MAINTENANCE OF OFFICE EQUIPMENT IN PUBLIC INSTITUTIONS

A CASE STUDY OF COMPUTER MAINTENANCE IN NATIONAL WAR COLLEGE, NIGERIA

By

ONAZI, OMANCHI SUNDAY

REG. NO. 97/399

To the

Department of Math/Computer Science
Federal University of Technology (FUT)
Minna – Niger State

MARCH, 2000

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Being a project submitted in partial fulfillment of requirements for award of Post Graduate Diploma in Computer Science (PGD), Federal University of Technology (FUT) Minna – Niger State Nigeria

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CERTIFICATION

This is to certify that this project titled "MAINTENANCE OF OFFICE EQUIPMENT IN PUBLIC INSTITUTIONS: A CASE STUDY OF COMPUTER MAINTENANCE IN NATIONAL WAR COLLEGE, NIGERIA has been read and approved as having satisfied the requirements of the Department of Math/Computer Science, School of Science and Science Education, Federal University of Technology (FUT) Minna, in partial fulfillment of the conditions set for the award of Post Graduate Diploma in Computer Science (PGD).

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DEDICATION

This project is dedicated to God Almighty for His kind mercies and blessings. It is also dedicated to my beloved mother, Mrs Onma Ogenyi and my darling wife Mrs Kate Onazi, my son, Kenneth Onazi and to the cherished memory of my late father, Mr SN Ogenyi who died fourteen years ago.

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My sincere gratitude is to Almighty God for his infinite mercy for seeing me through this programme. The continuation and the outcome of this project could not have been possible without the support and assistance of a large number of individuals. Specially, I am highly indebted to my supervisor Dr Y. M. Aiyesimi who supervised, advised and directed me with great care. To my Head of Department, Dr. S. A. Reju, also to the Dean of Studies, Faculty of Science, Prof. K. R. Adeboye, Coordinator and every other staff of the Department of Mathematics/Computer Science, Federal University of Technology, Minna, for their assistance during the course of my studies.

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I must thank MW O Agenyi, Personal Assistant to DMHO, NWC for assisting me in typing this project. Finally, this acknowledgement will not be completed without saying a special ''thank you'' to my dear wife Mrs. Kate Onazi for her understanding, dedication, support and most especially her prayers. Without her by my side and taking care of the home front during my frequent absence from home, it would have been difficult to concentrate on the course. To my beloved son, I also say thanks infinitely.

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ABSTRACT

An organisation's machines and equipment contribute in no small measure to the success or failure of the organisation's activities. It is therefore important that the equipments be kept in proper working conditions at all times to facilitate job delivery, and ensure consistency of job quality and reduction of fatigue among staff.

Improper and inadequate maintenance culture in public institutions are believed to be among the major causes of most machine breakdowns. Also, lack of proper monitoring and implementation of maintenance plans, policies and projects are other reasons for the continued under-development for Nigeria as a whole.

The research was undertaken to address this issues and make proposals for solving them. A computation of maintenance programme for the report of office equipment is used. This programme is divided into three distinct modules. Master file for Maintenance Record of office equipment, Maintenance Operations and Maintenance Reports. This modules are further divided into submenu as the title module, inventory module, allocation module and modules for systems due for maintenance.

CHAPTER 1

INTRODUCTION

1.1 Background of the Study

To a lay man, a computer is a device that receives, processes, and presents data: the two types are analogue and digital. However, to the trained person, a computer is a machine that can accept data in a prescribed form, process the data and supply the result in a specified format as information or as signals to control automatically some further machine or process. Specifically, a computer is a system composed of many interacting parts. It is made up of hardware and software. This being the case, the thousands of metals, chips and components that make up the computer need periodic maintenance. Another factor is that the maintenance of any office equipments is determined either by the rate of usage, conducive environment, etc because all of them have been subjected to laboratory tests. The manufacture of this components is carried out by well trained, certified personnel in order to achieve uniform standards universally, and also to ensure safety of the components as failure of one may result to a crash of the system. This is the crux of the need to perform the mandatory and periodic servicing of the machines.

