COMPUTER APPROACH TO EQUIPMENT MAINTENANCE IN PARASTATAL

(A CASE STUDY OF FEDERAL TECHNICAL COLLEGE, OROZO)

BY

NMALAGU DAVID JOSEPH

PGD/MCS/2000/2001/1029

DEPARTMENT OF MATHEMATICS/COMPUTER SCIENCE

FEDERAL UNIVERSITY OF TECHNOLOGY

MINNA

APRIL, 2002

COMPUTER APPROACH TO EQUIPMENT MAINTENANCE IN PARASTATAL

(A CASE STUDY OF FEDERAL TECHNICAL COLLEGE, OROZO)

BY

NMALAGU DAVID JOSEPH
PGD/MCS/2000/2001/1029

A PROJECT SUBMITTED TO DEPARTMENT OF MATHEMATICS/COMPUTER SCIENCE, SCHOOL OF SCIENCE AND SCIENCE EDUCATION, FEDERAL UNIVERSITY OF TECHNOLOGY, MINNA. IN PARTIAL FULFILMENT OF REQUIREMENTS FOR THE AWARD OF POST GRADUATE DIPLOMA IN COMPUTER SCIENCE.

APRIL, 2002

I

ABSTRACT

This study investigated the computer approach to equipment maintenance in parastatal. A case study of Federal Technical College, Orozo.

It also looked at equipment maintenance in the departments, sections and workshops. It also looked at maintenance culture and the different classes of computers and their applications and how it aid decision-making in organizations and outlined the benefits that will accrue from computer approach to equipment maintenance.

It is the conclusion of this study that computer can act as an extension of both the hand and the brain, but cannot replace either. What it can do is tremendously increase the power of our designing.

TABLE OF CONTENTS

CHAPTER FIVE

FINDINGS AND RECOMMENDATIONS

CHAPTER ONE
BACKGROUND OF THE STUDY

1.1   INTRODUCTION

The college was founded in 1988 located at Orozo- Abuja. The college is headed by the principal and has 5 departments and 15 sections and 260 teaching and non-teaching staff and a population of 1000 students from year one to year three at present as a boarding students.

The departments and section are as follows

DEPARTMENTS	SECTIONS
(a) Business	(i) Book- Keeping
	(ii) Secretariat Studies
(b) Building and technical	(i) Brick, Block and Concreting
	(ii) Carpentry and Joinery
	(iii) Furniture Craft
	(iv) Painting and Decoration
(c) Mechanical	(i) Agric Mech
	(ii) Auto Mech
	(iii) Welding and Fabrication
	(iv) Printing
	(v) Mechanical Craft
(d) Electrical/Electronics	(i) Electrical Installation
	(ii) Radio and Television

4. Foster Nigeria unity with emphasis on the common tied that unites us in diversity.

5. Inspire students with desire for achievement and self-improvement.

All students irrespective of their callings (e.g. medicine, engineering, technology etc) will be exposed to both academics and pre-vocational courses. The specific objectives of the technical colleges are to develop in the students manipulative skills, otherwise known as manual dexterity, inventiveness respect for dignity of labour and above all a healthy attitude towards things technical at the same time students will be exposed to the usual basic academic course but with different orientation.

1.2 TECHNOLOGY

Technology can be defined in many ways. One definition includes its view as an applied science, which sees technology as a product. This is dearly insufficient as technology is essentially an activity. A more comprehensive definition tends to take into account both the process and product dimension. An example of such a definition is technology is the application of scientific and other knowledge to practical tasks by organizations that involve people and machines. The essential function for technology is education foundation refers to a planned action that could lead to technological development. This means that technology must be based on a sound education, which needs to begin at early age so that the recipients' minds are easily turned in the desired direction. Technology educators have recognized the fundamental direction in which technology education must proceed according to the report of the association of science education and science working party, cited in

Allsop and Wool Nough (1990) four strands of a balanced technological education have been identified.

These are :

(i) Technological litracy.

Students are exposed to the contents and methodologies of different technologies.

(ii) Technological awareness

This ensures that students are aware of the various implications of technological development.

(iii) Technological capacity

Students are encouraged to develop skills in tackling technological problem

(iv) Information technology

This should serve as an integral part of different subjects or as a tool for specific tasks

1.3 INTRODUCTORY TECHNOLOGY IN PERSPECTIVE

In Nigeria, the foundation for technology at the Junior Secondary School (JSS) and Federal Technical Colleges. Introductory technology content consist of components of technical drawing, metal work, wood work, electronics, applied electricity, building construction, auto mechanics, safety devices, engineering materials and food storage and preservation. These are presented as distinct but related components of technology emphasis are on exposition to both theory and work

shop practices with a view to acquiring knowledge and skills. This JSS program serves as the foundation for technology despite the existence of a handcraft curriculum at the primary science curriculum. In the National policy on education the objectives of introductory technology are.

(i)   To provide pre vocational orientation for further training in technology.

(ii)   To provide basic technological literacy for everyday living irrespective of sex, religion, social class or ethnic. Develop and project Nigerian culture, art and language as well as the words cultural heritage.

(iii)   Diversify the curriculum, to cater for a variety of talents, viz, the technically, commercially or academically oriented.

(iv)   Foster Nigerian unity with emphasis on the common ties that unites us in diversity and

(v)   Inspire students with desire for achievement and self-improvement. All students irrespective of their calling (e.g. medicine, engineering, technology etc) will be exposed to both academics and pre vocational courses and one or two Nigeria languages.

The specific objectives of the technical colleges are to develop in the student's manipulative skills, otherwise known as manual dexterity, inventiveness, respect for dignity of labour and above all a healthy attitude towards things technical. At the same time students will be exposed to the usual basic academic course but with different orientation

(v)   To stimulate creativity

Introductory technology unlike integrated science where themes and concepts could be used as factors to attaining integration in introductory technology distinct components of technology are merely brought together to form a single subject without a single strand running across them.

Introductory technology has general education goal which include

(a) Availability for every body

(b) Concerned with total personality

(c) Preparation for effective and efficient living irrespective of vocation.

1.4 PURPOSE OF THE STUDY

The main purpose of this study was to seek and develop a system that would ease the collection and storage of information on the equipment maintenance in Federal Technical College, Orozo, Secondary to provide harmonized information on equipment in the departments and sections within the school.

The main objectives are:

→   To study and analyze the activities and technology of the FTC Orozo

→   To observe the problems associated with the existing information storage systems in order to justify a need for a computerized tools maintenance Management systems.

→ To provide a logical and physical design of a computerized tools maintenance systems.

→ To describe the various operations of the proposed computerized systems and it's mode of operation.

→ To eliminate delays that occasions the retrieval of information on tools and equipment in the workshops.

→ To device a system that automatically generates a required form of report on tools and equipment in the college.

1.5   **METHODOLOGY**

The study employed both interview and the search of records. During the interview, information was obtained about the organizations objectives, equipment maintenance and problems with the existing systems.

The study also engaged in record search to obtain quantitative information that established how much reliance can be put on the estimates given by the staff and management during the interview session

1.6 SCOPE AND LIMITATIONS

Federal Technical College Orozo has 5 departments and 15 sections as earlier mentioned. The scope of this study was limited to the FTC Orozo only.

The study concentrated on determining the feasibility of redesigning and converting existing systems to new hardware and developing new applications for existing hardware. There would be no need to

convince management on the procuring of computers. The college has just bought some computers for training the staff and students. However, some of the staff with I inclusive have benefited from the program in computer appreciation and application introduced by Engineer P.E. Igoh.

1.7 DEFINITION OF TERMS.

COMPUTERS

A programmable electronic device or machine that can store, retrieve and process data for purpose, limited only by the creativity of the individual who use it.

MAINTENANCE

Maintenance refers to keep up, retain continue and keep in good order or working order of the equipment and tools in the workshop for use.

WORKSHOP

A workshop is a room or building in which productive work or manufacture on a small scale.

TECHNOLOGY

Technology is the application of scientific and other knowledge to practical tasks by organizations that involve people and machines.

