of contracts. However, we hope that future research may well extend the system to cover those areas.

1.9 Definition of Terms

Contract: A legal agreement that is binding upon the parties involved.

Administration: The act of administering something such as an oath, medicine, or sacrament, In Law it is the legal disposal or management of a deceased person's estate or an estate held in trust

Client: A person who is responsible for allocating a contract.

Contractor: A person who receives a contract and implements it.

Law: A rule of conduct or procedure recognized in a community as binding or enforceable by authority.

Database: A systematically arranged collection of computer data, structured so that it can be automatically retrieved or manipulated.

Visual Basic (VB): This is the third-generation event-driven programming language and integrated development environment (IDE) from Microsoft for its COM programming model.

SQL (Structured Query Language): Standardized language that approximates the structure of natural English for obtaining information from databases.

Fraud: The crime of cheating somebody or the crime of obtaining money or some other benefit by deliberate deception.

Atomicity: Either all of the operations are performed on the database, or none of the operations are performed.

Consistency: All the related changes that occur as a result of the operations in the transaction must occur successfully. The state of the database must be consistent after the transaction.

Isolation: The transaction must be isolated from the operations of other transactions that have not yet completed. Transactions must be (or appear internally to be) serialized.

Durability: When the transaction completes, its changes will be present in the database, even if system failures occur.

CHAPTER TWO

LITERATURE REVIEW

2.1 Overview of Contract Administration

Contract Administration involves those activities performed by government officials after a contract has been awarded to determine how well the government and the contractor performed to meet the requirements of the contract. It encompasses all dealings between the government and the contractor from the time the contract is awarded until the work has been completed and accepted or the contract terminated, payment has been made, and disputes have been resolved. As such, contract administration constitutes that primary part of the procurement process that assures the government gets what it paid for. In contract administration, the focus is on obtaining supplies and services, of requisite quality, on time and within budget. While the legal requirements of the contract are determinative of the proper course of action of government officials in administering a contract, the exercise of skill and judgment is often required in order to protect effectively the public interest.

The specific nature and extent of contract administration varies from contract to contract. It can range from the minimum acceptance of a delivery and payment to the contractor to extensive involvement by program, audit and procurement officials throughout the contract term.

2.1.1 Factors Influencing Contract Administration

The administering of contracts can be influenced by some factors which include.

1. Nature of work involved: This explain the kind and type of working activities that is involves in carrying out the contract process. It is a factor that influences the way contracts are administered in any sector of the economy. Political and legal factors, norms and beliefs, economic policies, socio cultural factors can affect the work thereby affecting or influencing the contract administration process.

2. Type of Contract: This is a very important factor that influences the way contract are administered. There are different contracts with different procedures of administering and executing. With these changes that exists among contracts makes it a factor influencing the contract administration. The different types of contract can range from road contracts, services contracts, building contracts, transport contracts, medical contracts and so on.

3. The Commitment of the personnel involved: The contribution and active role played by the personnel involved matters a lot in contract administering and also influence the way and how contracts are carried out. A 100 %(percent) commitment by personnel involved in contract administration process will produce better output or result than 50 %(percent) commitment by personnel.

4. Experience of the personnel involved: The knowledgeable and experience nature of the personnel involved in contract administration influences the practice and activities of contract administering. It goes a long way of validating if the contract administering will be feasible. The success of contract administering is dependent on the experience nature of personnel involved.

2.2 Methodology of Contract Administration

The methodology of contract administration involves the methods, techniques and procedure of administering a contract to party that has met all contract requirements.

Contract requirement of different countries vary due to varying political and legal policies that countries embark on. Taking Nigeria for instance, before a contract is awarded to any organization some requirements must have been met which are:

1. Must have registered with Corporate Affairs commission (CAC) of Nigeria.
2. Register with the Federal Board of Inland Revenue Department of the Ministry of Finance for income tax.
3. Register for VAT.
4. Register for personal income tax PAYE at the State Tax office.

If a company or organization does not go through these procedures then the awarding of contract will not be feasible. Contract administration is dependent on the fulfillment and legibility of the organization by contract law of a particular country or nation. Contract administration requirements by an organization go through communication process which composes of activities that needs to be followed or abide for actualization of the contract.

2.2.1 Communication Process of Contract Administration

These are the following communication process that should be carried out in order to achieve a good contract administration;

Post award orientation: This is either by conference, letter or some other form of communication. It should be the beginning of the actual process of good contract administration. This communication process can be a useful tool that helps government and contractor achieve a clear and mutual understanding of the contract requirements, helps the contractor understand the roles and responsibilities of the government officials who will administer the contract, and reduces future problems.

Pre-meeting orientation: This involves activities that must be carried prior to the post award orientation conference so that understanding of roles and responsibilities are understood. Pre-meeting orientation with applicable program and contracting officials prior are considered before awarding of contract takes place so that there is a clear understanding of their specific responsibilities and restrictions in administering the contract.

Items that should be discussed at the pre-meeting include such things as the authority of government personnel who will administer the contract, quality control and testing, the specific contract deliverable requirements, special contract provisions, the government's procedures for monitoring and measuring performance, contractor billing, voucher approval, and payment procedures.

2.2.2 Activities of the Communication Process

Contract administration starts with developing clear, concise performance based statements of work possible, and preparing a contract administration plan that cost effectively measures the contractor's performance and provides documentation to pay

accordingly. Contract administration process composes of obligation, legal consequences, performance report, and contract administration plan and payment process. All these activities are performed for contract administration to achieve a well conducted and a fraud free contract execution. These activities are:

Obligation: It explains the purpose and duty of both personnel involved that is the contractor and the client. All duties and activities are stated clearly and agreed upon in a contractual document which will remain binding to both parties. People may incur obligations voluntarily by entering into a contract.

Legal consequences: These are punishment or outcome arising from a breach of contract binding among parties or personnel involved. It backed up by the law since a contractual document or legal document was formally agreed upon. The legal consequences arise from the failure to perform the obligations stipulated for.

Performance report: This is a document that shows and analyzes the progress of the contract execution plan. Depending on whatever was agreed by the contractor and client a performance report should show the progress and tracking of the contract activities.

Contract Administration Plan: A strategy, art of employing all elements of contract administration to accomplish the objectives of a contract. It is a systematic strategy or approach that brings together elements of contract administration processes to solely achieve a good or best practice on contract administering of parties involved.

Documentation to Pay: The payment process and procedures will be documented and automated for the contractor. This will result in the payment of whatever percent job

done. The documentation is done in order for traceability and avoiding fraudulent act in execution of the project. This payment procedure is done on the bases that every legal and obligation has been met.

Negotiation: the reaching of agreement through discussion and compromise or resolving of disagreements. One or more meetings at which attempts are made to reach agreement through discussion and compromise between the contractor and client. During the process of negotiating, parties involved have the explicit and exclusive right to bargain, auction and place for RFPs which will spell out the obligation in the contract or agreement. Negotiation is composed of three processes namely;

- **Bargaining:** an agreement between the contractor and client in which each promises to carry out an obligation. The bargaining process depends on the type of contract involved.

- **Auction:** it is a market mechanism by which sellers place items for buyers to make a bids on or buyers place RFPs for specific items and sellers place bid to win the jobs. It is a competitive process in which a seller solicits consecutives bids from buyers (forward auctions) or a buyer solicits bids from sellers (backward auction). It is the sales of goods or property at which intending buyers bid against one another for individual items in which it is sold to the bidder offering highest price.

- **Request for proposals (RFPs):** This is a document that is placed by contractors for a specific contract. It involves a negotiating process for a proposal request on carrying out or performing a specific contract between the contractor and client.

2.2.3 Techniques Used For Contract Administration

Where appropriate, an alternative dispute resolution (ADR) technique known as “partnering” should be discussed with the contractor to help avoid future contract administration problems. Partnering is a technique to prevent disputes from occurring. It involves government and contractor management staff mutually developing a “plan for success,” usually with the assistance of a neutral facilitator. The facilitator helps the parties establish a no adversarial relationship, define mutual goals and identify the major obstacles to success for the project. Potential sources of conflict are identified, and the parties seek cooperative ways to resolve any disputes that may arise during contract performance. The process results in the parties developing a partnership charter which serves as a roadmap for contract success. Many agencies have successfully used partnering on construction projects and are now beginning to apply these principles in the automated data processing/information resources management area.

Good contract administration assures that the end users are satisfied with the product or service being obtained under the contract. One way to accomplish customer satisfaction is to obtain input directly from the customers through the use of customer satisfaction surveys. These surveys help to improve contractor performance because the feedback can be used to notify the contractor when specified aspects of the contract are not being met. In addition, the contracting and program officials can use the information as a source of past performance information on subsequent contract awards. Customer satisfaction surveys also help to improve communications between the procurement, program, and contractor personnel.

Best Practices are defined as techniques that agencies may use to help detect and avoid problems in the acquisition, management, and administration of contracts. Best practices are practical techniques gained from practical experience that may be used to improve the contract administration process.

All best practice have been inculcated and integrated into the proposed contracts administration system to check and accomplish the objectives of the system especially in the area of fraud.

2.2.4 Vouchers/Invoice Review, Approval, and Processing

Voucher processing is just as important as any other aspect of contract administration. Payment to the contractor for the supplies and services delivered is the government's obligation under the contract. The government expects the contractor to meet all contract requirements for quality, quantity and timeliness. The contractor expects no less of the government in meeting its obligation to timely, accurate payment for supplies and services received. A plan or process for quickly and efficiently meeting this obligation is as essential.

It is important for agency or government that is responsible or saddled with the obligation of payment to take the voucher review, approval and processing as important as any aspect of contract administration.

This will ensure that payment is only made to contractors who perform in accordance with contract terms and conditions. It is essential that these tasks are discussed with the contractor and COTR during the post award orientation conference. An important aspect

of voucher review, approval, and processing is good communication between the COTR, contracting officer, and finance official (Accountant) to ensure that payment is made on time.

2.2.5 Contract Closeout

Contract closeout begins when the contract has been physically complete, i.e., all services have been performed and products delivered. Closeout is completed when all administrative actions have been completed, all disputes settled, and final payment has been made. The process can be simple or complex depending on the contract type. Contract closeout is an important aspect of contract administration. Although there is a pre award audit of the contractor's proposal, there is a cost-incurred audit of the contractor's claim of incurred costs and a close out audit to reconcile the contractor's final claim under the contract to incurred costs previously audited. When there is a delay in completing the cost-incurred and closeout audits, contracting officials often cannot complete the closeout process for many cost reimbursement contracts.