At the establishment of National War College in 1992, there was no crave for the use of computers and modern office equipment. In 1996, however, the use of modern office equipment was introduced to the College by the then Commandant, Major General Chris Garuba (rtd).

Interestingly, the College was established to provide the highest level of formal military education intended to inculcate a sense of advanced military professionalism and involvement in the decision making process under a democratic culture and structure. The College also has a Centre for Peace Research and Conflict Resolution.

In pursuit of its professional training programme, the College has developed sound and consistent military expertise in the study of public options as to where, when and how the application of force could be utilised for security and peaceful purposes.

In an attempt to achieve its educational objectives and make sound managerial decisions and recommendations in this new millennium, the use of computers in the day-to-day activities was introduced, ranging from database recording of office equipment comprising of data capture, data storage and dissemination of information. The most recent development has been the acquisition of Internet services and installation of Electronic Media Projector at the Sani Abacha Hall. This is a computerised lecture board used for lecturing the Participants.

1.2 STATEMENT OF THE PROBLEM

Nigeria is counted among the under-developed countries in sub-Saharan African in terms of technology. In addition, due to poor economy, the corrupt attitude of the Nigerian government officials and the low interest and poor attitude to technological advancement, there is no adequate technology and computer service centres within the country. These factors contribute to the country's maintenance problems. It is also apparent that the developed countries of Europe and the USA capitalise on the situation, and then exploit the Nigeria government and continue to ensure that we do not get such facilities. All these translate into huge allocations of foreign exchange for purchasing of computers and their maintenance. This is evident in the recent Y2K saga, of which all those involved in the use of computers and related components were compelled to change their computers or face the risk of computer crash and eminent loss of vital information or figures in the area of banking and risk in air lift operations etc. Put together, therefore, countries importing the compliant computers spent thousands of US dollars,

and taking into consideration the exchange rate, this translated into millions of naira.

Poverty is also another major cause of lack of maintenance culture in our society. Poverty is multi-faceted: deprivation characterised by lack of purchasing power, exposure to risk, insufficient access to social and economic services and limited opportunities for income generation. Although Nigeria is regarded as one of the most richly endowed nations of the world, with large agricultural and human resources, a lot of factors have combined to make Nigeria one of the poorest countries of the world. These include corrupt attitude of government officials, poor infrastructural facilities and low level of physical development.

And down to the National War College, the major problems for lack of maintenance culture, is the military attitude of dictatorship, the general belief that 'government property is nobody's property' and the lack of staff training; especially of the civilian staff. Should this situation be allowed to continue as more money and materials are wasted and technological advancement be undermined? What hope do NWC and Nigeria in general have for technology in computer maintenance and other office equipment? Could the College not look inward for solution? These and others are the questions which the project will address.

1.3 OBJECTIVE OF THE PROJECT

The objective of this project is to explore the most feasible ways to manage the logistics resources available to the College and other public institutions in order to enhance its maintenance capability. The study sought to look into computer and other related maintenance establishment within the College, so as to seek areas of cooperation for mutual development. In this respect, the expansion, integration and enhancement of the College Maintenance Department and Computer Unit should be fully looked into.

1.4 SIGNIFICANCE OF THE PROJECT

In this growing world of computerisation but with escalating costs precluding African countries from individually reaping from its benefits, and given the on-going campaign by the Federal Government on cutting down expenditures in public establishments, there is the need for Nigeria to devote greater resources to computer maintenance. This study will, therefore, be useful to policy formulators, implementers and analysts, not only in NWC but also in other sister organisations. It is thus expected to contribute to the body of knowledge on maintenance of office equipment in public establishments.

1.5 SCOPE

This project will review available resources for computer maintenance within selected establishment using computers in the Federal Capital Territory (FCT). The facilities as well as the skilled manpower available to these establishments will be discussed. Thereafter, the research study will examine the critical problems that could affect the take-off of effective computer maintenance in the College. Having examined these problems, proposals for establishing a computer maintenance department will be articulated. Finally, the study will state the advantages and disadvantages of the proposal and give the conclusion and recommendations.