CHAPTER TWO

LITERATURE REVIEW

2.0   EQUIPMENT AVAILABLE AND USES

EQUIPMENT	FUNCTIONS
PRINTING SECTIONS	
1. Offset Machine	To print document indirect.
2. Gluillofine	To gather printed document.
3. Collating machine	To cut and trim paper.
4. Folding machine	To fold, score and perforate
5. Stitching machine	To fasten paper together
6. Drilling machine	To make a hole.
7. Automatic Data binder	Gluing data together
8. Vertical camera	To produce negatives or positives
9. Plate maker	To expose plates.
10. Padding Press	To press bound books.
11. Copy proof machine	For proofing.
12. Letter press machine	For printing direct.
BOOK KEEPING / SECRETARIAT DUTIES	
13. Olympia Type Writer (Picker)	For typing (character is big)
14. Olympia Type Writer (Elite)	For typing (small character)
15. Olivetti Linea 98	For typing
AUTO MOBILE	
16. Plastic Disc Piece Cutter	To cut metals to any shape
17. Pneumatic Tyre Remover	To remove tyre
18. Wheel Balancing Machine	To balance wheels

19.	Elkon Machine U400	To analyze or detect any problem from the engine.
20.	Elkon Machine S300	
21.	Universal Headlight Adjustment "NOVATOR"	To adjust the headlight of vehicle
22.	Bench Drill	To drill metals
23.	Carburetor Testing Machine	To test carburetor
24.	Air Compressor Machine	To inflate tyre
25	Battery Charger	To charge battery
26	File Machine	For filing and sharpening
27	Power Control Machine	To control electric voltage
28	Testing overhead line Machine	To test cable line back and for ward voltage

FURNITURE CRAFT/CARPENTARY JOINERY

29	Turning Machine	Turning Wood to any shape
30	Plane Machine	For leveling wood surfaces
31	Circular Saw Machine	For circular sawing
32	Round Design Saw Machine	Round pattern, curve designs
33	Portable Jig or Sabre Saw	For straight, circular sawing
34	Cabinet Cleaning Machine	To clean metals before and after welding.
35	Hammers of several sizes and types	For straightening and bending metals
36	Power Hacksaws shears and power cut off saws	Are needed to cut standard size to needed lengths

37	Power operated shears	Equipped with different blades which make it possible to cut flat stock angle iron, bar stock to length
38	Chisels	Cut rivets, split nuts, chip castings and forging and cut thin metal sheets
39	Pliers	For cutting wire
40	Engine Lathes	Use for turning and screw cuttings
41	Universal Mill	For angular cut
42	Vertical Mill	For large flat surface

AGRIC. MECH.

43	Crawler Tractor	Used for primary cultivations and to break flesh land.
44	A sickle	This is used for harvesting crops.
45	Fertilizer distributor	For scattering seeds.
46	A ring roller	It consolidates the soil and break large surface lumps.
47	A hand sprayer	The nozzle emits a fine spray of chemicals in water. It is also used to apply insecticide.
48	Chain harrow	To cover seeds after planting To make a fine tilt.
49	A ridger	This is used for ridging.

| 50 | Tractor | Used for mounting implement such as sprayer, planter and disc harrow. |

GARMENT

51	Butterfly Design	For straight sewing.
52	Singer	For Industrial Sewing.
53	Over locking machine	For knitting the edge of clothes.
54	Philip Iron	For pressing clothes.

CATERING

55	Gas cooker	For cooking.
56	Electric Kettle	For boiling water.
57	Electric stove	For cooking.

2.1 MAINTENANCE CULTURE

The flow of events that occur as a result of a maintenance request are illustrated in the diagram given. If the only available element of a software configuration is source code, maintenance activity begins with the penin stacking evaluation of the code, often complicated by poor interval documentation. Subtle characteristics such as program structure, global data structures, system interface, (i.e. A yardstick by which the user judges system quality whether good or bad design). Performance and/or design constraints are difficult to ascertain and frequently misinterpreted. The ramifications or change that are ultimately made to the code are difficult to assess.

Regression tests (repeating past tests to assure that modifications have not introduced faults in previously operational software) are impossible to conduct because no record of testing exists. We are conducting unstructured maintenance and paying the price (in wasted effort and human frustration) that accompanies software that has not been developed using a well – defined methodology.

If a complete software configuration exists, the maintenance task begins with an evaluation of both design documentation. Important structural, performance and interface characteristics of the software are determined. The impact of required modifications or corrections is assessed and an approach is practiced. The design is modified and retrieved. New source code is developed, regression tests are conducted using information contained in the TEST SPECIFICATION, and the software is released again. This sequence of events constitutes **structured maintenance** and occurs as a result of the earlier application of a software engineering methodology. Although the existence of a software configuration does not guarantee problem-free maintenance, the amount of wasted effort is reduced and the overall quality of a change or correction is enhanced.

STRUCTURED VS UNSTRUCTURED MAINTENANCE
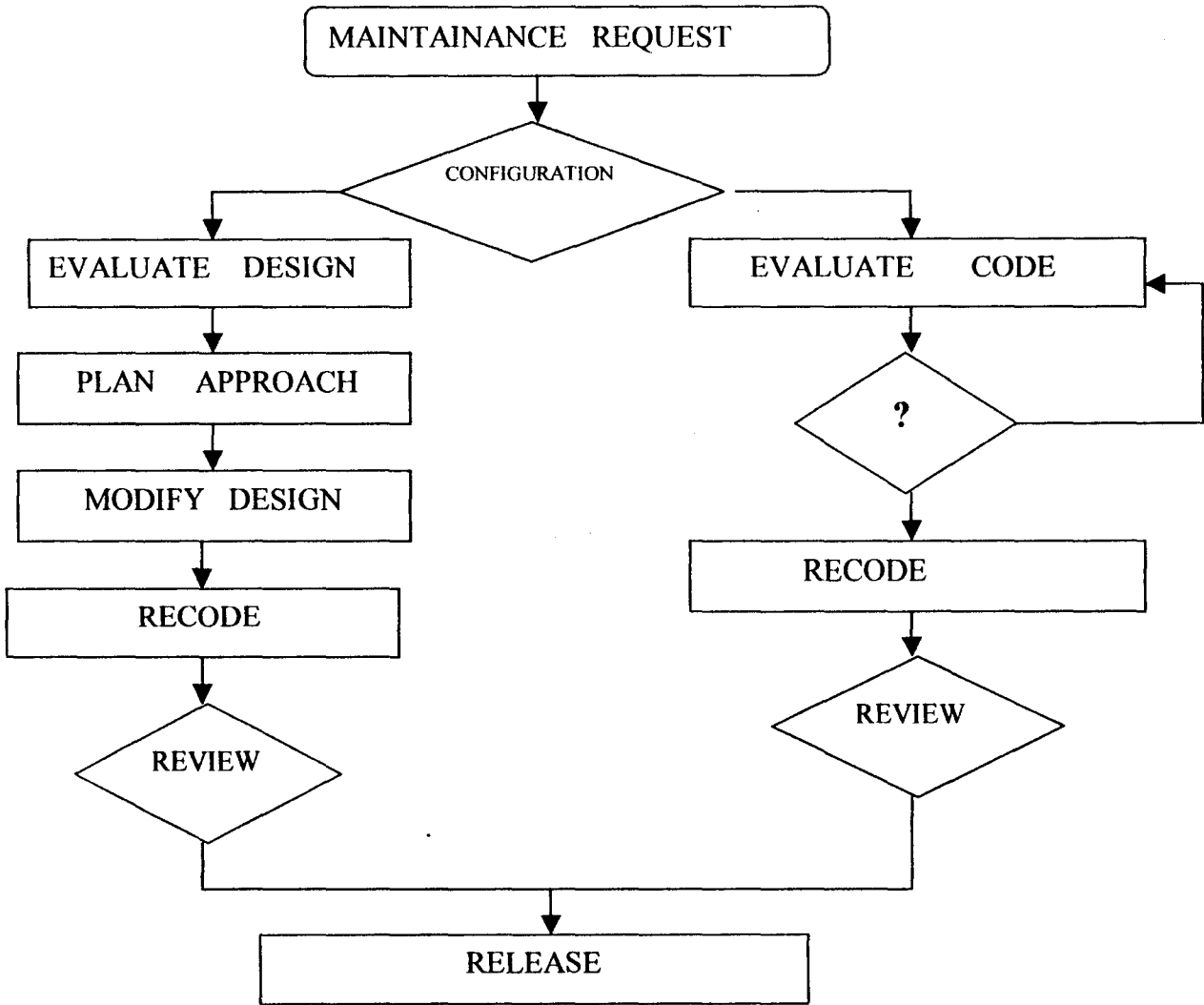
EQUIPMENT MAINTENANCE

As the term maintenance is widely and generally used, it will be used here to mean a program by correcting errors and providing new facilities.

Equipment maintenance falls into 4 activities that are undertaken after a program is released for use.

The first maintenance activity occurs because it is unreasonable to assume that software testing will uncover all latent errors in a large program, errors will occur because it is unreasonable to assume that software testing will uncover and be reported to the developer. The process that includes diagnosis and correction of one or more errors is called **CORRECTIVE MAINTENANCE.**

The second Maintenance activity occurs because of the rapid change encountered in every aspect of computing. New generations of hardware seem to be announced on 36-months cycle, new operating systems, and peripheral equipment and other system elements are frequently upgraded or modified. The useful life of application software, on the other hand, can easily surpass ten years, outliving the system environment for which it was originally developed. Therefore, ADAPTIVE MAINTENANCE, which is an activity that modifies to property interface with a changing environment, is both unnecessary and commonplace.

The third maintenance activity occurs when software package is successful.

As the equipment is used, recommendations for new capabilities, modifications to existing functions, and general enhancements are received from users. To satisfy request in this category, PERCEPTIVE MAINTENANCE is performed. This activity accounts for then majority of all efforts expended on equipment maintenance.

The fourth maintenance activity occurs when software is changed to improved future maintainability or reliability or to provide a better basis for future enhancements. This is often called
PREVENTIVE MAINTENANCE. This activity is still relatively rare in the software world.