2.3 Contracting Officer's Technical Representative (COTR)

The government is becoming increasingly aware of the importance of proper contract administration in ensuring the maximum return on our contract money. The COTR plays a critical role in affecting the outcome of the contract administration process. The technical administration of government contracts is an essential activity. It is absolutely essential that those entrusted with the duty to ensure that the government gets all that it has bargained for must be competent in the practices of contract administration and be

aware of and faithful to the contents and limits of their delegation of authority from the contracting officer. The COTR functions as the “eyes and ears” of the contracting officer, monitoring technical performance and reporting any potential or actual problems to the contracting officer. It is imperative that the COTR stay in close communication with the contracting officer, relaying any information that may affect contractual commitments and requirements. The COTR’s contract administration duties can be simple or complex and time-consuming, depending on the type of contract, contractor performance, and the nature of the work. Minimizing the use of cost-reimbursement contracts and relying more on fixed price performance based contracts should reduce the amount of resources and time devoted to contract administration. For example, a fixed-price contract requires less surveillance by the COTR than a cost-reimbursement contract requires with its technical surveillance and auditing of cost requirements. Agencies and departments have many different phrases to describe the COTR. Other titles used are: Contracting Officer Representative (COR), Government Technical Representative (GTR), and Government Technical Evaluator (GTE).

2.4 Current Trends in Contract Administration

Several weaknesses have been identified in contract administration practices used by civilian agencies. The principal problem is that contracting officials often allocate more time to awarding contracts rather than administering existing contracts. This often leads to problems in contractor performance, cost overruns, and delays in receiving goods and services. Several other deficiencies have been noted such as unclear roles and responsibilities of the contracting officer’s this led to excessive backlog or packs up in

contract closeout and incurred costs audits, improperly trained officials performing contract administration, unclear statements of work that hinder contractor performance, and inadequate guidance on voucher processing and contract closeout. The primary objective of the contract administration practices is to establish best practices that agencies can use to improve contract administration to assure responsiveness to customers and best value to taxpayers. Improving contract administration practices will help to achieve excellence in contractor performance so that the government or agency involved receives goods and services on time, and within budget.

2.5 Electronic Contract Administration

Electronic contract administration is the process by which the awarding, execution and closing of contracts is done using electronic means including the use of computers and the internet. The process of electronic contract administration is rare in practice, more so in Nigeria which is why the development of a contracts administration system such as the one this project aims to bring about would be a welcome breakthrough.

2.5.1 The E-contracting Process

General e-contracting process

In its broadest sense, e-contracting may be described as the process whereby any or all of the following activities take place within a purely electronic environment:

- The proposed parties to a contract negotiate and form their contract through the use of an electronic communication method;

- Once the contract has been formed, the parties electronically administer and manage the contract (for example, the parties may use an online collaboration system to communicate with each other, deliver contractual notices, agree to contractual amendments, alter project drawings and provide project approvals);
- Upon completion of the contract, relevant project records and communications are archived using an electronic storage medium (as opposed to the traditional paper based method of record retention).

Each stage of the e-contracting process (as outlined above) gives rise to a number of legal and security risks.

General Legal Principles Governing the Formation of Electronic Contracts

On a fundamental level, a contract is an agreement between parties that a court will enforce. An electronic contract or 'e-contract' may simply be described as a contract that has been formed through the use of electronic communications.

Under the general law, the following five basic elements must be present before a court will enforce a contract:

- An offer;
- Acceptance of the offer;
- Certainty — from an objective viewpoint, a court must be able to ascertain what the parties have agreed;

- Intention — from an objective viewpoint, the parties must intend that their agreement will be legally binding; and
- Consideration — for a contract to be enforceable, it must be supported by consideration. Consideration may be generally defined as the price that is paid in return for a promise. To enforce a promise made by one party, the other party must do (or agree not to do) something in return for the promise.

These basic principles of contract law have been developed over the years through the judicial decisions of the courts. The current judicial trends indicate that these principles will apply to all contracts regardless of whether they are formed electronically, orally or through paper based communications. Many of the issues that arise for consideration relate to how these traditional contract law principles will apply to modern forms of technology.

General legal recognition of electronic contracts

Although complicated legal issues may arise in the formation of contracts by electronic means, there is no overriding legal impediment to parties using electronic communications to form contractual relationships.

As a general principle, the law does not require a binding contract to be established by any particular communication method. Accordingly, most contracts may be formed by any number of methods including, for example, by the post, telex, facsimile or even orally. The important principles remain the same regardless of the technology that is

used to create the contract - in other words, to create a binding contract the five legal elements outlined above must be present.

2.5.2 Methods of Electronic Contracting

Electronic contracts may be formed in a number of different ways. Some examples of the different methods that may be used to form electronic contracts include:

- **Contract formation through electronic communications:** The simplest electronic contract is formed by the exchange of text documents via electronic communications such as email.
- **XML-Contracts:** The text documents that form the basis of an electronic contract may be written in XML. XML is an abbreviation for extensible mark-up language. It is a mark-up language for documents containing structured information.

Structured information contains both content and some indication of what role that content plays. One advantage of forming contracts using XML is that contracts can be processed using machines and contracts can be imported into contract management and negotiation tools. A further advantage to using XML is achieving better specifications of the contract using industry specific XML vocabularies.

- **'Click to agree' contracts:** An electronic contract may be in the form of a 'click to agree' contract. The terms and conditions of the contract are displayed on one party's website and the other party (e.g. the customer) agrees to the contract by clicking an 'I agree' button on the website accepting the relevant terms and conditions. This type of electronic contract is commonly used for the purchase of downloaded software. Once

the transaction is completed, the issuer of the contract ordinarily sends an email to the customer confirming the details of the transaction.

Generally, when parties decide upon a particular method of electronic contract formation, their decision is influenced by the nature and importance of the relevant contract. For contracts of strategic importance or of high economic value, parties may wish to utilize appropriate technology that ensures the security and authenticity of relevant documentation.

2.5.3 E-contracting Security Requirements

While the security requirements of e-commerce and e-business generally have been explored (Knorr 2001, Rohrig 2004), the security requirements of e-contracting systems have not been closely examined in the literature to date. An e-contracting system should satisfy the following security goals:

- **Confidentiality:** Confidentiality ensures the protection of electronic records in the contracting system from unauthorized disclosure or use. The identity of authorized parties will be determined by the agreement between the contracting parties.
- **Integrity:** Establishing the integrity of electronic records involves ensuring that they are not duplicated, modified or deleted.
- **Authenticity:** Authenticity ensures that the parties using or accessing the e-contracting system are who they purport to be. The contracting parties must authenticate themselves to the e-contracting system and their credentials need to be recorded and maintained.

- **Cryptographic non-repudiation:** Where cryptographic non-repudiation exists, parties cannot deny from a technical point of view having performed the action or actions attributed to them, For example, a party could not deny having entered into a contract, sending or receiving a message or updating an electronic record.

- **Availability:** Availability ensures that e-contracting systems and electronic records relevant to the contract are available to authorized parties when required.

2.5.4 Issues Involved in E-contracting

Due to the peculiar nature of e-contracting i.e. its electronic nature, the process is subject to some considerations which would not ordinarily affect contracts in normal written form. These concerns are mostly legal and security risks associated with e-contracting. They should be resolved as at the time when the terms of the contract are set out. They include the following:

- The time that an electronic contract has been formed may be uncertain.
- The place where an electronic contract has been formed may be uncertain.
- The authority of an individual to enter into a construction contract on behalf of another person or entity may be uncertain.
- Electronic communications may not satisfy statutory requirements for certain contracts to be in writing.
- Electronic communications may not satisfy statutory requirements for certain contracts to be signed.

- Disruptions to the availability of a project collaboration system may cause interference with the project.
- Incompatible technology may be used by the various contracting parties.
- Disputes may arise between the provider of an online collaboration system and the contracting parties in relation to the use of the system.
- Disputes may arise between the contracting parties regarding the use of the system.
- Disputes may arise in relation to the ownership of intellectual property associated with the project.
- Electronic records created and maintained by a system may not be admissible in court as evidence in the event of a dispute.
- The identity of the contracting parties may not be able to be authenticated.

2.6 Electronic Contract Administration and Management

Overview of issues associated with the electronic administration and management of contracts

A review of the relevant literature, legislation and judicial decisions of the courts reveals that the following issues may arise in the electronic administration and management of contracts:

- The exchange of electronic communications between parties may, depending upon the terms and conditions of a contract, amount to an effective variation of the contract.

- Depending upon the terms and conditions of a contract, there may be legal uncertainties about the validity of electronic notices.
- Protocols need to be established to ensure that electronic documents viewed by all project participants are identical. It is important that each project participant is using the same software and settings to ensure that all participants view the same document.
- Online collaboration platforms are emerging as the principal tool used in electronic contract administration and management in the industry. A range of legal issues may be encountered in relation to the use of collaboration platforms.

2.6.1. Online Collaboration Platforms

An online collaboration platform is an electronic network linking different organizations for the purpose of exchanging information electronically. Documents are stored on an electronic database that contains all the information relevant to the particular project. The database can be accessed by any project participant at any time and from any place. Different organizations or individuals may have different levels of access to different documents within the database. The database is generally maintained by an external service provider who will have a contractual arrangement with at least one of the participants in the project.

The issues associated with collaboration platforms

A review of the literature reveals the following issues in connection with the use of online collaboration platforms:

- Disruptions may occur if the service provider is unable to maintain the service due to either technical difficulties or the cessation of the service provider's business.
- The contractual arrangements between the service provider and the customer and between the service provider and end users must be considered.
- Project protocols should be established setting out the standards for participants working on the project.
- The ownership of drawings and other documents and data stored in the database must be addressed and steps put in place to ensure that intellectual property infringements do not occur.
- The database should be maintained in such a way as to ensure the admissibility of the electronic records as evidence. An issue which will arise is that the system should track changes to documents so that the identity of the person making the change and the time of the change can be proven.
- Procedures should be agreed for archiving the database at the completion of the project.
- The system must have adequate security to ensure that unauthorized persons do not have access to the database and different participants should have different levels of access to the database depending on their role in the project.
- It may be difficult to ensure that all participants in the project use the collaboration platform rather than alternative means of communication such as email.

Collaboration platforms are the basic means through which the parties to a contract communicate, record and share information (collaborate) during the execution of and electronic contract.

2.7 Inferences

The application of information technology in the administration of contracts can lead to considerable efficiencies in the administration of projects and is extensively used as a means of managing and recording projects. As has been shown, electronic contract administration follows the same basic process and is subject to the same legal contractual issues as in traditional contract administration. The major distinguishing factor between e-contracting and the conventional method of contracting is the fact that electronic devices (computers, contract administration system software, networks) and information and communications technology (ICT) are used to make the process of contract administration smoother and more efficient. The use of collaboration systems is an effective means to facilitate communications between diverse parties to contracts who are often geographically distant and who assume different roles at various stages of the project. In order to improve document security and enhance accessibility of information, the CAC is converting company records into suitable electronic format for archiving on compact and reliable storage media. This will ensure that the full electronic search capability of the CAC on-line system is extended to cover all companies.

However, the use of ICT leads to uncertainties, which may have serious practical consequences for contracting parties if they remain unresolved. This Report has identified a range of legal and security issues that may arise in connection with the

formation, administration and recording of construction contracts within an electronic environment.

These uncertainties as well as the added factor of the travails of the Nigerian legal system contributes to a reduced willingness by business to take advantage of modern communication technologies as a lot of companies may view the costs of dealing with these legal uncertainties as greater than whatever reduction in costs is to be achieved through the use of the new technologies.

It must be noted that most of these problems can be solved at root level by ensuring that both parties to a contract explicitly go through the specifics or details of each stage of the contract. The remaining project deliverables for the Contract Administration System research project will investigate possible solutions to the issues identified in this Report.