1.6 METHODOLOGY

Gathering of information for this work was done through primary and secondary data which was obtained through interviews and library/archival research respectively.

The researcher consulted with logistic personnel at various levels of government establishments/institutions; Computer Operators, Analysts, Computer Engineers as well as other personnel, were interviewed. Finally, technical booklets, computer materials and other publications were consulted.

1.7 LIMITATIONS

The main limitations in carrying out this project was lack of funds to visit the various establishments that have fully operational maintenance outfits for on-the-spot assessment and confirmation of facilities and personnel. Others include the reluctance of relevant officials in public establishments to fix and grant interviews on maintenance arrangements in their establishments. This is evident in military establishments, like NWC as it is difficult to get relevant informations due to the restrictive and military policy where informations are highly confidential.

CHAPTER 2

LITERATURE REVIEW

This chapter reviews the theoretical framework of office equipment repairs and maintenance as published in books and papers by authors of systems analysis, maintenance engineers and data processing publications. It first of all defines some basic terms used in this project and then reviews some publications on technology, maintenance and repairs of equipment. This Chapter also looked at the advantages and disadvantages of maintenance and repairs of office equipment. It also reviews technological acquisition as a means for national development and finally gives a general review of the theoretical framework of office equipment repair and maintenance.

2.1 DEFINITION OF TERMS

(a) **Maintenance** – is the performance of preventive or remedial activities in order to prevent incipient hardware faults or to correct a hardware fault that has occurred. In other words, the labour of keeping something (as building or equipment) in a state of repair or efficiency, i.e. preserving it from failure or decline, is regarded as maintenance.

(b) **Preventive Maintenance (PM)** – is the periodic inspection of plants assets and equipment to uncover conditions leading to production breakdowns or harmful depreciation. PM also means the upkeep of plant and equipment to avoid such conditions or to adjust or effect repairs while they are still minor.

(c) **Maintenance–Control Signals** – this is a panel of indicator lights and switch on which are displayed a particular sequence of routines and from which repairman can determine changes to execute.

(d) **Maintenance Activities** – are those activities that are necessary to keep the system operating in a way it was designed and built to operate.

(e) **Enhancement Activities** – are those activities that are necessary to keep the system operating under new or changing environmental conditions.

(f) **Monitoring Performance** – computer systems must be monitored to detect any deviations from planned results and performance, so that suitable amendments can be effected and staff subjected to further training if necessary.

(g) **System Maintenance** – this is sometimes refered to as upgrading, in the context of ensuring that a system meets current requirements.

(h) **Public Institution** – an establishment designed to serve the public, sustained by public funds and accountable to the public.

(i) **Computer** – is a machine that accepts data in a prescribed form, processes the data and supplies results in a specified format as information or as signals to control automatically some further machine or process. It could be described as a machine that follows instructions in order to process data, solve a specific problem or accomplish a particular task. Computer is a system composed of many interacting parts. They are made up of hardware and software.

(j) **Hardware** – are the physical components of equipment that can be seen and touched.

(k). **Software** – is the total of all the programmes that can be run on the computer. Software provides the intelligence a computer system needs in order to perform.

(l) **Programme** – is a set of instructions that the computer hardware follows. Programmes tell the hardware how to behave and this gives the computer system its personality.

(m) **Transfer of Technology** – refers to the process by which the productive sector of the economy of a country import from another country, not only the bulk of its productive machinery and equipment, but also, the expert that will organise the systematic transfer of such technologies through overt legitimate means to the recipient country.

(n) **Acquisition of Technology** – This is an advanced form of transfer technology because it entails the total and active absorption of technology into the cultural and social behaviour of the recipient country. It differs from transfer of technology in that it is systematic, aggressive, and its success will be mutually beneficial to the donor and recipient. A typical example is the industrial investment of US in China in which US needs the China cheap labour and market, while China enjoys the rapid acquisition of US technology through the use of its local labour force.