DISTRIBUTION OF MAINTAINANCE ACTIVITIES

OTHERS   4%

ADAPTIVE
25%

PERFECTIVE
50%

CORRECTIVE 21%
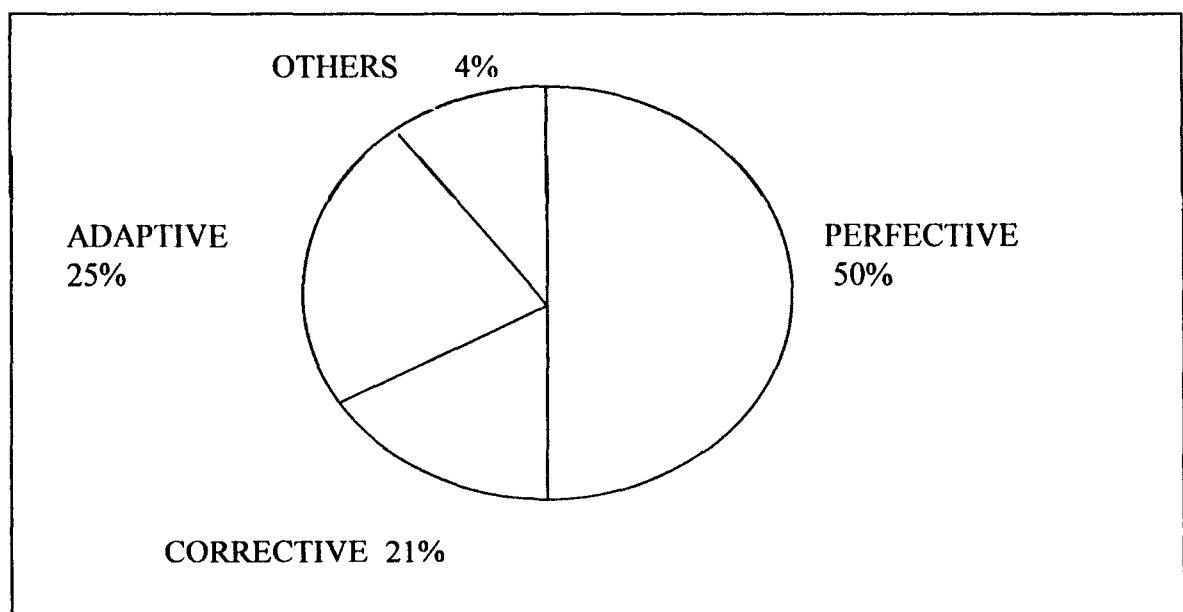
ORGANIZATIONAL CHART OF FED. TECH. COLLEGE - OROZO

```
                            ┌─────────────────────────────┐
                            │         PRINCIPAL           │
                            └─────────────────────────────┘
                                         │
        ┌────────────────────────────────┼────────────────────────────────┐
        │                                │                                │
┌───────────────────────┐      ┌──────────────┐      ┌──────────────────────┐
│ VICE PRINCIPAL        │      │   BUSARY     │      │ VICE PRINCIPAL       │
│ (ACADEMICS)           │      │   DEPT.      │      │ (ADMIN.)             │
└───────────────────────┘      └──────────────┘      └──────────────────────┘
```

| HOD'S | LIBRARY | SENIOR MASTER | | TRANSPORT UNIT | FOOD UNIT | EXAM OFFICE |

| HOS'S |

| WORKSHOP UNIT | TEACHERS |
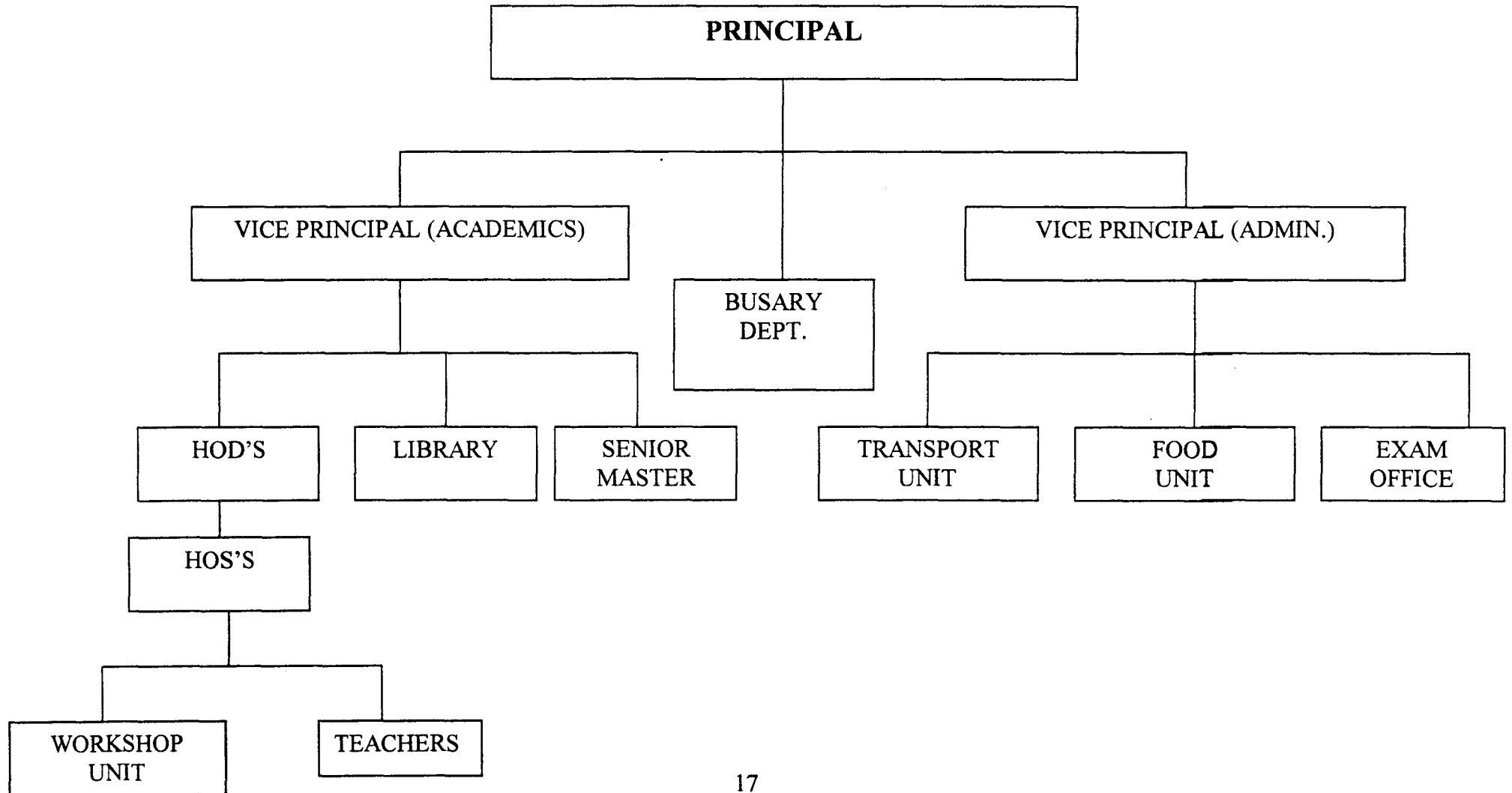
THE PRINCIPAL

The principal is the head of the college. He controls the activities of the college both staff and students. He ensures that enough finance is available for equipment maintenance and the smooth running of the college.

THE VICE-PRINCIPAL (ACADEMICS)

The Vice-principal academics report to the principal and co-ordinates the affairs of teachers, workshop attendants, and students. He prepares duty roasters for the teachers and prefects.

THE VICE PRINCIPAL (ADMINISTRATION)

The Vice-Principal administration also reports to the principal. He co-ordinates the non-academics activities. Registry department, transport unit and examination office. He accepts new staff and students into the college on approval by the principal and also in charge of staff accommodation.

THE BURSARY DEPARTMENT

The bursary department is headed by the bursar who co-ordinates the affairs of the bursary department and answerable to the principal. He prepares the salaries of the workers and keeps careful accounts of expenditure and ensures that payments are not made in respect of unauthorized expenditures. He prepares the appropriation accounts (showing actual expenditure and estimates side by side) of the college. He also accounts for students' school fees.

THE REGISTRY DEPARTMENT.

The Administrative officer is the head of the Registry department. He keeps the records of the staff, departmental files. He keeps proper records of incoming and outgoing files and He reports to the Vice-Principal Administration.

THE EXAMINATION OFFICE

The Examination officer is in charge of examination office and answerable to the Vice principal Administration. He keeps proper accounts of students' records of administration. He arranges for internal and external examination such as NABTEB. He prepares the college examination timetable and ensures the smooth running of the examination.

THE TRANSPORT UNIT

The unit is headed by the Transport officer. He keeps proper records of incoming and outgoing vehicles and vehicle maintenance. He prepares duty roaster for the drivers. He is answerable to the Vice principal Administration.

FOOD UNIT

The food department is headed by the food master. He co-ordinates the activity of the kitchen and ensure that all items required in the kitchen are available. He prepares food for the students and prepares the food budget from tome to time.

SENIOR MASTER

The Senior Master reports to the Vice Principal Academics. He prepares the college timetable and ensures its implementation. He also prepares the college calendar and roaster for the course master and course mistress. He takes the attendants of staff during the Assembly.

THE H.O.D'S DEPARTMENT

There are 5 departments in the college.

(a) HOD BUSINESS DEPARTMENT

He controls two sections: -

(i) Book Keeping.

(ii) Secretariat Studies.

He ensures good conditions of equipment and effectiveness of lectures.