CHAPTER THREE

SYSTEM DESIGN / DESIGN METHODOLOGY

3.1 Review of Existing System

The existing system of contracts administration can be viewed from two perspectives: the manual and the electronic method. In the Nigerian context, the latter is practically non-existent while the former is ridden with corrupt practices which have necessitated the development of a system such as the one being implemented.

Manually, contract administration starts with potential contractors bidding for contracts offered by a client and submitting a proposal stating, among other details, the time in which the job would be completed, the amount due. The client then awards a contract to the contractor with the most favourable bid and then approves a date to start work on the contract. An agreement is signed at this stage and the contractor then begins to work on the job. After the job is completed, the client pays the contractor the amount due for the contract and thus ends all legal obligations.

In the course of developing a new information system in the area of contracts administration to combat fraudulent acts in our society, we need to carry out some preliminary investigation which will justify the essence of this project. The preliminary investigation should mount a case to answer these questions:

Why should the system be changed?

Some reasons for change include:

- A need to increase productivity, quality or efficiency
- Concern that the existing system for contract administration in our society is not well secured and is vulnerable to fraud
- Changes in work processes, expansion of the business, changes in business requirements or the environment in which the organization operates may all lead to a reassessment of information system requirements.
- Current system may be too inflexible or expensive to maintain.

3.2 Design Approaches

The major focus of this project is to develop a contracts administration system with a number of operations to be implemented. In this chapter the development of the design model is strictly based on UML diagrams. The following UML tools were used for designing the system:

- Use Cases
- Class Diagram
- Collaboration diagram
- Sequence Diagram
- Activity Diagram

A Database Diagram and an Entity Relationship Diagram were used to model the database.

3.3 Use Cases for Contracts Administration System

Use cases specify the functionality that the system will offer from the user's perspective. A use case specifies a set of interactions between a user and the system to achieve a particular goal. The principal actors identified in the contracts administration system are the administrator and the user involved managing the contract process. The use case diagrams summarize graphically, the interactions of the actors involved in contracts administration system.

There are two different use cases namely:

- Business use case and System use case.

In a project such as this, typically the system use case models the functionality that the system will offer from the perspective of the system operator or contracts administrator while on the other hand the business use case models the overall business activities starting from the user and the administrator. The following modules and sub modules are identified below which form the system use case for the system:

1) Login Module

2) Contract Activity Module

Add contract

Edit contract

3) Contractor Module

Register contractor

Edit contractor

4) Allocation Module

Allocate contract

Edit allocation

5) Performance Module

Enter performance

Edit performance

View performance

6) Payment Module

Invoicing

Record payment

7) View Module

View contracts

View contractors

View RFP

View payment

View performance

8) RFP module

Add RFP

9) User Management Module

Add user

Delete user

Change password

The system use case for the CAS can be shown as below according to the modules available to each of the actors:

SYSTEM USE CASE

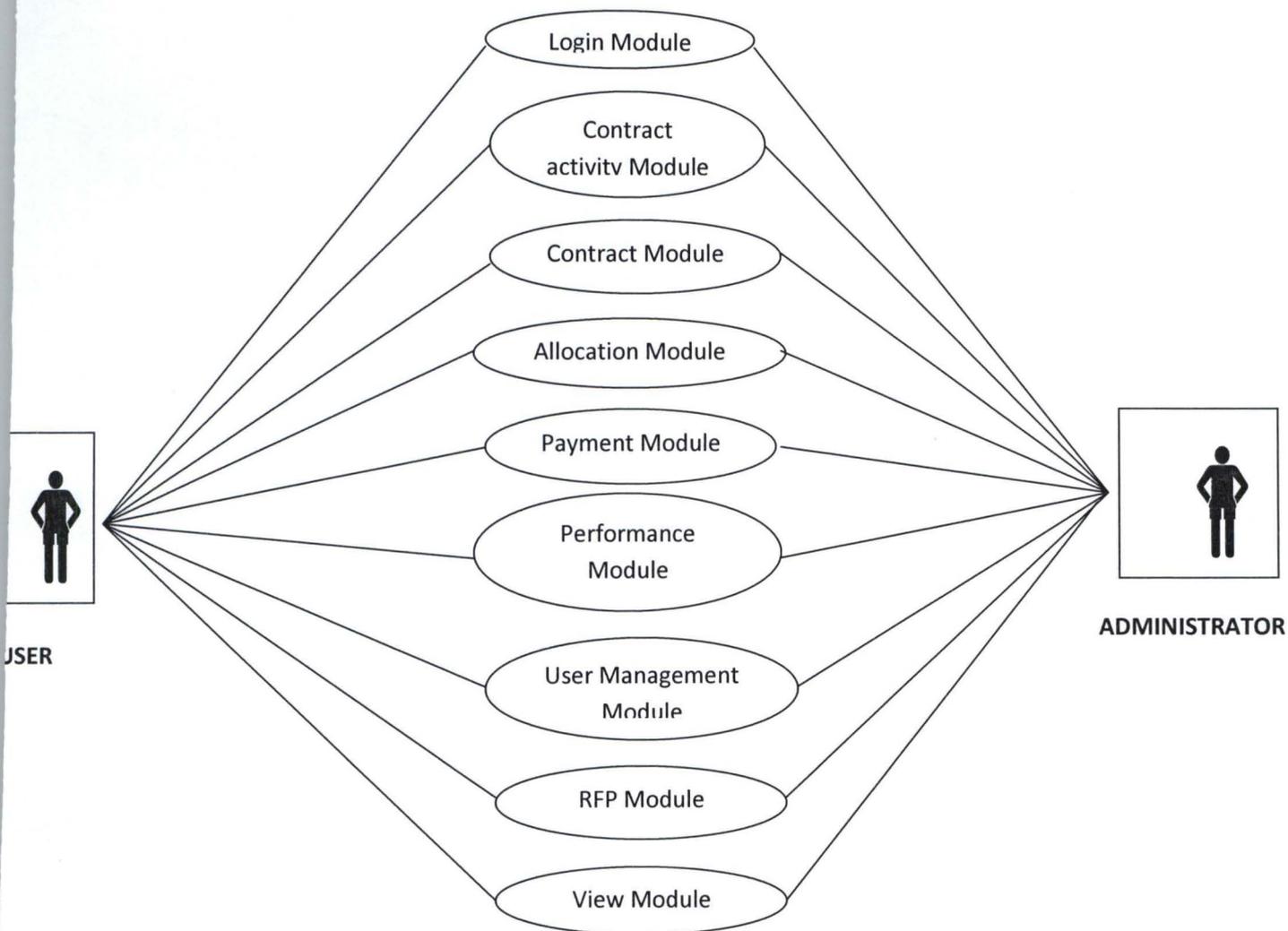


Figure 3.1 System use case of Contract Administration System

The business use case is comprised of the various activities under each module. It is shown below:

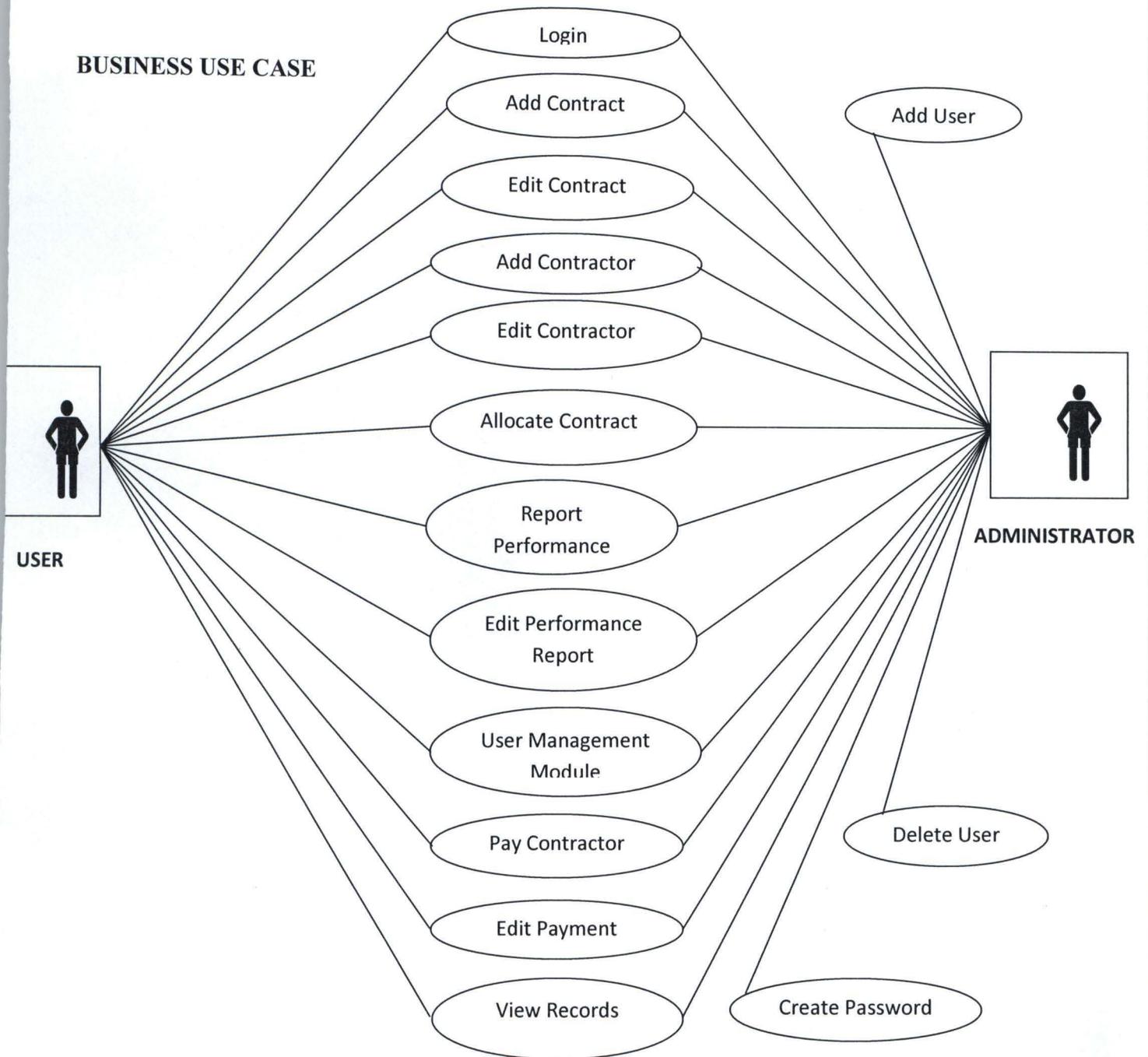


Figure 3.1: Business use case diagram for Contract Administration System

Use Case Narratives

Table 3.1 Use Case Narrative for Login.