(o) **Adaptation of Technology** – This involves copying technology to suit the local environment, including the whims and caprices of the local populace. This therefore entails a fuse with indigenous technology. The primary advantage of this technology is the quantum leap it engenders in the technological transformation of the society. This is so because it does not entail the re-invention of the wheel or warrants repeating again the countries it took.

Broadly, transfer, acquisition and adaptation of technology connote the same process of passing technology from one hand to another. However, while the Transfer of Technology is passive, Acquisition of Technology is active and the Adaptation of Technology is pro-active.

2.2 TECHNOLOGICAL ACQUISITION AS A MEANS FOR NATIONAL DEVELOPMENT

The acquisition of technology is a veritable tool for rapid economic and national development. A national survey conducted by the Federal Ministry of Science and Technology (FMST) in conjunction with Unite Nations Development Programme (UNDP) in 1994, covering 209 institutions and industrial establishments comprising 31 federal and state universities, 27 federal and state polytechnics, 30 research institutes and technology development centres and 91 industrial establishments, identifies among other things:

> (a). A staggering list of non-functional, ill-maintained essential equipment and machinery items in many institutions;
>
> (b) An extremely limited national capacity for development and production of spare parts and components of existing equipment;
>
> (c). Poor engineering infrastructure and a glaring deficiency in human resources, skill development and training for equipment design fabrication and manufacture locally; and
>
> (d) A near total dependence on foreign inputs, including scare foreign exchange for any meaningful equipment maintenance, rehabilitation, manufacture and technological services in Nigeria. (Sam Momah, 1999, Pp 112-113).

As a nation, the solution to our prevailing economic problem depends on know far we are able to select and practice the right strategies towards

fostering an enduring technological development, based on our political dispensation, ethnical and cultural values, social surroundings and environmental factors, including available resources. No doubt, technology has today become the key to development, and the survival of any nation depends essentially on its capacity to keep pace with it.

With the rapid global development heralding positive changes in the international scenario, African countries should brace up to adapt cohesive measures to promote economic and technological development in the region. From all accounts, Africa is still rated as the poorest of the continents. There is, therefore, the need to identify viable mechanisms to facilitate our industrialization process in order to attain self-sustained development. Several methods are recognized and are being used by both developed and developing countries to acquire technology. This include: indigenous technology, transfer of technology, acquisition of technology, adaptation of technology, to mention just a few.

2.3 THEORETICAL FRAMEWORK OF OFFICE EQUIPMENT REPAIR AND MAINTENANCE

In the early days of the transistor radio, most African school authorities used to lend and maintain radio sets in schools. Nowadays, this is uncommon because of the greatly increased numbers of new sets used. Manufacturers of typewriters, photocopying machines, televisions, computers and other technical equipment used by schools and public institutions cannot, for economic reasons, provide servicing facilities until there is a sufficient demand. It is a serious waste of expensive resources if they lie idle because they have broken down.

For this reason, many African countries especially Nigeria, have established central repair and maintenance units for school technical equipment – especially science teaching equipment for high schools.

However, the problems of transporting delicate and fragile equipment over long distances and along rough roads have made centres that operate only in this way of limited value.

A more practical solution to this problem in the early times was the establishment of mobile units which systematically toured schools, carrying out routine maintenance as they went, and repairing what they could on the spot in the small workshop built into the vehicle. More difficult repair jobs were taken back to the main centre, leaving a substitute piece of equipment with the school in the meantime, if possible. Such a system presented difficulties but it also proved very useful to schools.

An alternative approach has been to give training to teachers and staff in maintenance and repairs so that they can carry out routine maintenance and minor repairs for themselves. As Higgins and Morrow puts it in their book titled ***Maintenance Engineering:***

> "Training is done to change or increase an individual's knowledge or skills, or to correct a fault or a deficiency".