(b) HOD BUILDING AND TECHNICAL DEPT.

He co-ordinates 4 sections for proper teaching and good conditions of equipment. The sections are

(i) Brick, Block and Concreting.

(ii) Carpentry and Joinery.

(iii) Furniture Craft.

(iv) Painting and Decoration.

(c) HOD MECHANICAL DEPARTMENT.

He controls 5 sections for smooth lectures and proper equipment maintenance when necessary. The sections are: -

    (i)   Agric. Mech.

    (ii)   Auto. Mech.

    (iii)   Printing.

    (iv)   Welding and fabrication.

    (v)   Mechanical Craft.

(d) HOD ELECTRICAL/ELECTRONICS

He is in charge of two sections: -

(i)   Electrical Installation.

(ii)   Radio and Television.

He also controls the activities of the sections for proper lecturing and good conditions of the equipment.

(e) HOD HOSPITALITY

He controls the activities of two sections and they are:

(i)   Catering.

(ii)   Garment.

He also ensures smooth learning and good conditions of equipment in the section.

LIBRARY/RESEARCH UNIT.

This unit is headed by the chief librarian who co-ordinates the activities of this unit. The staff and students carryout their research in

this unit .He ensures that there are proper records of the books and research materials in this unit. He also ensures that there is proper records of students who had paid their school fees. He also keeps proper records of equipment that are available in the college. He reports to the Vice Principal Administration.

THE H.O.S'S SECTIONS.

The Head of Sections take care of their various sections. They report to HOD. They ensure proper lecture in their section and maintenance of equipment in their sections.

THE TEACHERS

The teachers report to their various HOS's and they teach the students and assist the HOS for proper maintenance of equipment in their various workshops.

WORKSHOP UNIT.

The workshop attendant keeps proper records of the equipment in the workshop and ensures the proper functioning of the equipment in the workshop. He reports to the Head of section. He teaches the students the functions of various equipment in the workshop and how they are used.

2.3 EVALUATING PROJECT FEASIBILITY

(i) TECHNICAL FEASIBILITY

The principal had just bought some computers and printers and also training the teachers in batches on how to use the computers and the Federal Ministry of Education Promised to send more to the college during the award of certificates of attendance to the first beneficiary of the program. However, more will be required for the offices in the departments and workshop.

(ii) OPERATIONAL FEASIBILITY

The existing system makes use of manual operation and therefore the need of computerizing the system. However, the staff is ready to provide any information required.

(iii) ECONOMIC FEASIBILITY

The authority is ready to provide money available for implementing the proposed solution and this will be recovered by better user satisfaction.

2.3 WHY COMPUTER APPLICATION?

SCIENTIFIC PROCESSING AND BUSINESS PROCESSING APPLICATIONS.

The volume of input/output in scientific data processing is relatively small, and the speed with which these operations are performed is usually not too important. Computational speed on the other hand is a critical consideration since the bulk of the total processing job involves

complex calculation. Storage capacity need only to be sufficient to hold instructions, input data, intermediate and final computational results.

In contrast to scientifically oriented applications, business task generally require faster input and output of data and larger storage capacity. An examination of a typical business application will usually show that the volume of data input and information output is quite large. Computational speed is less critical in business applications because

(i) Arithmetic operations performed on each input record represent a relatively small proportion of the total job and

(ii) The internal arithmetic speed of the slowest computer is frequently much greater than the speed of input/output devices. The following are more specific instances of computer.

COMPUTER IN AGRICULTURE

Computers are used professionally by the people who choose to go into animal husbandry such as raising poultry, dairy cattle – to monitor conditions, diet and environment. New types of diseases resistant plant are being produced through computer-based plant engineering and to monitor weather, water supplies, climate, soil composition etc.

COMPUTER IN INDUSTRY

Many industries are being transformed by the use of computers. Automobile and other product manufacturers use computer-based robots to do work. Engineers and designers are using Computer Aided Design to design items from airplanes to Zippers. In publishing, editing,

typesetting, page makeup, photo treatment creation of illustration and colour work can all be done electronically and much faster than ever before.

COMPUTER IN EDUCATION

Educators have been involved with computers, teaching students a variety of subjects using computer-assisted instruction and using computer-managed instructions. Computer classes are been offered in tertiary institutions, school libraries use computers to aid in library searchers and in management.

COMPUTER IN GOVERNMENT

Governments are by far one of the biggest computer users in the world. It would be impossible to collect, tabulate and categorize the colossal amount of data governments must deal without the aid of computers. Examples of such usages abound in government tax office citizen, registration, and statistical offices.

HEALTH CARE

Many hospitals use the computer to develop colourful graphic CT scans that can show slices through the brain or other parts of the body. In some cases, having this procedure can be as simple as having an X-ray.

Microcomputers can also be used to analyse the nutrition of a meal, develop dietary plans for hospitals and other medical facilities and keep track of exercise programs of all types.

SPORTS

Computers are used to analyze and design new plays, make draft picks and handle the day-to-day business operation of any sports franchise.

They have also been used to analyze the smallest movements an athlete can make. Computers have enabled experts to pin point wasted energy and movements for many athletic events. The result has been world records. In the recent Olympic games, computers were used to help train, feed, schedule, condition, and analyze Olympic competitors started in 1981, the Biomechanics and computer services division of the Olympic. Training center helps co-ordinate traditional training with new high-tech equipment and approaches.

COMPUTERS IN THE HOME

Computers can be used to entertain you , educate you, keep track of your personal budget, plan means, and determine what food items to buy for the next week. With Videotex, you can browse electronically through catalogs of products and services.

Many banks now offer home banking. With home banking, you can make transfers, deposits, and withdrawal with ease.

When it comes to home education, the computer excels. There are computer programs that can teach you virtually any subject you want to know.

2.5 MAINTENANCE BENEFITS

Maintenance refers to keep up, retain, continue and keep in good order of the equipment and tools in the workshop for use.

While a workshop is a room or building in which productive work or manufacture on a small scale.

At Federal Technical College Orozo, the HOD are in charge of their departments while the Head of Sections (HOS) are in charge of the sections assisted by a pool of teachers of technical subjects from its sections and the workshop attendants.

It is from these teams that maintenance of the equipment are being carried out when required.

The team lists all that is required for carrying out the maintenance through the Vice Principal (Administration) to the Principal for approval and upon approval of such request by the principal. The Head of Department (HOD) and HOS arrange for the maintenance of such . equipment.

The college will derive the following benefits from this new system: -

+ It will enhance the efficient operation of the organization in terms of tools, equipment control and management.

27

+ It will create speedy ways of responding to enquiry in order to provide reliable way of formulating policy.

+ It will ensure the avoidance of problems associated with the existing system.

+ It will ensure the creation of speedy ways of gathering report from the system.

+ It will enhance maintenance of data security.

+ It will allow for modification in the design of the system after the new system is fully documented.

2.5 GENERAL BENEFITS OF COMPUTERISATION

Computers were invented in the 1940's for technical reasons to things people could not do within a comparable time span. In the 1950's computers were purchased by some companies to handle payroll preparation and accounts receivable and payable. As the computer matured, people realized that reasons for computerization amongst others was that "better quality of information" improved decision-making... are benefits. That many real life examples of computer projects illustrate that the major benefit of computers is not in clerical cost displacement alone. The benefits that should accrue from computerization are,

SPEED

The most obvious benefit of using a computer is speed. The computer can perform calculation, retrieve data or process data more quickly than alternative methods can. Work that might take humans months, or even

years to compute manually may be accomplished in hours or at most days by the computer. Its ability to perform millions of calculations in one second has obvious implications for management practice. Transaction data can be summarized, compared to historical trends, checked for other relationships are reported quickly. This means that the management control cycle can be shortened.

ACCURACY

The repetitive nature of data-processing activities make them ideally suited to computer processing. Computer care tirelessly performs the same task again with complete accuracy and without complaint. In the same situation, human workers become bored or tired. They find the constant repetitions of the same task tedious and begin to make errors. They begin to record information incorrectly, write illegibly, and transpose letters or numbers. Computers decrease bookkeeping errors. Decreased inaccuracy mean less uncertainty concerning stock, therefore less safety stock is required. Accurate records can reduce the frequency of bad decisions. Decisions that were made because of unreliable or unavailable information.

ECONOMIC OF SCALE

The cost of processing records manually can be calculated at a fixed cost per record. After the number of records surpassed a certain volume the cost per record increases slightly for two reasons,

(i)   At this point, the manual worker begins to make errors, and it becomes unnecessary to maintain a close check on the processing and,

(ii) The sheer volume of data makes the handling and storing of records increasingly difficult.

With a computer the cost per records decreases as the volume of records increases.

EASE OF HANDLING

This factor is directly related to the volume of data. The treatment of information recorded on paper and stored in ordinary files can be a time consuming task. There would even be misfiling, which could result in irrevocable loss of files unless the file is accidentally discovered. The computer can store and search massive files of data and programs. The content of the files does not fade, get torn or get lost and it can be used over and over again.

WIDE APPLICABILITY

A computer can be used to solve a wide variety of problems that arise in science and business. The boundaries of what the computer can accomplish are limited only by the ability and imagination of its users.