Use Case 1	Log in to CAS		
Goal in Content	Administrator or User would be required to log-in case to CAS		
Level	This is a basic Log-in use		
Parameters	In: Administrator or user name and Password Out: CAS home page		
Preconditions	Administrator or user is a genuine staff of the company		
Post-Conditions (success end)	Administrator or user successfully gains access to the system.		
Post-Conditions (failed end)	Administrator or user is denied access to the system.		
Actor(s)	Administrator, User		
Trigger	Administrator or user request to operate the CAS		
Description (event flow)	Actor action	System respond	Affected data object with operation
	Request to operate the CAS by entering username and password	Display CAS home page via rich user interface	Verifies Username and Password

Table 3.2: Use Case Narrative for Add Contract

Use Case 2	Add Contract		
Goal in content	To add a new contract to the system		
Level	This is a basic Add Contract use case		
Parameters	In: Contract ID, name, type, duration, date of agreement		
Preconditions	Contract has been awarded to a contractor		
Post-conditions (success end)	Contract is successfully registered in the system		
Post-conditions (failed end)	Registration process is cancelled, Details are not entered or form is refilled		
Actor(s)	Administrator, user		
Trigger	New contract is required to be entered into the stem		
Description (event flow)	Actor action	System respond	Affected data object with operation
	1. Request to add a new contract	2. Displays new contract page via rich user interface,	Reads from the Contract table in the database
	3. Enters the details of the contract and click Save	4. Displays a message indicating the contract has been saved	Save contract record in the database

Table 3.3: Use Case Narrative for Edit Contract

Use Case 3	Edit Contract		
Goal in content	Contract record is required to be edited/updated		
Level	This is a basic Edit use case		
Parameters	In: Contract ID Out: Contractor details		
Preconditions	Contract has been registered with the system		
Post-conditions (success end)	Contract details are successfully edited		
Post-conditions (failed end)	Contract details are not edited		
Actor(s)	Administrator, user		
Trigger	A contract requires an update on its details		
Description (event flow)	Actor action	System respond	Affected data object with operation
	1. Request to edit contract record by entering Contract ID of the contract	2. Displays contract details page via rich user interface,	Verifies Contract ID, get contract details from database
	3. Fill in new details and click the Update button	4. Displays a message that contract records have been edited	Update contract records in the database

Table 3.4: Use Case Narrative for Add Contractor

Use Case 4	Add Contractor		
Goal in content	Administrator or user would be required to register new contractors with the system		
Level	This is a basic Registration use case		
Parameters	In: Contractor's CAC ID, business details, contact details.		
Preconditions	Contractor is a duly registered Nigerian company		
Post-conditions (success end)	Administrator or user successfully registers contractor		
Post-conditions (failed end)	Contractor cannot be registered		
Actor(s)	Administrator, user		
Trigger	A Contractor requests to be awarded a contract through the Contract Administration System		
Description (event flow)	Actor action	System respond	Affected data object with operation
	1. Request to register with the CAS by entering CAC ID.	2. Displays registration page via rich user interface.	Verifies CAC ID
	3. Enter the details of the contractor and click Save	4. Displays the message that details have been saved	Details are stored in the database

Table 3.5: Use Case Narrative for Edit Contractor

Use Case 5	Edit Contractor		
Goal in content	To update details of an existing contractor in the system		
Level	This is a basic Edit use case		
Parameters	In: CAC ID Out: Contractor details		
Preconditions	The contractor exists in the system		
Post-conditions (success end)	Contractor details are displayed and edited		
Post-conditions (failed end)	Contractor details are not edited / updated. Update process is cancelled		
Actor(s)	Administrator, user		
Trigger	Contractor details require updating.		
Description (event flow)	Actor action	System respond	Affected data object with operation
	1, Request to update details of an existing contractor	2. Displays contractor details page via rich user interface.	Queries database for contractor details
	3. Update necessary details and click Save	4. Display a message that update has been successful	Update Contractor table in the database

Table 3.6: Use Case Narrative for Add Performance

Use Case 6	Create Performance Report		
Goal in content	To Create a progress report on the performance of a contract in the system		
Level	This is a basic Create Report use case		
Parameters	In: Contract ID, performance details of contract		
Preconditions	The contract exists in the system and is active		
Post-conditions (success end)	Performance report is created		
Post-conditions (failed end)	Performance report is not created or process is cancelled		
Actor(s)	Administrator, user		
Trigger	Work has started on a contract		
Description (event flow)	Actor action	System respond	Affected data object with operation
	1. Request to create a report of details of performance of contract	2. Displays Report page via rich user interface.	Queries database for Report details
	3. Enter details of the performance of the contract and click Save	4. Save the report information,	Save report to database

Table 3.7: Use Case Narrative for Update Performance

Use Case 7	Update performance Report		
Goal in content	To update a progress report on the performance of a contract in the system		
Level	This is a basic Update use case		
Parameters	In: Contract ID Out: Performance details		
Preconditions	The contract exists in the system and performance has previously been recorded		
Post-condition (success end)	Performance report is updated		
Post-condition (failed end)	Performance report is not updated or process is cancelled		
Actor(s)	Administrator, user		
Trigger	Change in the performance status of a contract		
Description (event flow)	Actor action	System respond	Affected data object with operation
	1. Request to update details of performance of contract	2. Displays contract details page via rich user interface.	Queries database for 1 performance details
	3. Update details about performance of contract and click Save	4. Save new information	Update the performance of contract in the database.

Table 3.8: Use Case Narrative for Add Payment

Use Case 8	Add Payment		
Goal in content	To record payment of a contractor		
Level	This is a basic Record payment use case		
Parameters	In: Contract ID Out: Contract performance details		
Preconditions	Performance has been recorded for the contract		
Post-conditions (success end)	Payment is recorded		
Post-conditions (failed end)	Payment cannot be recorded		
Actor(s)	Administrator, user		
Trigger	Contractor is to be paid for work done on a contract.		
Description (event flow)	Actor action	System respond	Affected data object with operation
	I. Request to record payment to a contractor	2. Displays performance details and payment interface	Queries database for performance details
	3. Enter payment details and click Save	4. Save payment information	Save information in the database.

Table 3.9: Use Case Narrative for Edit Payment

Use Case 9	Edit Payment		
Goal in content	To edit payment of a contractor		
Level	This is a basic Edit payment use case I		
Parameters	In: Contract ID Out: Contract payment details		
Preconditions	Payment has been recorded for the contract		
Post-conditions (success end)	Payment is updated		
Post-conditions (failed end)	Payment cannot be updated		
Actor(s)	Administrator, user		
Trigger	Payment to a contractor is to be updated		
Description (event flow)	Actor action	System respond	Affected data object with operation
	1. Request to update payment on a contract	2. Displays payment details via rich user interface	Queries database for payment details
	3. Enter new payment details and click Save	4. Update payment information	Update information in the database.

Table 3.10: Use Case Narrative for Add User

Use Case 10	Add User		
Goal in content	To add a system user		
Level	This is a basic Add use case		
Parameters	In: User name, password		
Preconditions	Administrator is a genuine staff of the company		
Post-conditions (success end)	User is added		
Post-conditions (failed end)	User cannot be added		
Actor(s)	Administrator		
Trigger	New user is to be added to the system.		
Description (event flow)	Actor action	System respond	Affected data object with operation
	1. Request to add a user record	2. Displays add user page via rich interface	Queries database for performance details
	3. Enter user details and click Add	4. Save user information	Save information in the database.

Table 3.11: Use Case Narrative for Delete User

Use Case 11	Delete User		
Goal in content	To delete a system user		
Level	This is a basic Delete use case I		
Parameters	In: User name		
Preconditions	Administrator is a genuine staff of the company		
Post-conditions (success end)	User is deleted		
Post-conditions (failed end)	User cannot be deleted		
Actor(s)	Administrator		
Trigger	New user is to be deleted from the system.		
Description (event flow)	Actor action	System respond	Affected data object with operation
	1. Request to delete user details	2. Displays delete user interface	Queries database for performance details
	3. Enter user details and click Delete	4. Delete user information	Delete user information in the database.

Table 3.12: Use Case Narrative for Update User

Use Case 12	Update User		
Goal in content	To update a system user's details		
Level	This is a basic Update use case		
Parameters	in: User name		
Preconditions	Administrator is a genuine staff of the company		
Post-conditions (success end)	User details are successfully changed		
Post-conditions (failed end)	User details cannot be changed		
Actor(s)	Administrator		
Trigger	User name or password is to be changed		
Description (event flow)	Actor action	System respond	Affected data object with operation
	1. Request to update user details	2. Displays update user interface	Queries database for performance details
	3. Enter new name or password details and click Update	4. Update user information	Update user information in the database.

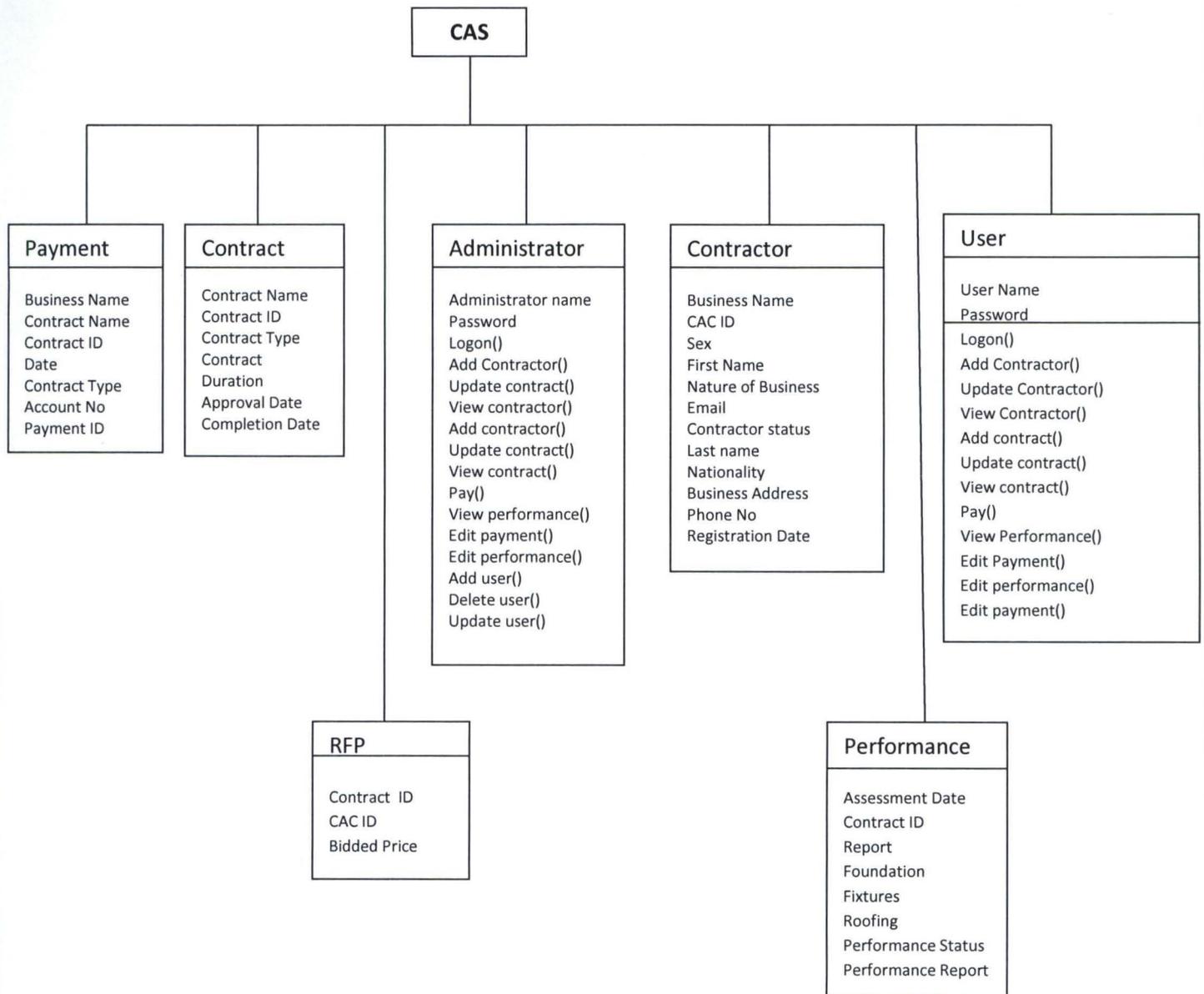
Table 3.13: Use Case Narrative for Add RFP