The payoff for training can be enormous. It has the added advantage that more staff or teachers are made familiar with how to operate the equipment properly, thus avoiding a common cause of breakdown. Training is done for maximum and material use of recourses. Interestingly, some schools and public institutions now offer short in-service training courses in the operation, maintenance and repair of specific items of technical equipment commonly used in schools. Such courses are paying off in reducing the quantity of expensive equipment lying idle in schools and institutions because teachers and staff do not know how to operate it or because it is broken down. It has also encouraged greater use of educational technology by teachers and staff who now have the knowledge and confidence to use it fully.

Obviously, certain types of maintenance will be determined by day-to-day operations. And other serious types of maintenance will be dictated by temporary system failures eg the complete crashing or non response of computers' CPU. As Joseph Allen and Bennet Lientz in his book, ***System in Action***, outlined that there are basically two types of maintenance:

(i) ***Preventive Maintenance (PM),*** housekeeping activities (such as a daily routine scanning to correct or detect faults on PC).

(ii) ***Repair Maintenance,*** which includes replacement of nonfunctioning components and periodic updating of existing system (eg addition to computerized facilities of new data bases as they became available)".

Preventive Maintenance deals with changes designed to keep a functioning system working smoothly; while repair maintenance deals with changes designed to reinstate a system which has temporarily failed.

2.4 ADVANTAGES AND DISADVANTAGES OF MAINTENANCE OF OFFICE EQUIPMENT

Advantages

There are numerous advantages to be derived from the maintenance of office equipment. Some of these are as follows:

a). Staff are made to be familiar with the operation and the use of equipment properly, thus avoiding a common cause of breakdown.

b). There is drastic reduction in the quantity of expensive equipment laying idle in public institutions due to increased maintenance awareness of staff through training, seminars and workshops.

c). Saving of financial, material and human resources through the maintenance of office equipment, since maintenance staff will be on hand to maintain and repair broken-down machines.

d). Training on maintenance will encourage staff and participants through greater use of education and office technology to acquire the knowledge and confidence to use the equipment fully.

e). The life-span of equipment will be longer.

f). Dumping and supply of sub-standard and out-dated computers and office equipment will be reduced or eliminated, since maintenance staff will be on-hand to check every in-coming equipment.

g). There will be gains in terms of transfer of technology in this era of competitive and ever changing technology

h) The establishment of equipment maintenance units in public institutions will eliminate the need to send components to vendors. This will also reduce, drastically, the risk of items getting lost in transit . It will also save time and costs.

i) By harmonising equipment, duplications would be avoided and, subsequently, save costs. In addition, technicians would be spurred to achieve greater heights in maintenance and fabrication of parts because such equipment would be available locally.

Disadvantages

The associated disadvantages of maintenance of office equipment are minimal. However, they as are follows:

a). High cost of recruiting maintenance engineers.

b). High cost of equipment maintenance.

c). Vulnerability of system hardware.

CHAPTER 3

ORGANISATION AND ADMINISTRATION OF COMPUTER MAINTENANCE

Organising, managing and developing an effective maintenance engineering operation of any office equipment involves considerably more than a structural arrangement of positions with different levels of authorities and with different responsibilities.

The factors required for the consideration of an effective operation of computers and or office equipment are: the human attitude to maintenance, training aspect of maintenance, cost effectiveness, effective supervision, effective system control, preventive maintenance and care.

This chapter will discuss, among other factors mentioned earlier, the management and administration of computer maintenance, problems that could occur due to different conditions. Besides dust and smoke, other problems associated with computer are temperature charges, magnetic fields, moisture etc.

In the context of ensuring that a system meets current requirements (system maintenance), the system must be upgraded. Upgrading of a system entails keeping current with technology. Upgrading a computer also means increasing its performance level. Usually, this is done by adding hardware, replacing existing hardware with more advanced components or both, e.g. adding larger hard drive to increase personal computer (PC) storage capacity. Upgrading also involves using a compatible set of components, expanding PC's hardware with specific applications, and understanding how these components work. In other words, increasing the efficiency of the main

applications instead of simply adding loads, memory and speed, is the main reason for upgrading a PC.

The factor responsible for the lack of maintenance culture of office equipment, will now be discussed.