CHAPTER THREE

SYSTEM ANALYSIS AND DESIGN

3.0. ANALYSIS AND DESIGN

Analysis of a system is the procedural study of its operation in an attempt to discover what their basic problems are. This will involve an examination of all the facts gathered in order to make a proper assessment of the existing system, while the design is how the new system will be constructed. This is dependent on the information gathered during the analysis stage.

3.1 THE EXISTING SYSTEM.

The existing system uses the traditional filing system for storage of information to understand its workings, picture a typical office with desk, chair and a row of file cabinets along the wall. A wide variety of data on personnel, school pupils, school buildings, vehicles and other facilities are stored in these cabinets.

3.2 FEASIBILITY STUDY

In a system development, feasibility study is an important stage. It involves the process of gathering and interpreting facts in order to acquire a proper understanding of the system and to assist in diagnosing the problems associated with it. The goal of the feasibility study is to identify as quickly as possible whether the benefits of a proposed project outweighs its expected cost and disruption. The outcome of this study is used to determine what must be done to solve the problems that could emanate from the system.

An analysis of the existing system was conducted and this involved an investigation into the present order, with a view to determine how an investigation into the present order, with a view to be developed. The investigation was carried out in collaboration with users of the existing system and staff whose schedule is equipment maintenance.

The following methods of investigating were employed in gathering data:

(i)   Observation.

(ii)   Record search.

(iii)   Interview.

(iv)   Questionnaire.

Parts of the current system studied included; files, method and procedure, existing hardware and software, organizational chart, staff schedule of duty, daily processing activities, problems and shortcomings, etc.

The users of the existing system and staff whose schedule covers equipment maintenance made very useful suggestions and provided helpful insights, which were incorporated into the design of the new system.

3.3   OBSERVATION ON THE EXISTING SYSTEM

During the analysis of the existing system the usual problems associated with information storage using manual filing system were encountered. Some of the problems include: -

STORAGE

Information stored on files makes the files bulky and it occupies much space on cabinet where the file is subjected to tear, misplacement, etc.

RETRIEVAL

Often there is wrong filing or a file might be misplaced.

Ù Because files are spread among many filing cabinets. It takes a long time to locate the required file and update them.

Ù Several offices work on a file, as a result a file may be in circulation with "Action Pending" while a new correspondence arrives from other department requiring retrieval of file.

Ù The speed of retrieval of file is very slow, as a search has to be conducted for a particular file among many, from which the information is to be obtained.

UPDATE

It is always difficult to update as new information tend to stand alone from relating information required to give the full picture. As such information contained in files tend to be disjointed.

REPORT

Time taken to write a report in response to enquiry is too long.

In view of the above stated problems a computerized storage of information on equipment maintenance is hereby proposed to replace the existing manual system.

3.4 THE NEW SYSTEM

The design takes into cognizance the software that would be applicable to the computerization of the existing hardware and best suit the objectives. It gives full consideration to both the required input and output as well as files that contain would be required by the system. It is expected to maintain file on equipment maintenance in the college, provide up-to-date and accurate list of equipment and other reports when required. The new system will also reduce input/output inaccuracies.

The system will also provide for an efficient and effective use of the computer system in such a way that all the necessary equipment maintenance information are carried out without wasting of much time.

3.5 COST AND BENEFIT ANALYSIS

The college has some equipment. However, there is the need to add the following

(i) EQUIPMENT COST

10	PCs at N100,000 each	(N1,000,000)
3	Printers at N70,000 each	(N210, 000)
2	UPS at N50,000 each	(N100,000)
10	Stabilizers N5,000 each	(N50,000)
	Installation cost	(N100,000)

Maintenance cost (Yearly)   (N100,000)

TOTAL   (N1, 560, 000)

Grand total = equipment cost + operating cost

= N1,560,000   + N538,000

= N2,098,000

BENEFITS

(1) Better services.

(2) Faster communication.

(3) Easier retrieval of information.

(4) Timely decision can be taken.

(5) Less administrative cost.

(6) Improved quality decision.

(7) Savings from reduced errors.

The report also reveals that the expected benefit of implementing the new improved system should recover all cost within the first year of operation.

CHAPTER FOUR

SYSTEM DEVELOPMENT/IMPLEMENTATION

4.0. PROGRAM DEVELOPMENT/IMPLEMENTATION

The design of the proposed system was done to suit the analysis undertaken. The design takes into cognizance the software that would be applicable to the computerization of the existing storage procedures, fits the existing hardware and best suit the objectives. It gives full consideration to both the required input and output as well as files that would be required by the system. The system was designed to meet all the requirement of the existing system and other additional facilities such as flexibility, user friendliness, ease of maintenance and efficiency of the system.

The design is expected to maintain files on equipment maintenance in each department at the various workshops; provide up-to-date and accurate list of equipment, and other reports when required, In-addition, the system must have checks and controls that will prevent or at most, reduce input/output inaccuracies.

The system will also provide an efficient and effective use of the computer system in such a way that all the necessary equipment maintenance information gathering are carried out without wasting of much time.

4.1 CHOICE OF LANGUAGE

The proposed system will use Data Base Management System (DBMS). A database is a large group of stored, integrated data elements that can

be retrieved and manipulated with great flexibility to produce information. DBMS is a comprehensive software tool that allows users to create, maintain and manipulate an integrated (cross-referenced) base of business data to produce relevant management information. By integrated it is meant that record are logically related to one another so that all data on a topic can be retrieved by simple request.

4.2 FEATURES OF LANGUAGE CHOSEN

It used to be that programs were developed in a file-processing environment, where users and requirements were treated in isolation from application program that operated almost independently. Files and records were designed in files and records were designed in such a way as to satisfy individual operational needs thus imposing organizational barriers with regards to the data. However, in most information systems, it is desirable to assess data right across the organization. This necessitated the adoption of database environment. In data processing environment, data is viewed as a whole irrespective of their type. Moreover, the integration of data of different types are linked by logical relationships through a DBMS.

The features of DBMS

1. Elimination of Data Redundancy: - More storage becomes available when maintenance of redundant data elements among traditionally separate application files is rendered unnecessary.

2. Easy File Updating: - Because there is only one copy of each data element, all applications have access to the most

current data. In case of updating, data is also changed in only one place.

3.   Data Independence and Simplification of Program Maintenance: - In a DBMS the programs are much more independent of the data than in traditional file processing system. In a DBMS, information about the format and structure of the fields and records is contained in the data dictionary; the programs do not need to contain these detail; when a change in format of one or more data elements was necessary, only the data elements was necessary, only the data dictionary needs to be updated.

4.   Increased User Productivity: - The ability of a DBMS to respond quickly to user request for additional information without involving the user in technical language manipulation encourages faster and more efficient work. The report generators and query languages associated with DBMS make them easy to use.

5.   Increased Security: - Centralized control of access to and use of the database is easily established.

6.   Standardization of Data Definitions: - Before DBMS, each application program could define similar elements of data with different names. However, the use of data dictionaries standardizes the names and description of data elements.

4.3   OUTPUT SPECIFICATION

Output refers to the results and information that are generated by a system. The output from a computer system are required primarily to

Communicate the results of processing to users or other system or more importantly; to provide a permanent (hard) copy of these results for consultation. A computer performs its expected task internally and the result would not be produced until it is told to display them.

The design process of the output begins with the identification of the output the system must produce. This is why in designing of output for the proposed system, the need of the users was fully considered. Basically the output of the proposed system was designed to generate output in the form of hard copy reports. Two reports are to be generated from the system namely

    1. List of serviceable equipment

    2. List of unserviceable equipment

The first report contains the details of the serviceable equipment available in the college. The specification for these reports is

    (i)   Serial number

    (ii)   Department

    (iii)   Section

    (iv)   Name of equipment

    (v)   Description

    (vi)   Model/serial number

    (vii) Quantity

    (viii) Rate

    (ix)   Total value

    (x)   Status

The second report lists all the unserviceable equipment and the specification as listed above.

4.4 INPUT SPECIFICATION

Input refers to the mode of entering data into a system. It is responsible for bringing about the desired output. It is a point of most contact of the system and it is prone to errors. The system input states the source and type of data that needs to be supplied into a system. The input system will strive to

(i)   Produce a cost effective method of input.

(ii)   Achieve the highest level of accuracy possible.

(iii)   Ensure that the input is acceptable to and is understood by the users.

In data entry, coding method in which conditions, words, ideas, or relationships are expressed by code, are developed and used to reduce input task, control errors, and speed of the entire process. Coding ensures that there are fewer details necessary in input without loss of information.

Furthermore, the input is designed to reject non-existing codes and inappropriate data entered. This is further accompanied by a message, which give instructions to the entire users.

The input data into the new system are:-

(i)   Serial/Number.

(ii)   Department.

(iii) Section

(iv) Name of Equipment

(v) Description

(vi) Model/Serial Number

(vii) Quantity

(viii) Rate

(ix) Total Value

(x) Status

4.5 FILE DESIGN

The file design gives the description of all the files used in a system. It includes the description of the content of the files used and their structures. The proposed system is designed to use Database Management System.