Use Case 13	Add RFP		
Goal in content	To record a contractor's request for proposal		
Level	This is a basic Add use case		
Parameters	In: CAC ID, bid price		
Preconditions	Company is duly registered with CAC		
Post-conditions (success end)	RFP is recorded		
Post-conditions (failed end)	RFP is not recorded		
Actor(s)	Administrator, user		
Trigger	Contractor bids for a contract		
Description (event flow)	Actor action	System respond	Affected data object with operation
	1. Request to add RFP	2. Displays Add RFP interface	Reads from RFP table in the database
	3. Enter CAC ID and bid price and click Save	4. Record RFP	Save REP in the database.

Table 3.14: Use Case Narrative for View Records

Use Case 14	View Records		
Goal in content	To view records of a RFP, contract, contractor, payment and performance		
Level	This is a basic View use case		
Parameters	In: RFPID, Contract ID, CAC ID, Out: View of relevant record		
Preconditions	RFP, contract, contractor, payment and performance record exists		
Post-conditions (success end)	Record is viewed		
Post-conditions (failed end)	Record is not viewed		
Actor(s)	Administrator, user		
Trigger	Audit of record is to be taken		
Description (event flow)	Actor action	System respond	Affected data object with operation
	1. Request to view record	2. Displays View interface	Reads from views in the database
	3. Enter relevant parameters and click View or View all	4. View record	Get relevant view

CLASS DIAGRAM



CHAPTER FOUR

DESIGN IMPLEMENTATION

4.1 Introduction

System implementation is the very last stage of the system development. It is the embodiment of all the other stages. The implementation process covers areas such as the phases of programming, system specification, system testing, system installation, and post implementation evaluation and the physical display of how the system works.

This chapter describes each of the program modules that make up the system, their functions, how the system can be deployed, the tools used, and reasons for the choice.

4.2 System Requirements

System requirements are the minimum standard that a proposed system demands before it can work effectively and efficiently.

4.3 Hardware Requirements

- 128MB of RAM (minimum)
- 10GB Hard Disk (minimum)
- 32MB of Video Graphics Adapter (VGA)
- Printer (Optional)
- Monitor

- Keyboard
- 1.0GHz processor and above
- UPS (Uninterruptible power supply)

4.4 Software Requirements

Operating System: Microsoft Windows 98 and above

- Virtual Basic
- Microsoft Access

4.5 Program Modules

There are nine (9) basic modules contained in this system are as follows:

- 1) Administration Module
- 2) Contract Activity Module
- 3) Contractor Module
- 4) Allocation Module
- 5) Performance Module
- 6) Payment Module
- 7) View Module
- 8) RFP module

9) User Management Module

4.5.1 Login Module

This is the first page on the system that the user comes in contact with and is a logon screen which grants users access to the system. It serves as an entry point to the system.

A user can either logon as a User or an Administrator.

A user has to be authenticated before access is granted to the system via the use of User name and password.

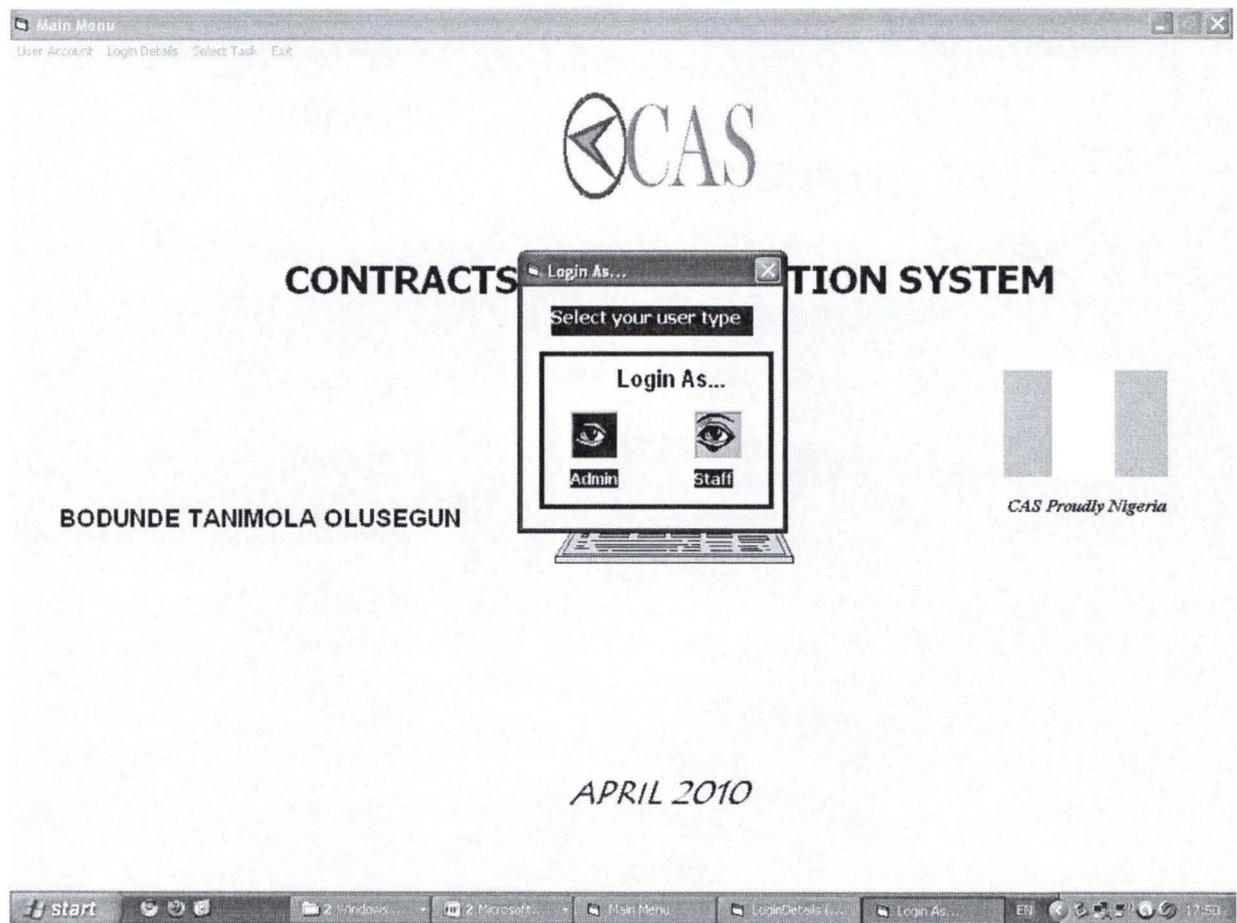


Fig. 4.1: Login page.

4.5.2 Contract Activity Module

This module deals with all activities relating to a contract. Under this module, the user can add a new contract and edit details of an existing contract.

To add a contract, the user clicks on Add Contract to display the New Contract form. The user then enters the contract details and then clicks Allocate to save the record in the database.

To edit details of a contract, the user clicks on Edit Contract to display the Edit Contract form, and then enters the Contract ID from where the contract can be edited. The user then adds new information in the second part of the form and clicks Update to save the record in the database.

4.5.3 Contractor Module

This module deals with recording information about contractors who do business with the organization. Under this module, the user can add a new contractor and edit details of an existing contractor.

To add a contractor, the user clicks on Add Contractor to display the Registration form, enters the contractor details and clicks Save to save the record in the database

To edit details of a contractor, the user clicks on Edit Contractor to display the Edit Contract form, enters the contractor's CAC ID which causes the contractor's details to

be displayed, then adds new information in the second part of the form and clicks Update to save the record in the database

The screenshot shows a software window titled "Contract Registration" with a sub-header "NEW CONTRACT ALLOCATION". The form is organized into two main sections: "Company Details" and "Contract Information".

Company Details:

- CAC ID: [Text Input]
- Business Name: [Text Input]
- Address: [Text Input]
- Nature of Business: [Text Input]
- Nationality: [Dropdown Menu]

Contract Information:

- First Name: [Text Input]
- Last Name: [Text Input]
- Sex: [Dropdown Menu]
- Date of Registration: [Date Picker (1/1/1990)]
- Contractor Status: [Dropdown Menu (0-Inactive, 1-Active)]
- Bank Name: [Text Input]
- Account Type: [Dropdown Menu]
- Account No: [Text Input]
- Phone Number: [Text Input]
- E-mail: [Text Input]

At the bottom of the form are three buttons: "Register", "Clear", and "Close". The window's taskbar shows the Start button and several open applications, including "CHAPTER FOUR (Co..." and "5 Contract Adminst...".

Fig. 4.2: Contract Registration Form.

4.5.4 Allocation Module

This performs the same function as the Edit Contract sub module of the Contract Activity module. It is designed as a form of shortcut to edit the details of a contract specifically to change the contractor that a contract is awarded to.

NEW CONTRACT ALLOCATION

Contract ID

Contract Name

Contract Type

Contract Approval Date

Contract Duration (Months)

Expected Completion Date

CAC ID

Amount Due

Allocation Status

Contract Status

0-Inactive, 1-Active

CAS Proudly Nigeria

Fig. 4.3: New Contract Allocation Form

4.5.5 Performance Module

This module enables the performance of a contract to be tracked over the period of time that the contract is active. Under this module the user can add a new performance record or update an existing record as the job progresses.

To add a new performance record, the user clicks on Add Performance to display the Add Performance form, then enters the performance details and clicks Save to save the record in the database.

To edit the performance record of a contract whose performance details have already been recorded, the user clicks on Edit Performance to display the Edit Performance form. The user then enters the Contract ID which causes the performance details of the contract to be displayed, then adds new information in the second part of the form and clicks Update to save the record in the database.

The screenshot shows a web browser window titled "Performance Report" with a menu bar containing "New", "Edit Record", and "Close". The main content area displays a form titled "NEW PERFORMANCE REPORT" with a logo on the left. The form contains the following fields and controls:

- Contract ID**: A text input field.
- CAC ID**: A text input field.
- Foundation**: A dropdown menu.
- Roofing**: A dropdown menu.
- Fixtures**: A dropdown menu.
- Performance Status**: A text input field.
- Date of Assessment**: A date picker showing "1 / 1 / 1990".
- Performance Analysis Report**: A large text area with a scroll bar.