3.1 FACTORS IN COMPUTER MAINTENANCE

The factors to be considered in the maintenance of office equipment are:

a. ***Human factors in maintenance.*** - Human factors which affect maintenance and the people who work at it are not unlike human factors in other fields of endeavour. They consist largely of the needs of individuals and the interplay of the behaviour of these individuals as they strive singly and in groups to achieve satisfaction of their needs. Major emphases on this section are individual groups, motivations, and behaviour, to the degree that the individuals who make up the maintenance force are different from people who work elsewhere – or as their work is different – so their behaviour will differ. It follows that because maintenance is a calling with unique working conditions and unique work goals, behaviour of the maintenance force, and the behaviour of those who interact with it, is especially sensitive.

Maintenance work is unique when compared with routine production work. Much of it occurs at random and in unexpected places and amounts rather than in a planned, predetermined, and carefully scheduled fashion. A production worker on an assembly line knows exactly where he will work each day, and how much he will be expected to produce. Thus, production work is product-oriented; the man or woman on the assembly line can see immediate evidence of the fruits of his labour, while their work is in the mainstream of the enterprise. The work of a maintenance employee, on the other hand, tends to be obscured. His work is performed, not on the product, but in

support of, or service to, those who do it, thus, the maintenance employee is engaged in a form of service work.

Having acknowledged that maintenance work and maintenance workers are different, the biggest mistake a manager could make would be to assume that all maintenance workers are alike. No universal truth persists more pervasively in working situations than the fact that each person is different from another. A person is shorter, taller, thinner, fatter than the other. One workman is cooperative, the other resists every overture for teamwork. There is a universal hierarchy of personal needs that drives each individual forward. This hierarchy, or scale of values and priorities, can be used to anticipate and to understand each person's behaviour. Dr. Maslow outlines the basic needs this way: that we need to be alive to stay alive, we want to feel safe, we want to be social, we need to feel worthy and respected and that we need to do work that we like, this is why people who don't like their jobs turn to hobbies for expression. This needs rarely is the 'be-all' and 'end-all' of our lives, but there are very few of us who aren't influenced by it.

b. ***Training as factor in maintenance of office equipment*** - Training is the process of being prepared for a sport or job. Training is done to change or increase individual's knowledge or skills, or to correct faults or a deficiency. Training can be done which is not needed immediately but is nonetheless done now to correct a perceived need in the future. The payoff for training can be immediate or in the future. Whether we are training for technological, managerial, or inter-personal skills, we are training to make for maximum use of human and material resources in our organisation.

The importance of training is enamours, as we see it as rapidly increasing the number of technological and social changes in our environment. However, not much has been achieved in the training aspect of technological advancement in most public institutions, as it

applies to maintenance functions in various areas including the increasing use of automated equipment, electric control systems, maintenance of information systems. etc. To keep up with training needs, an individual could be attending training programmes regularly or such programmes could be organised by an establishment. The method of selecting applicants for maintenance training courses should be based on the educational back-ground, general intelligence, mechanical aptitude and past experience of such applicants.

c. ***Cost as a factor of Maintenance*** - The cost of maintaining any equipment is the sum total of payments made to the factors of maintenance engaged on the maintenance of that equipment. Information on maintenance-cost can have considerable value if the system for classification, accumulation, the reporting of all maintenance labour and material cost is well designed. In many operations, the accounting system relates maintenance cost to various products manufactured, primarily to establish total production cost. This is a requirement for production and sales management, but from the maintenance point of view, information on the total cost of all work and services provided by the maintenance organisation or total cost by manufacturing areas can allow for comparison of costs only for several periods.

What is needed is a maintenance engineering group, and a cost-accounting system designed to provide specific information on where and for what kind of work maintenance money will be spent. To develop such a cost-accounting system, it is necessary to relate the cost of specific types of maintenance work to production costs or supporting facilities' costs, such as electrical or power-distribution, air conditioning unit etc. Such an accounting system can provide sufficient information to determine which pieces of equipment require unduly high maintenance costs.