The structure states the field names, field width. The proposed computerized equipment maintenance is to use equipment DBF. The structure of the file is as shown below

EQUIPMENT DBF

NAME	TYPE	WIDTH	DECIMAL	INDEX
S/NO	NUMBER	3		
DEPARTMENT	CHARACTER	25		
SECTION	CHARACTER	25		
EQUIPMENT	CHARACTER	45		
MODEL/SNO.	CHARACTER	20		

41

NAME	TYPE	WIDTH	DECIMAL	INDEX
QUANTITY	NUMERIC	10		
RATE	CURRENCY	8		
TOTAL VALUE	CURRENCY	8		
STATUS	CHARACTER	10		

4.6 SYSTEM REQUIREMENTS

System requirement refers to the hardware configuration for the new system. This is the collection of hardware, which forms a complete computer system. The hardware are already in place, so are the personnel required to run the system. The hardware are such that will meet both the current and the future needs of the organization, with respect to the volumes and types of data to be processed. The system would require some supporting software that would enhance the functioning of the system, other software that would provide supporting services, such as text preparation, data analysis, engineering design and other forms of data processing are already available.

The new system is designed to work on a stand alone micro-computer presently the college has the following

(1)   COMPUTER HARDWARE

❖ Celeron computer with the following configuration.

❖ Pentium   333   MHz

❖ 32 MB   RAM

❖ 6.4GB   Hard disk

❖ 1 Compaq computer with

- ❖ Pentium   133   MHz
- ❖ 16MB   RAM
- ❖ 2.1GB   Hard disk
- ❖ 5 PCs
- ❖ 2   Printers
- ❖ 2   Stabilizers
- ❖ 2   U.P.S

The new system is designed to work on a standard microcomputer linked in form of a network. The computer configuration comprises of microcomputers, printers and an un-interrupted power supply (UPS)

The visual foxpro is needed to allow for modification of the suite of programs of the new system. Since they were developed in the environment.

4.7 PHYSICAL DESIGN OF THE PROPOSED SYSTEM

This section deals with the physical construction of the logical design described earlier. It has to do with programs specification for output, input, files and processing into computer software. The designing of the computer software is important to ensure that the actual programs produced perform all the tasks as intended and to allow for future modification to be performed in an efficient manner and with minimum disruption to the design of system. Hence, the documentation of the program specification is specified in the Appendix.

4.8 IMPLEMENTATION

Implementation is the stage that involves turning the design into a working system and then monitoring the operations of the system to ensure that it is working efficiently and effectively.

Implementation is that stage of system development where the conceptual requirement of the new system and the overall objectives are to be transformed into physical reality. This is the most crucial stage in achieving a successful new system that gives users confidence that the new system will work and be effective. It involves creating the final operating documentation and procedures converting files and using the new system

4.9 DOCUMENTATION

Documentation is the process of describing how a system works. This is required to ensure a better understanding of the system by the users documentation serves as a reference text for the end user in case they run into one problem or the other.

In documenting the new system, the mode of starting the new system and the description of the new menu structure is discussed. This is to familiarize the potential user with full operational mode of the system

and the required steps for getting a job done. Hence documentation will be described under two sub-headings.

(i)   Starting the system

(ii)   Description of the menu structure.

4.10   STARTING THE SYSTEM

❖ Boot the system

❖ Click programs

❖ Click Microsoft visual foxpro 6.0

❖ If the welcome to visual foxpro screen appears.

❖ Click open an existing project

❖ Open windows appear.

❖ In the **Look In** combo box.

❖ You select (c drive) hard disk

❖ Select equipment maintainance folder.

❖ Select equipment maintainance project.

At the instance the main menu is displayed on the computer screen and the user will pick a choice

4.11   DESCRIPTION OF THE MENU STRUCTURE

The menu structure will be described using the screen design that will be contained in the Appendix. The new system is composed of departmental management, sectional, workshop unit and quit.

(a)   Departmental Management

Click forms.

Click entering forms.

Forms appear displaying the various departments and sections. These enable the user to carryout various forms of manipulations on departmental details in the form of entering the details of new equipment maintainance, changing information, canceling and displaying information and quitting respectively,

(b)   Sectional Management

This enable the user to carry out various manipulation on sectional level.

(c)   Workshop Unit

This is also done at workshop level, which enables the users to carryout, various manipulations.

(d)   Quit

This enables the user to quit any program.

4.12   SYSTEM CONVERSION

When a manual system is computerized, System conversion needs to be carried out. System conversion involves file conversion, file set up and change over.

FILE CONVERSION: Is the changing of the existing files to the format and content required by the new system.

FILE SET UP: Is the process of setting up the converted files on the computer.

CHANGE OVER: Is the full replacement of all the old procedures by the new ones. Changeover may be achieved in a number of ways

DIRECT CHANGEOVER

This method is the complete replacement of the old system by the new, in one move, it is a bold move, which should be undertaken only when everyone is planned, system tests and training should be comprehensive, and the change over itself planned in detail. This method is potentially the least expensive but most risky.

For security reasons the old system may be held in abeyance, including people and equipment. In event of a major failure of the new system the organization would revert to the old system.

PARALLEL CHANGE OVER

This means processing current data by both the old and new systems to crosscheck the results.

Its main attraction is that the old system is kept alive and operational until the new system has been proved for at least one system cycle, using full live data in the real operational environment of place, people, equipment and time. It allows the result of the new system to

be compared with the old system before acceptance by the user, thereby promoting user confidence.

Its main disadvantage is the extra cost, the difficulty and (sometimes) the impracticability, of the user/staff having to carry out the different clerical operations for two systems (old and new) on the time available for one.

PILOT CHANGE OVER

This is similar in concept to parallel change over. One or more previous periods for the whole or part of the system is run on the new system after results have been obtained from old system and the new results are compared to with the old. It is not as destructive as parallel operations. Since timing is less critical. This method more like extended system test but it may be considered a more practical form of change over for organizational reasons.

STAGED CHANGE OVER

This involves a series of limited size direct change over, the new system being introduced piece-by-piece. A complete part or logical section is committed to the new system while the remaining parts or sections are processed by the old system. Only when the selected part is operating satisfactorily is the remainder transferred.

This method reduces the risk inherent in a direct change over of the whole system and enables the analyst and users to learn from mistakes made as the change over progresses

It creates problems of controlling the selected parts of the old and new system. It also tends to prolong the implementation period. However the last option staged change over will be adopted for this project due to the above-mentioned advantages.

4.13 SYSTEM MAINTAINANCE

It refers to the adjustment that needs to be made to the system after the change over, these adjustment may be needed because, as user gain experience in using the new system, they may discover minor processing errors, or government report regulations may change creating a new requirement for the system to satisfy.

POST IMPLEMENTATION REVIEW

After a new system has been in operation for several months and any necessary system maintenance has been done, a formal evaluation called post implementation evaluation of the new system takes place. This determines either that the new system is meeting its objective or that certain thing needs to be done so that it will. The systems evaluation report is prepared, this summarizes the extent to which the system meets the original objectives and includes a list of enhancement to be considered for future development and implementation.

The objective of the post implementation review would be to

(i)   Determine whether the system goals and objectives have been achieved.

(ii) Determine whether equipment maintainance procedure, operating activities, and other control have been improved.

(iii) Determine whether user services requirements have been met while, simultaneously reducing error and cost

(iv) Determine whether known or unexpected limitations of the system need attention

Any amendment procedure required, with the user of this system would have to be agreed upon with the users. The users are expected to identify any problem areas or external requirement of the system. Based on this, the system will be further designed to meet the requirement of the system.

CHAPTER FIVE

5.0 FINDINGS AND RECOMMENDATIONS

5.1 FINDINGS

The adoption of computer-based system to replace manual procedures has in recent times, become the norm, where the cost benefit analysis result is in the affirmative. This is due largely, to the computers relevance in virtually all aspects of human endeavour.

This interest to computerize is further intensified by the capability of the computers to perform by the capability of procedures with all the required accuracy and efficiency. This is in addition to it is almost non-existent error and its ability to accomplish any task with high speed and within a reasonable time.

From the exposition made in this study, it would be expected that a computer-based procedure such as is being proposed here, needs to be design in a way that will achieve the benefits of computer usage in terms of speed, full automation of procedures, avoid constant problems, ensure data security etc. This is what this study has been able to achieve.

The pursuance of the equipment maintenance of this newly designed system should be absolute as all the procedures have been tested and confirmed efficient. Therefore its application to equipment maintenance management will meet both the present and future needs of the college.

In recognition of the relevance of the computer and its capability, this newly designed Computerised equipment maintenance is hereby proposed for adoption in Federal Technical College, Orozo to achieve the maximization of the benefits stated else where in the this work.

5.2. RECOMMENDATIONS

It is suggested that all offices, workshops and head of sections be provided with computer.

The staff that have benefited, should be sustained and be recommended to the ministry of Education for upgrading.

Furthermore, it is also suggested that a computer program should be offered in the college to enable the students' benefit from the program.

Lastly, it is also suggested that there should be seminars, workshops, conference and in house training for the staff and students.

REFERENCES

ALBERT, B. (1983)   Handbook of painting and Decorating Products.

ANDREW, D. A, CARL, H.T.,

WILLIAM, A. B., KEVIN, B. (1984) Modern Welding

Complete coverage of the welding field in one easy-to-use volume.

BELDLER, J. (1982)   An introduction to Data structures, Allyn and Bacon Incorporated, Boston.

CHAPMAN, W.A.J. (1985)   Workshop Technology Part 1.