On the right side of the form, there is a logo for "CAS Proudly Nigeria" consisting of two vertical bars and the text "CAS Proudly Nigeria".

At the bottom of the browser window, the taskbar shows the "start" button, several open applications including "Windows Explorer", "CHAPTER FOUR | Co...", and "Contract Administ...", and the system tray with the time "12:14".

Fig. 4.4: Performance Report Form

4.5.6 Payment Module

This module facilitates the recording of payment to a contractor for the work done. Here the user can add a new payment record or update payment on a certain contract.

To add a new payment record, the user clicks on Add Payment to display the New Payment form, and then enters the Contract ID of the contract which causes the performance details of the contract to be displayed. The user then enters the payment details in the second part of the form and clicks Save to save the record in the database.

To update the payment record of a contract for which some payment has been made, the user clicks on Edit Payment to display the Edit Payment form. The user then enters the Contract ID which causes the performance details of the contract to be displayed along with the former payment details. The user then adds new information in the second part of the form and clicks Update to save the record in the database.

Make Payment

PAYMENT

Contract ID

CAC ID

Performance Status Contract Status

Contractor Status Contract Approval Date

Contract Duration

Allocation Status

Date of Last Assessment

Payment Category

Payment Status

CAS Proudly Nigeria

Make Payment

Payment Detail

CAC ID Amount Due Amount

Bank Name Payment Date Payment Status

Type of Account Payment Category

Account Number

start Windows Explorer CHAPTER FOUR (C... Contract Admin... 12:19

Fig. 4.5: Payment Form

4.5.7 View Module

This module allows users to view details and the option of printing the result about contracts and contractors and their activities on the system such as performance and payment.

To view details of a contract, the user clicks on View Contract to display the View-Contract form, then enters the Contract ID of a contract of interest and then clicks View Details to display details of the contract.

To view details of a contractor, the user clicks on View Contractor to display the View Contractor form, enter the CAC ID of the Contractor of interest then clicks View Details to display details of the contractor.

To view payment details of a contract, the user clicks on View Payment to display the View Payment form, enter the Contract ID of a contract whose payment record of interest then clicks View Details to display payment details of the contract.

To view audit trails or logs the administrator clicks on view log to display the view page. He can then click on login log to view the details of who login, what time, what date as a security measure. He can also click on the Registration log to view registered contractor by the User, CAC ID of the contractor. Bank Name the contractor is using, the time and date of registration. He can also click on Payment log to view CAC ID of the contractor that is to be paid, account number of the contractor, the bank name, the payment time, and payment date All these are for security measures because all these audit trails or logs have a security policy of read only mode.

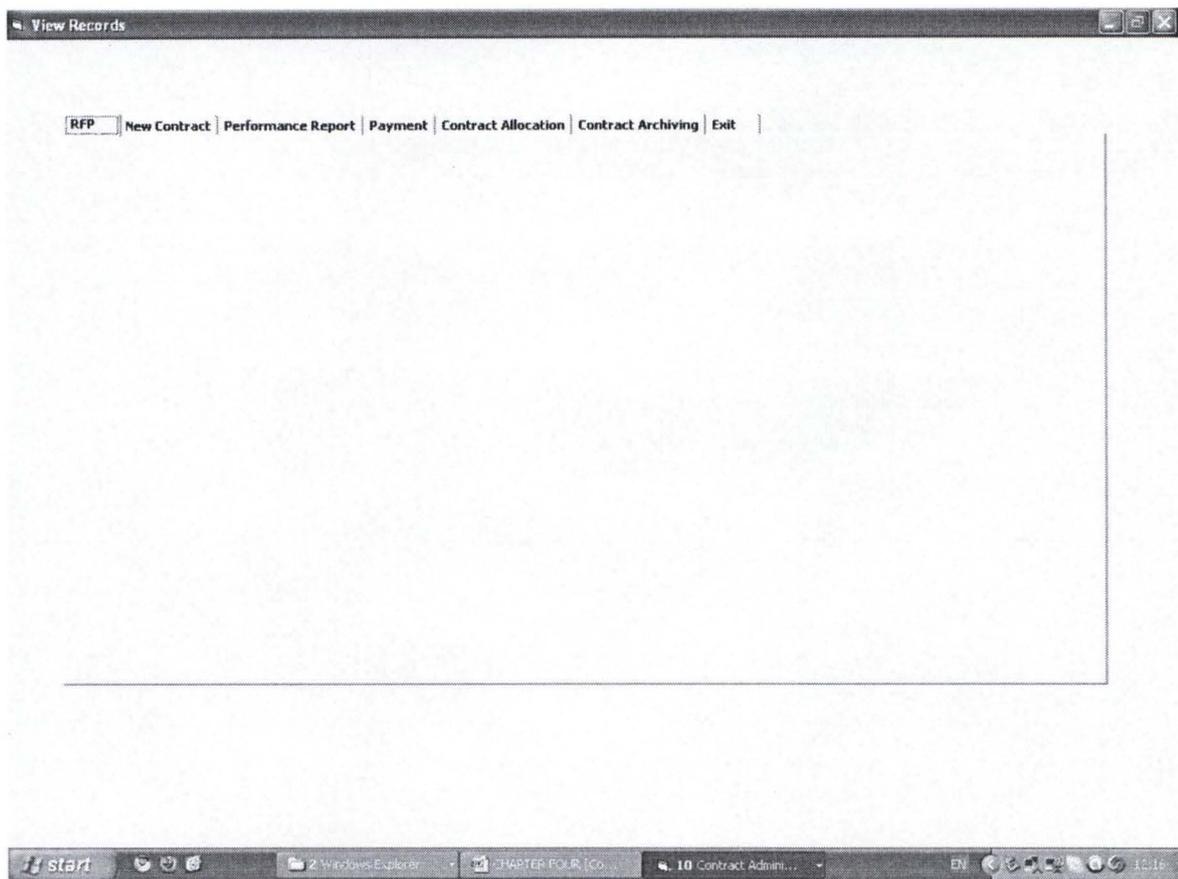


Fig. 4.6: View Record Page.

4.5.8 Request for Proposal Module

This module facilitates the record of proposals from contractors bidding for a particular contract; it allows the user to enter the details of contractor's bids for a contract.

To record a Request for Proposal (RFP), the user clicks on Add RFP which displays the Add RFP page. He then enters the details of the proposal/bid and clicks Save to save the record of the proposal in the database.

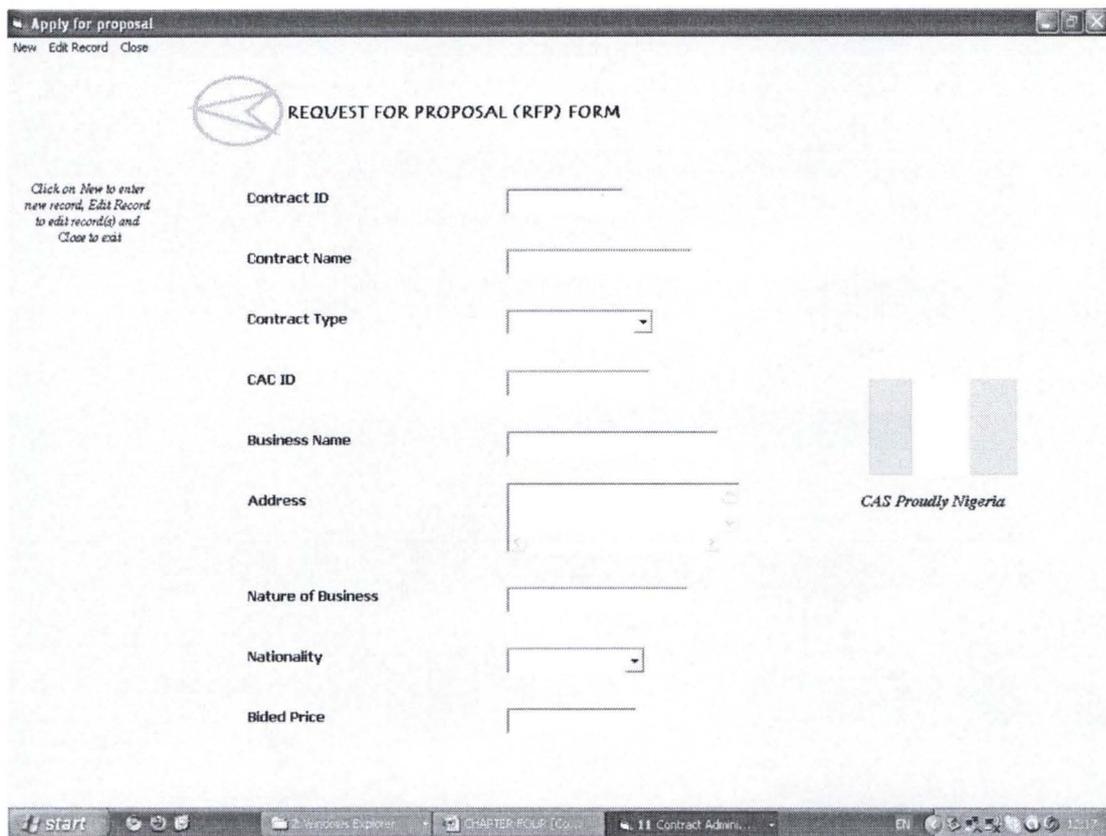


Fig. 4.7: Request for Proposal Form.

4.5.9 User Management Module

This module is available only to the Administrator of the system. It grants the administrator the privilege of adding new users, deleting existing users as well as updating user information.

To add a new user, the administrator clicks on Add User which displays the Add User page. He then enters the details for the new user and clicks Save to save the record in the database

To delete an existing user, the administrator clicks on Delete User which displays the Delete User page, enters the user name of the user to be deleted and clicks Delete to delete the record in the database.

To update a user's information, the administrator clicks on Update User which displays the Update User page. He then changes user name and password of the user and clicks Update to update the record in the database.