CKLEIJNEW, J.P, (1980)   Computers and Profits; Quantifying Financial Benefits of information. Addison – Wisley, Publishing Company Incorporated, Phillipines.

DONALD, S. (1986)   Computers in Business. McGraw Hill Book Company Singapore.

IWENA, O.A. (1998)   Essential Agricultural Science
OLIVER, E.C. and

CHAPMAN, R.J. (1981)   Data Processing and Information Technology D.P. Publications. Ottawa.

RALPH M, S. Jr. (1986)   Computers in Today's World.
VIC, M. (1984)   Farm Workshop and Maintenance.

BADMUS, R.O. (1995)   Software Design and Management.
                             (Unpublished)

BADMUS, R.O. (2002)   System   Analysis   and   Design
                             (Unpublished)

FEDERAL TECHNICAL COLLEGE, OROZO-ABUJA

SERVICEABLE EQUIPMENT REPORT

DEPARTMENT SECTION	EQUIPMENT NAME DESCRIPTION		QUANTITY	RATE	TOTAL VALUE
ELECTRICAL/ELECTRONICS	FILING MACHINE	K352	1	150000.0000	150000.0000
ELECTRICAL INSTALLATION					
ELECTRICAL/ELECTRONICS	POWER CONTROL		1	90000.0000	90000.0000
ELECTRICAL INSTALLATION	DC &AC MOTORS				
ELECTRICAL/ELECTRONICS	TESTING OVERHEAD LINE	3515 967	1	80000.0000	80000.0000
ELECTRICAL INSTALLATION					
ELECTRICAL/ELECTRONICS	DEMONSTRATION MACHINE	DT/01/No.5/1953-1	1	60000.0000	60000.0000
ELECTRICAL INSTALLATION	CONVERTER				

FEDERAL TECHNICAL COLLEGE, OROZO-ABUJA

UNSERVICEABLE EQUIPMENT REPORT

DEPARTMENT SECTION	EQUIPMENT NAME DESCRIPTION	QUANTITY	RATE	TOTAL VALUE
ELECTRICAL/ELECTRONICS	DRILLING MACHINE	1	90000.0000	90000.0000
ELECTRICAL/ELECTRONICS				
ELECTRICAL/ELECTRONICS	SMALL FILING MACHINE	1	90000.0000	90000.0000
ELECTRICAL/ELECTRONICS				
ELECTRICAL/ELECTRONICS	MAGNIFYING LENS	1	1500.0000	1500.0000
RADIO AND TELEVISION				
MECHANICAL	MOULD BOARD PLOUGH	0	0.0000	0.0000
AGRIC.MECH				

FEDERAL TECHNICAL COLLEGE, OROZO-ABUJA

UNSERVICEABLE EQUIPMENT REPORT

DEPARTMENT SECTION	EQUIPMENT NAME DESCRIPTION	QUANTITY	RATE	TOTAL VALUE
MECHANICAL	GRINDING MACHINE	0	0.0000	0.0000
WELDING/FABRICATION				
MECHANICAL	PLATE MAKER	1	70000.0000	70000.0000
PRINTING	ADAST MAXIMA			
BUILDING AND TECHNICAL	BOLSTER	10	1500.0000	15000.0000
BRICK, BLOCK & CONCRETING	CUTTING BLOCKS			
HOSPITALITY	BUTTERLY STRAIGHT SEWING	1	1100.0000	1100.0000
GARMENTS	STRAIGHT SEWING			

III

FEDERAL TECHNICAL COLLEGE, OROZO-ABUJA

UNSERVICEABLE EQUIPMENT REPORT

DEPARTMENT SECTION	EQUIPMENT NAME DESCRIPTION	QUANTITY	RATE	TOTAL VALUE
HOSPITALITY	SINGER	1	900.0000	900.0000
GARMENTS	STRAIGHT SEWING			
HOSPITALITY	POTS	10	600.0000	6000.0000
CATERING	FOR COOKING			
BUSINESS	OLYMPIA TYPEWRITER	1	35000.0000	35000.0000
BOOK KEEPING/SEC. STD	FOR TYPING			
BUSINESS	OLIVETI LINEA 98	1	35000.0000	35000.0000
BOOK KEEPING/SEC. STD	FOR TYPING			

IV

FEDERAL TECHNICAL COLLEGE, OROZO-ABUJA

UNSERVICEABLE EQUIPMENT REPORT

DEPARTMENT SECTION	EQUIPMENT NAME DESCRIPTION	QUANTITY	RATE	TOTAL VALUE
BUSINESS	OLIVETI LINEA 98	1	35000.0000	35000.0000
BOOK KEEPING/SEC. STD	FOR TYPING			
BUILDING AND TECHNICAL	CROSS CUTTING SAW	4	1500.0000	6000.0000
CARPENTARY AND JOINERY	FOR CROSS CUTTING ACROSS THE GRAING OF WOOD			

V

APPENDIX II

PROGRAM CODE

```
*      **********************************************
*      *
*      * 11/04/2002      EQUIPMENT.MPR      03:25:09
*      *
*      **********************************************
*      *
*      * Author's Name
*      *
*      * Copyright (C) 2002 Company Name
*      * Address
*      * City, Zip
*      *
*      * Description:
*      * This PROGRAM was automatically generated BY GENMENU.
*      *
*      **********************************************


*      **********************************************
*      *
*      *              Menu Definition
*      *
*      **********************************************
*
```

SET SYSMENU TO
SET SYSMENU AUTOMATIC

DEFINE PAD _msm_file OF _MSYSMENU PROMPT "\<File" COLOR
SCHEME 3 ;
      NEGOTIATE LEFT, NONE ;
      KEY ALT+F, "" ;
      MESSAGE "Creates, opens, saves, prints files or quits Visual
FoxPro"
DEFINE PAD _msm_edit OF _MSYSMENU PROMPT "\<Edit" COLOR
SCHEME 3 ;

```
        NEGOTIATE  NONE, LEFT ;
        KEY ALT+E, "" ;
        MESSAGE "Edits text or current selection"
DEFINE PAD _0n707btwz OF _MSYSMENU PROMPT "\<Form"
COLOR SCHEME 3 ;
        KEY ALT+F, ""
DEFINE PAD _0n707btx0 OF _MSYSMENU PROMPT "\<Reports"
COLOR SCHEME 3 ;
        KEY ALT+R, ""
DEFINE PAD _0n707btx2 OF _MSYSMENU PROMPT "\<Utilities"
COLOR SCHEME 3 ;
        KEY ALT+U, ""
ON PAD _msm_file OF _MSYSMENU ACTIVATE POPUP _mfile
ON PAD _msm_edit OF _MSYSMENU ACTIVATE POPUP _medit
ON SELECTION PAD _0n707btwz OF _MSYSMENU ;
        DO _0n707btx7 ;
        IN LOCFILE("..\..\EQUIPMENT MAINTENANCE\EQUIPMENT"
,"MPX;MPR|FXP;PRG" ,"WHERE is EQUIPMENT?")
ON PAD _0n707btx0 OF _MSYSMENU ACTIVATE POPUP reports
ON PAD _0n707btx2 OF _MSYSMENU ACTIVATE POPUP utilities


DEFINE POPUP _mfile MARGIN RELATIVE SHADOW COLOR
SCHEME 4
DEFINE BAR _mfi_new OF _mfile PROMPT "\<New..." ;
        KEY CTRL+N, "Ctrl+N" ;
        MESSAGE "Creates a new file"
DEFINE BAR _mfi_open OF _mfile PROMPT "\<Open..." ;
        KEY CTRL+O, "Ctrl+O" ;
        MESSAGE "Opens an existing file"
DEFINE BAR _mfi_close OF _mfile PROMPT "\<Close" ;
        MESSAGE "Closes the current file"
DEFINE BAR _mfi_clall OF _mfile PROMPT "Close All" ;
        MESSAGE "Closes all windows"
DEFINE BAR _mfi_sp100 OF _mfile PROMPT "\-"
DEFINE BAR _mfi_save OF _mfile PROMPT "\<Save" ;
        KEY CTRL+S, "Ctrl+S" ;
        MESSAGE "Saves changes to the current file"
DEFINE BAR _mfi_savas OF _mfile PROMPT "Save \<As..." ;
        MESSAGE "Saves changes to the current file with a new name"
```

DEFINE BAR _mfi_saveashtml OF _mfile PROMPT "Save As \<HTML..."
;
        MESSAGE "Saves the current file as HTML"
DEFINE BAR _mfi_revrt OF _mfile PROMPT "\<Revert" ;
        MESSAGE "Reverts the current file to the last saved version"
DEFINE BAR _mfi_sp200 OF _mfile PROMPT "\-"
DEFINE BAR _mfi_import OF _mfile PROMPT "\<Import..." ;
        MESSAGE "Imports a Visual FoxPro file or a file from another
application"
DEFINE BAR _mfi_export OF _mfile PROMPT "\<Export..." ;
        MESSAGE "Exports a Visual FoxPro file to another application's
file"
DEFINE BAR _mfi_sp300 OF _mfile PROMPT "\-"
DEFINE BAR _mfi_pgset OF _mfile PROMPT "Page Set\<up..." ;
        MESSAGE "Changes the page layout and printer settings"
DEFINE BAR _mfi_prevu OF _mfile PROMPT "Print Pre\<view" ;
        MESSAGE "Displays full pages as they will be printed"
DEFINE BAR _mfi_sysprint OF _mfile PROMPT "\<Print..." ;
        KEY CTRL+P, "Ctrl+P" ;
        MESSAGE "Prints a text file, report, label, contents of the Command
window, or contents of the Clipboard"
DEFINE BAR _mfi_send OF _mfile PROMPT "Sen\<d..." ;
        MESSAGE "Displays Mail window for sending e-mail"
DEFINE BAR _mfi_sp400 OF _mfile PROMPT "\-"
DEFINE BAR _mfi_quit OF _mfile PROMPT "E\<xit" ;
        MESSAGE "Quits Visual FoxPro"

DEFINE POPUP _medit MARGIN RELATIVE SHADOW COLOR
SCHEME 4
DEFINE BAR _med_undo OF _medit PROMPT "\<Undo" ;
        KEY CTRL+Z, "Ctrl+Z" ;
        MESSAGE "Undoes the last command or action"
DEFINE BAR _med_redo OF _medit PROMPT "Re\<do" ;
        KEY CTRL+R, "Ctrl+R" ;
        MESSAGE "Repeats the last command or action"
DEFINE BAR _med_sp100 OF _medit PROMPT "\-"
DEFINE BAR _med_cut OF _medit PROMPT "Cu\<t" ;
        KEY CTRL+X, "Ctrl+X" ;
        MESSAGE "Removes the selection and places it onto the Clipboard"
DEFINE BAR _med_copy OF _medit PROMPT "\<Copy" ;

```
KEY CTRL+C, "Ctrl+C" ;
    MESSAGE "Copies the selection onto the Clipboard"
DEFINE BAR _med_paste OF _medit PROMPT "\<Paste" ;
    KEY CTRL+V, "Ctrl+V" ;
    MESSAGE "Pastes the contents of the Clipboard"
DEFINE BAR _med_pstlk OF _medit PROMPT "Paste \<Special..." ;
    MESSAGE "Pastes the Clipboard contents as a linked object,
embedded object, or other object type"
DEFINE BAR _med_clear OF _medit PROMPT "Cle\<ar" ;
    MESSAGE "Removes the selection and does not place it onto the
Clipboard"
DEFINE BAR _med_sp200 OF _medit PROMPT "\-"
DEFINE BAR _med_slcta OF _medit PROMPT "Se\<lect All" ;
    KEY CTRL+A, "Ctrl+A" ;
    MESSAGE "Selects all text or items in the current window"
DEFINE BAR _med_sp300 OF _medit PROMPT "\-"
DEFINE BAR _med_find OF _medit PROMPT "\<Find..." ;
    KEY CTRL+F, "Ctrl+F" ;
    MESSAGE "Searches for specified text"
DEFINE BAR _med_finda OF _medit PROMPT "Find A\<gain" ;
    KEY CTRL+G, "Ctrl+G" ;
    MESSAGE "Repeats the last search"
DEFINE BAR _med_repl OF _medit PROMPT "R\<eplace..." ;
    KEY CTRL+L, "Ctrl+L" ;
    MESSAGE "Replaces specified text with different text"
DEFINE BAR _med_sp400 OF _medit PROMPT "\-"
DEFINE BAR _med_insob OF _medit PROMPT "\<Insert Object..." ;
    MESSAGE "Embeds an object in a General field type"
DEFINE BAR _med_obj OF _medit PROMPT "\<Object..." ;
    MESSAGE "Edits the selected object"
DEFINE BAR _med_link OF _medit PROMPT "Lin\<ks..." ;
    MESSAGE "Opens linked files or changes links"
DEFINE BAR _med_sp500 OF _medit PROMPT "\-"
DEFINE BAR _med_pref OF _medit PROMPT "Prope\<rties..." ;
    MESSAGE "Set editor properties"

DEFINE POPUP reports MARGIN RELATIVE SHADOW COLOR
SCHEME 4
DEFINE BAR 1 OF reports PROMPT "Serviceable"
DEFINE BAR 2 OF reports PROMPT "Unserviceable"
```

```
ON SELECTION BAR 1 OF reports ;
     DO _0n707btyo ;
     IN LOCFILE("..\..\EQUIPMENT MAINTENANCE\EQUIPMENT"
,"MPX;MPR|FXP;PRG" ,"WHERE is EQUIPMENT?")
ON SELECTION BAR 2 OF reports ;
     DO _0n707btyr ;
     IN LOCFILE("..\..\EQUIPMENT MAINTENANCE\EQUIPMENT"
,"MPX;MPR|FXP;PRG" ,"WHERE is EQUIPMENT?")


DEFINE POPUP utilities MARGIN RELATIVE SHADOW COLOR
SCHEME 4
DEFINE BAR 1 OF utilities PROMPT "\<Backup"
DEFINE BAR 2 OF utilities PROMPT "\<Restore"
ON SELECTION BAR 1 OF utilities ;
     DO _0n707btz0 ;
     IN LOCFILE("..\..\EQUIPMENT MAINTENANCE\EQUIPMENT"
,"MPX;MPR|FXP;PRG" ,"WHERE is EQUIPMENT?")
ON SELECTION BAR 2 OF utilities ;
     DO _0n707btz5 ;
     IN LOCFILE("..\..\EQUIPMENT MAINTENANCE\EQUIPMENT"
,"MPX;MPR|FXP;PRG" ,"WHERE is EQUIPMENT?")



*      ***********************************************************
*      *
*      * _0N707BTX7  ON SELECTION PAD
*      *
*      * Procedure Origin:
*      *
*      * From Menu:  EQUIPMENT.MPR,          Record:  46
*      * Called By:  ON SELECTION PAD
*      * Prompt:    Form
*      * Snippet:   1
*      *
*      ***********************************************************
*
PROCEDURE _0n707btx7
DO FORM FRMEQUIPMENT
```

```
*      ********************************************************
*      *
*      * _0N707BTYO  ON SELECTION BAR 1 OF POPUP reports
*      *
*      * Procedure Origin:
*      *
*      * From Menu:  EQUIPMENT.MPR,        Record:   49
*      * Called By:  ON SELECTION BAR 1 OF POPUP reports
*      * Prompt:    Serviceable
*      * Snippet:   2
*      *
*      ********************************************************
*
PROCEDURE _0n707btyo
REPORT FORM RSERVICEABLE REVIEW


*      ********************************************************
*      *
*      * _0N707BTYR  ON SELECTION BAR 2 OF POPUP reports
*      *
*      * Procedure Origin:
*      *
*      * From Menu:  EQUIPMENT.MPR,        Record:   50
*      * Called By:  ON SELECTION BAR 2 OF POPUP reports
*      * Prompt:    Unserviceable
*      * Snippet:   3
*      *
*      ********************************************************
*
PROCEDURE _0n707btyr
REPORT FORM RUNSERVICEABLE PREVIEW


*      ********************************************************
*      *
*      * _0N707BTZ0  ON SELECTION BAR 1 OF POPUP utilities
*      *
*      * Procedure Origin:
*      *
```

```
*     * From Menu:  EQUIPMENT.MPR,        Record:  53
*     * Called By:  ON SELECTION BAR 1 OF POPUP utilities
*     * Prompt:    Backup
*     * Snippet:   4
*     *
*     ***********************************************************
*
PROCEDURE _0n81esb0a
ans = MESSAGEBOX("Are you sure you want to BACKUP your files?", 4
+ 32,"Warning")
IF ans = 6
       MESSAGEBOX("Please insert a formatted Diskette into Floppy
Drive!", 0 + 48, "Warning")
       USE

       !COPY c:\EQUIPMAINTENANCE\T*.* a:
       !COPY c:\EQUIPMENT
MAINTENANCE\EQUIPMAINTENANCE.* a:

       MESSAGEBOX("You have successfully BACKUP Files ....", 0 + 48,
"Congratulations")

ELSE
       MESSAGEBOX("Please, backup your files at the right time!", 0 + 48,
"Warning")
ENDIF




*     ***********************************************************
*     *
*     * _0N81ESB0D  ON SELECTION BAR 2 OF POPUP utilities
*     *
*     * Procedure Origin:
*     *
*     * From Menu:  EQUIPMENT.MPR,        Record:  54
*     * Called By:  ON SELECTION BAR 2 OF POPUP utilities
*     * Prompt:    Restore
*     * Snippet:   5
*     *
```

```
*      ****************************************************
*
PROCEDURE _0n81esb0d
ans = MESSAGEBOX("Are you sure you want to RESTORE files?", 4 +
32,"Warning!")
IF ans = 6
        MESSAGEBOX("Please insert the BACKUP Diskette into Floppy
Drive!", 0 + 48, "Warning!")
        USE
        SET DIRE TO a:
        SET PATH TO a:

        !COPY a:\T*.* c:\EQUIPMENT MAINTENANCE
        !COPY a:\EQUIPMENT.* c:\EQUIPMENT MAINTENANCE

        SET DIRE TO c:\EQUIPMENT MAINTENANCE
        SET PATH TO c:\EQUIPMENT MAINTENANCE

        MESSAGEBOX("You have successfully RESTORED data....", 0 +
48, "Congratulations!")
ELSE
        MESSAGEBOX("You can always RESTORE your files from the
backup diskettes....", 0 + 48, "Take note!")

ENDIF
```