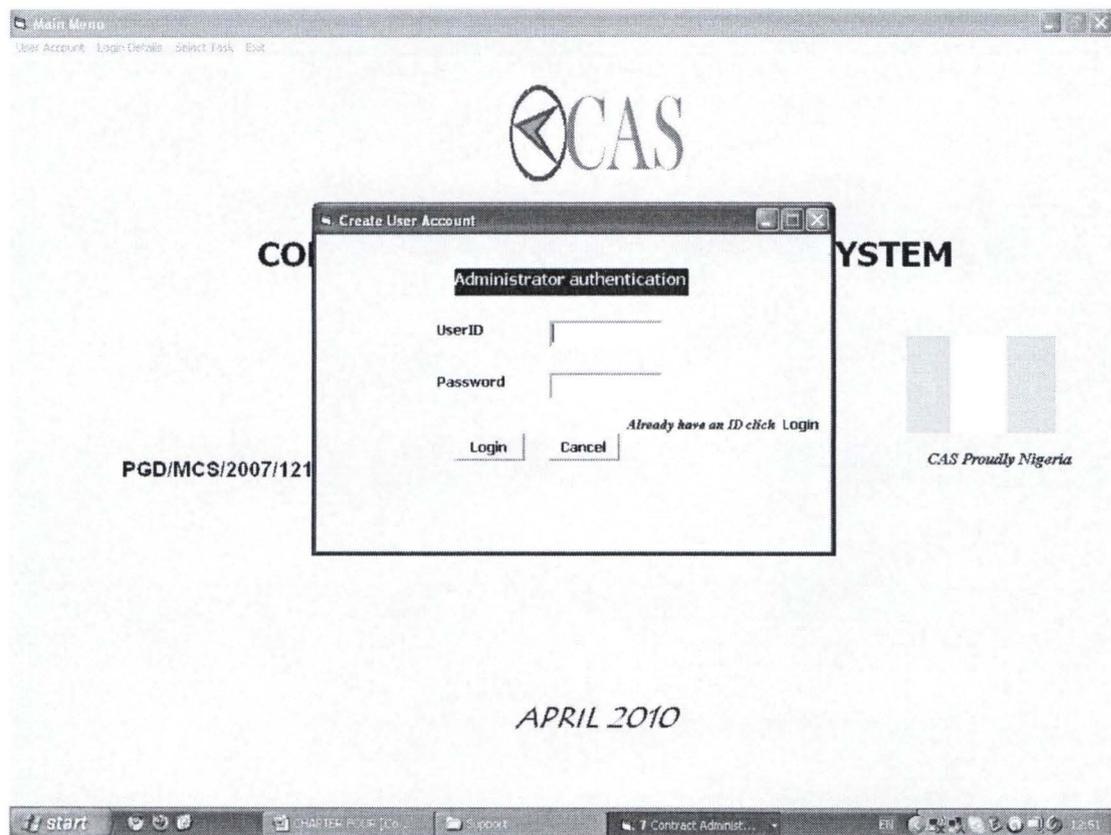


Fig. 4.8: Administration Authentication page.

4.6 Choice of Programming Tools

The system was implemented using the following tools:

- 1) Virtual Basic
- 2) Microsoft Access

The project was implemented using Virtual Basic as the programming language and Microsoft Access as the database query language used in the design of the database of the organization and keeping records and information.

- The structure of the Basic programming language is very simple, particularly as to the executable code.
- *VB* is not only a language but primarily an integrated, interactive development environment ("IDE").
- The *VB-IDE* has been highly optimized to support rapid application development ("*RAD*"). It is particularly easy to develop graphical user interfaces and to connect them to handler functions provided by the application.
- The graphical user interface of the *VB-IDE* provides intuitively appealing views for the management of the program structure in the large and the various types of entities (classes, modules, procedures, forms ...).
- *VB* provides a comprehensive interactive and context-sensitive online help system.

- When editing program texts the "IntelliSense" technology informs you in a little popup window about the types of constructs that may be entered at the current cursor location.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Summary

Contract administration is very critical to every business organization, as the efficient allocation and execution of contracts is a top priority. Therefore, an efficient process of managing the process of contract administration is inevitable to ensure the smooth running of the business.

The contract administration system provides facilities for the recording of bids on a contract, allocation of contracts, record of performance, execution and payment to the contractor. The system is intended for use in government organizations

5.2 Conclusion

A good contract administration program is essential to improving contractor performance under federal contracts. The implementation of the system designed in the course of this project will help the process of contract administration in the following ways: making the process faster and more streamlined, reducing paperwork, ensure proper documentation of all details regarding a contract, reducing unnecessary mistakes in recording details and limiting the chances of fraudulent acts to the barest minimum, However, it is worthy of note that while every effort has been made to provide a system which would check fraud, errors and other vices plaguing the administration of contracts in Nigeria, corruption starts and ends with the human element in any process

and until this is successfully dealt within the workers interacting with this and any other automated system, it cannot be completely eradicated.

I believe that contracting officials need to realize the importance of good contract administration. In addition, giving an annual contract administration award to recognize individual and group accomplishments in contract administration highlights it's important to the procurement process.

5.3 Recommendations

Based on the intended scope of work of this project, the developers would like to make the following recommendations as to the use and scope for further development of the Contract Administration System:

1. Enforcement, Performance Assessment, Monitoring and Documentation

Policies: The Contract Administrator should enforce performance assessment, monitoring and documentation of contract been awarded. Business models should be developed that will stand as guidelines based upon the various major categories of contracts to assist the organization.

2. Contractor Performance Information File: The contract administrator should require contractor to submit a record of complaints and problems encountered during a contract execution. A post-contract evaluation should be conducted by the evaluation administrator to rate the contractor's performance, strengths and weaknesses. This documentation should be well documented.

3. Performance Evaluation Criteria: The method of evaluating performance on a contract may vary among different organizations and so each organization may use a format best suited for it. This may mean adding, deleting or modifying the criteria set by the developers.

4. Communication and Networking: It would be a worthwhile endeavor to develop a web based system using the present system as a model. This would enable a wider pool of members of an organization as well as other interested parties have access to the system and administrators to control the system from anywhere in real time. This has the advantage of making the company's transactions transparent. It would also enable closer links with the Corporate Affairs Commission (CAC) which keep an online database of all registered organization.

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APPENDIX

```
Private Sub ChgPass_Click()  
frmChangePass.Show  
frmChangePass.cmdChange.Visible = True  
frmChangePass.cmdDelete.Visible = False  
frmChangePass.Label2.Visible = True  
frmChangePass.Label3.Visible = False  
End Sub
```

```
Private Sub CrtUAcct_Click()  
frmCrtUser.Show  
End Sub
```

```
Private Sub DelUAcct_Click()  
frmChangePass.Show  
frmChangePass.cmdChange.Visible = False  
frmChangePass.cmdDelete.Visible = True  
frmChangePass.Label2.Visible = False  
frmChangePass.Label3.Visible = True  
End Sub
```

```
Private Sub Ext_Click()  
Unload Me  
End Sub
```

```
Private Sub Form_Unload(Cancel As Integer)  
End
```

End Sub

Private Sub LngDetail_Click()

frmLogDet.Show

End Sub

Private Sub Timer1_Timer()

Image1.Visible = False

Image2.Visible = True

Timer2.Enabled = True

Timer1.Enabled = False

End Sub

Private Sub Timer10_Timer()

Label4.Visible = False

Label3.Visible = True

Label5.Visible = False

Timer9.Enabled = False

Timer8.Enabled = True

Timer10.Enabled = False

End Sub

Private Sub Timer2_Timer()

Image2.Visible = False

Image3.Visible = True

Timer3.Enabled = True

```
Timer2.Enabled = False
```

```
End Sub
```

```
Private Sub Timer3_Timer()
```

```
Image3.Visible = False
```

```
Image1.Visible = True
```

```
Timer1.Enabled = True
```

```
Timer3.Enabled = False
```

```
End Sub
```

```
Private Sub Timer4_Timer()
```

```
a = a + 40
```

```
Label1.Left = Label1.Left + a
```

```
If Label1.Left = 9000 Then
```

```
Label1.Left = Label1.Left + a
```

```
End If
```

```
End Sub
```

```
Private Sub Timer5_Timer()
```

```
a = a + 40
```

```
Label1.Left = Label1.Left - a
```

```
If Label1.Left = 9000 Then
```

```
Label1.Left = Label1.Left - a
```

```
End If
```

```
End Sub
```

```
Private Sub Timer6_Timer()  
Timer4.Enabled = False  
Timer5.Enabled = True  
End Sub
```

```
Private Sub Timer7_Timer()  
Timer4.Enabled = True  
Timer5.Enabled = False  
End Sub
```

```
Private Sub Timer8_Timer()  
Label3.Visible = False  
Label4.Visible = True  
Label5.Visible = False  
Timer9.Enabled = True  
Timer8.Enabled = False  
Timer10.Enabled = False  
End Sub
```

```
Private Sub Timer9_Timer()  
Label3.Visible = False  
Label5.Visible = True  
Label4.Visible = False
```

```
Timer9.Enabled = False  
Timer8.Enabled = False
```

```
Timer10.Enabled = True
```

```
End Sub
```

```
Private Sub Tsk_Click()
```

```
frmCrtAs.Show
```

```
End Sub
```

```
Private Sub cmdClose_Click()
```

```
Unload Me
```

```
End Sub
```

```
Private Sub cmdPrint_Click()
```

```
PrintForm
```

```
End Sub
```

```
Sub DeleteX()
```

```
Dim stam As String
```

```
ans = MsgBox("Really want to change your password", vbYesNo + vbQuestion,  
"Change Password")
```

```
If ans = vbYes Then
```

```
l: stam = InputBox("Enter new password:")
```

```
    If Len(stam) = 0 Then Exit Sub
```

```
    If Len(stam) < 6 Then
```

```
        MsgBox "The password must be up to six characters.", vbInformation + vbOKOnly,  
        "Change password"
```

GoTo 1

Else

txtPassC.Text = stam

Dim dbs As Database, rst As Recordset

' Modify this line to include the path to Northwind

' on your computer.

Set dbs = OpenDatabase(App.Path & "\contract.mdb")

' Delete employee records where title is Trainee.

dbs.Execute "DELETE * FROM " _

& "useracct WHERE userid = " & lstUser.Text & " ;"

dbs.Close

With Data2.Recordset

.AddNew

!userid = lstUser.Text

!password = txtPassC.Text

!retype = txtPassC.Text

!surname = Text1.Text

!othername = Text2.Text

!Date = Text3.Text

!Time = Text4.Text

```
.Update
```

```
MsgBox ("You've successfully change your password")
```

```
End With
```

```
picOutput.Refresh
```

```
lstUser.Clear
```

```
End If
```

```
End If
```

```
End Sub
```

```
Sub DeleteY()
```

```
Dim stm As String
```

```
ans = MsgBox("Really want to delete your account", vbYesNo + vbQuestion, "Delete  
user account")
```

```
If ans = vbYes Then
```

```
Dim dbs As Database, rst As Recordset
```

```
' Modify this line to include the path to Northwind
```

```
' on your computer.
```

```
Set dbs = OpenDatabase(App.Path & "\contract.mdb")
```

```
' Delete employee records where title is Trainee.
```

```
dbms.Execute "DELETE * FROM " _  
    & "useracct WHERE userid = " & lstUser.Text & " ;"
```

```
dbms.Close
```

```
MsgBox "Your account has been deleted", vbOKOnly + vbInformation, "Delete user  
account"
```

```
picOutput.Refresh
```

```
lstUser.Clear
```

```
Label4.Visible = True
```

```
Else
```

```
If ans = vbNo Then
```

```
frmChangePass.Data1.Refresh
```

```
End If
```

```
End If
```

```
End Sub
```

```
Private Sub cmdChange_Click()
```

```
On Error GoTo err
```

```
DeleteX
```

```
Exit Sub
```

```
err:
```

```
MsgBox "Select your user id."
```

End Sub

Private Sub cmdClose_Click()

Unload Me

End Sub

Private Sub cmdDelete_Click()

On Error GoTo err

DeleteY

Exit Sub

err:

MsgBox "Select your user id."

End Sub

Private Sub cmdGDetail_Click()

Dim dbstudent As Database

Dim rststudent As Recordset

Dim strregno As String

Dim rBookmark As Variant

strregno = Trim\$(txtPass.Text)

Set dbstudent = OpenDatabase(App.Path & "\contract.mdb")

Set rststudent = dbstudent.OpenRecordset(_

"SELECT password,userid,surname,othername " & _

"FROM useracct ORDER BY password", _

```
dbOpenDynaset)
```

```
' Get user input and build search string.
```

```
stregno = Trim$(txtPass.Text)
```

```
If stregno = "" Then
```

```
MsgBox "Please enter your old password"
```

```
Else
```

```
stregno = "password = " & stregno & ""
```

```
With rststudent
```

```
  ' Populate recordset.
```

```
  rBookmark = .Bookmark
```

```
  ' Find first record satisfying search string. Exit
```

```
  ' loop if no such record exists.
```

```
  .FindFirst stregno
```

```
  If .NoMatch Then
```

```
    MsgBox "No account found with " & _  
      stregno & "."
```

```
.Bookmark = rBookmark
```

```
Else
```

```
lstUser.AddItem !userid
```

```
Text1.Text = !surname
```

```
Text2.Text = !othername
```

End If

End With

End If

txtPass.Text = ""

 rststudent.Close

 dbsstudent.Close

End Sub

Private Sub cmdRefresh_Click()

 Data1.Refresh

End Sub

Private Sub Form_Load()

 With Data1

 .DatabaseName = App.Path & "\contract.mdb"

 .RecordSource = "SELECT userid, password FROM useracct"

 .Refresh

 End With

 With Data2

 .DatabaseName = App.Path & "\contract.mdb"

 .RecordSource = "useracct"

 .Refresh

 End With

```
Text3.Text = Date
```

```
End Sub
```

```
Private Sub Form_MouseMove(Button As Integer, Shift As Integer, X As Single, Y As Single)
```

```
Label4.FontUnderline = False
```

```
End Sub
```

```
Private Sub Label4_Click()
```

```
frmCrtUser.Show
```

```
Unload Me
```

```
End Sub
```

```
Private Sub Label4_MouseMove(Button As Integer, Shift As Integer, X As Single, Y As Single)
```

```
Label4.FontUnderline = True
```

```
End Sub
```

```
Private Sub lstUser_Click()
```

```
On Error GoTo err
```

```
Dim found As Boolean
```

```
found = False
```

```
picOutput.Cls
```

```
'move through the database until correct user name is found
```

```
With Data1.Recordset
```

```
    .MoveFirst
```

```

Do Until .EOF
    If lstUser.Text = .Fields("userid").Value Then
        found = True
        'print username, and old password
        picOutput.Print ; " UserNAME:"; Tab(18); lstUser.Text
        picOutput.Print "Password:"; Tab(18); .Fields("password").Value
    Exit Do
End If
.MoveNext
Loop
End With
Exit Sub

End Sub

Private Sub Timer1_Timer()
Text4.Text = Time
End Sub

Private Sub Timer2_Timer()
Dim ab As Long
ab = QBColor(Rnd * 15)
Label4.ForeColor = ab
End Sub

Private Sub cmdAdd_Click()
If txtConID.Text = "" Then

```

```
MsgBox "All fields required", vbOKOnly + vbInformation, "Contract Archiving"
```

```
lblConID.Visible = True
```

```
lblConName.Visible = False
```

```
lblConType.Visible = False
```

```
ElseIf txtConName.Text = "" Then
```

```
MsgBox "All fields required", vbOKOnly + vbInformation, "Contract Archiving"
```

```
lblConID.Visible = False
```

```
lblConName.Visible = True
```

```
lblConType.Visible = False
```

```
ElseIf cmbConType.Text = "Select Type" Then
```

```
MsgBox "All fields required", vbOKOnly + vbInformation, "Contract Archiving"
```

```
lblConID.Visible = False
```

```
lblConName.Visible = False
```

```
lblConType.Visible = True
```

```
Else
```

```
Dim dbsNorthwind As Database
```

```
Dim rstCustomers As Recordset
```

```
Dim strpass As String
```

```
Dim rBookmark As Variant
```

```
Set dbsNorthwind = OpenDatabase(App.Path & "\contract.mdb")
```

```
Set rstCustomers = dbsNorthwind.OpenRecordset( _
```

```
"SELECT contractid,contractname,contracttype " & _
```

```
"FROM contractarchiving ORDER BY contractid", _
```

```

dbOpenDynaset)
    strpass = Trim$(txtConID.Text)

'check for any blank fields
If txtConID.Text = "" Or txtConName.Text = "" Or cmbConType.Text = "Select
Type" Then
    MsgBox "One of the fields is empty!", , "Warning!"

    frmConArc.Refresh
Else
    strpass = "contractid = " & strpass & ""

lblConID.Visible = False
lblConName.Visible = False
    lblConType.Visible = False

With rstCustomers

    ' Populate recordset.

    ' Find first record satisfying search string. Exit
    ' loop if no such record exists.
    .FindFirst strpass
    If .NoMatch Then

'display account to the user

```

```
MsgBox "Contract added", vbOKOnly + vbInformation, "Contract Archiving"
```

```
'display the user ID and password to user
```

```
contractid = Trim(LCase(txtConID.Text))
```

```
contractname = Trim(LCase(txtConName.Text))
```

```
contracttype = Trim(LCase(cmbConType.Text))
```

```
With Data1.Recordset
```

```
.AddNew
```

```
.Fields("contractid").Value = contractid
```

```
.Fields("contractname").Value = contractname
```

```
.Fields("contracttype").Value = contracttype
```

```
.Update
```

```
End With
```

```
txtConID.Text = ""
```

```
txtConName.Text = ""
```

```
cmbConType.Text = ""
```

```
Else
```

```
MsgBox "Contract with contractID" & " " & txtConID.Text & " " & "already existing,  
choose another ContractID", vbOKOnly + vbInformation, "Contract archiving"
```

```
End If
```

End With

End If

End If

End Sub

Private Sub cmdClose_Click()

Unload Me

End Sub

Private Sub Command1_Click()

txtConID.Text = ""

txtConName.Text = ""

cmbConType.Text = "Select Type"

End Sub

Private Sub Form_Load()

cmbConType.AddItem "Housing"

cmbConType.AddItem "Road"

cmbConType.AddItem "Others"

With Data1

.DatabaseName = App.Path & "\contract.mdb"

.RecordSource = "contractarchiving"

.Refresh

End With

End Sub

```
Private Sub Timer1_Timer()  
Label5.Visible = True  
Label4.Visible = False  
Timer2.Enabled = True  
Timer1.Enabled = False  
End Sub
```

```
Private Sub Timer2_Timer()  
Label5.Visible = False  
Label6.Visible = True  
Timer3.Enabled = True  
Timer2.Enabled = False  
End Sub
```

```
Private Sub Timer3_Timer()  
Label6.Visible = False  
Label4.Visible = True  
Timer1.Enabled = True  
Timer3.Enabled = False  
End Sub
```

```
Dim rsControls As New ADODB.Recordset  
Dim cnControls As New ADODB.Connection  
Private Sub cmdBack_Click()  
PrintForm  
End Sub
```

```
Private Sub cmdCancel_Click()
cmdFind.Enabled = True
cmdOk.Enabled = False
Text1.Visible = False
cmdCancel.Enabled = False
```

```
End Sub
```

```
Private Sub cmdDone_Click()
```

```
Unload Me
```

```
End Sub
```

```
Private Sub cmdFind_Click()
```

```
Text1.Visible = True
```

```
cmdOk.Enabled = True
```

```
cmdFind.Enabled = False
```

```
cmdCancel.Enabled = True
```

```
End Sub
```

```
Private Sub cmdOk_Click()
```

```
Dim dbsstudent As Database
```

```
Dim rststudent As Recordset
```

```
Dim strregno As String
```

```
Dim rBookmark As Variant
```

```
strregno = Trim$(Text1.Text)
```

```

Set dbsstudent = OpenDatabase(App.Path & "\contract.mdb")
Set rststudent = dbsstudent.OpenRecordset( _
    "SELECT
contractid,cacid,foundation,roofing,fixtures,performancestatus,dateofassessment,perfor
manceanalysis " & _
    "FROM performancereport ORDER BY contractid", _
    dbOpenDynaset)

' Get user input and build search string.

strregno = Trim$(Text1.Text)
If strregno = "" Then
    MsgBox "Please enter the contractID", vbInformation + vbOKOnly, "Find"

Else
    strregno = "contractid = " & strregno & ""

    With rststudent
        ' Populate recordset.
        rBookmark = .Bookmark
        ' Find first record satisfying search string. Exit
        ' loop if no such record exists.
        .FindFirst strregno
        If .NoMatch Then
            MsgBox "No record found with " & _
                strregno & "."
    End With

```

```
.Bookmark = rBookmark
```

```
Else
```

```
Text1.Text = !contractid
```

```
frmPerFind.Show
```

```
frmPerFind.Caption = "Performance Report of ContractID" & " " & Text1.Text
```

```
frmPerFind.txtConID.Text = !contractid
```

```
frmPerFind.txtCAC.Text = !cacid
```

```
frmPerFind.txtFound.Text = !foundation
```

```
frmPerFind.txtRoof.Text = !roofing
```

```
frmPerFind.txtFixt.Text = !fixtures
```

```
frmPerFind.txtPstatus.Text = !performancestatus
```

```
frmPerFind.txtDate.Text = !dateofassessment
```

```
frmPerFind.txtPerAna.Text = !performanceanalysis
```

```
End If
```

```
End With
```

```
End If
```

```
rststudent.Close
```

```
dbsstudent.Close
```

```
End Sub
```

```
Private Sub Form_Load()
```

On Error GoTo FindErr

Dim strQ As String

strQ = "provider=Microsoft.Jet.OLEDB.3.51;data source=" & App.Path &
"contract.mdb"

cnControls.Open strQ

rsControls.Open "select * from performancereport order by contractid", cnControls,
adOpenKeyset, adLockOptimistic

Set grdControls.DataSource = rsControls

Exit Sub

FindErr:

' If the database isn't found, use the FindDB function to find it.

If err.Number = -2147467259 Then

cnControls.Open "Provider=Microsoft.Jet.OLEDB.3.51;Data source=" &
FindDB("contract.mdb")

Resume Next

End If

Exit Sub

End Sub

Private Function FindDB(dbName As String) As String

On Error GoTo ErrHandler

' Configure cmdDialog in case the database can't be found.

With dlgFind

.DialogTitle = "Can't Find " & dbName

.Filter = "(*.MDB)*.mdb"

```

.CancelError = True 'Causes an error if user clicks on cancel
.ShowOpen
End With
' Test the string to ensure it's the sought database.
Do While Right(Trim(dlgFind.FileName), Len(dbName)) <> dbName
    MsgBox "File Name is not equal to " & dbName
    dlgFind.ShowOpen
Loop

FindDB = dlgFind.FileName ' return the full path.
Exit Function
ErrorHandler:
Select Case err.Number
Case 32755
    Unload Me
Case Else
    MsgBox err.Number & ": " & err.Description
End Select

End Function

```