It is important to classify maintenance work into various categories. This is because total maintenance cost per product will tell management how much money was spent. It is also necessary to know how much was spent on specific, individual kind of work and alteration as well as service to manufacturing technicians etc.

d. ***Preventive Maintenance and Care.*** - Preventive Maintenance (PM) is a periodic inspection of plant and equipment to prevent breakdowns before they occur. It also involves repetitive servicing, upkeep and overhaul.

To ensure that systems operate flawlessly for as long as possible, one must take care of them. This involves avoiding some harmful actions and performing simple maintenance measures regularly. This measures help minimize wear and tear on the PC and prevent major defects caused by dirt building on various components.

A problem commonly encountered by most operators is that after certain amount of time and use, some diskettes that previously worked flawlessly can no longer be read correctly. The symptoms of this problem seem to indicate mechanical problems. However, this problem is caused by direct build up, on the drive's read/write heads. This problem occurs more frequently with computers that are exposed to tobacco smoke, or the interior of a PC that was in use for several hours may be completely covered with dust. The fan unit in the power supply usually pulls warm air out of the PC interior. As a result, fresh air enters the PC housing through the openings, carrying with it dust and other particles, particularly nicotine. Humidity can cause the coating of dust on the inside of the PC to form a type of insulating layer. This leads to heat buildup in the PC's components. Excessive operating temperatures can shorten the life span of semi-conductor components, or even destroy them. The ideal temperature range for operating personal computers is between 65°F and 75°F .

The basic activities of PM are:

a) periodic inspection of computers and components to uncover conditions leading to system breakdowns or equipment depreciation;

b) Upkeep of the system to avoid such conditions or to adjust or repair them while they are still minor. This basic concept is the main cure from where the project derive its source and will be among the basic stand-points in the project recommendations.

Tips on simple maintenance and care measures for PC

Personal Computers (PC) have almost completely maintenance-free devices. However there are few simple maintenance and care measures that operators can easily perform. This is by simply making a habit of thoroughly cleaning PCs system twice a year. Others are:

(i) *Cleaning the computer interior:-* The best way to clean PC interior is with a fine brush, similar to the type used to clean paintings. Clean the motherboard thoroughly with this brush. For hard-to-reach places, use a can of compressed air with long nozzle tube. Such products can mostly be found in electronics stores. It is used mostly to remove dust anywhere in the system. Moisture cloths are harmful when used on PC components. It is advisable only to use dry methods of removing dust from PC. The interior of the system's power supply unit should also be cleaned. The holes in the unit's casing usually collect a large amount of dust and moisture. If these holes become clogged, the PC ventilation system won't work properly, which can lead to heat building up and, ultimately, hardware damage. The fan blades and screen can also be cleaned using either a brush, compressed air, or a cotton swab.

(ii) *Floppy drive maintenance:-* Like all PC components that rely on moving mechanical parts, disk drives are susceptible to wear and tear. Regular maintenance can increase their life span considerably. This is

done by removing the drive from the system and using compressed air to thoroughly blow all dust deposits from their interior. Before re-installing the drives, use a cotton swab dampened with rubbing alcohol to gently clean the read/write heads.

Care must be taken not to bend any components, and the drive housing should not be opened under any circumstances. Diskettes should always be kept in their dust sleeves, and ensure to keep the area around the drives clean so the heads do not become dirty too quickly.

(iii) *Hard drives are maintenance-free:* Hard drives are absolutely maintenance-free PC components. They are hermetically sealed so that contaminants like dust or nicotine cannot enter them. Hard drive surface damage can be minimized by preventing sudden movements or PC shocks.

Ensure that hard drive heads are properly parked before moving PCs. Also a special programme can be useful for this. Such programme are frequently called PARK.COM or shipdisk.exe. The programme moves the drives read/write heads to a position where they cannot contact.

(iv) *Keyboard, mouse/monitor maintenance:-* A frequently-used keyboard is obviously subjected to a high level of mechanical stress. However, all kinds of debris also fall into the interior of the keyboard. In order to prevent sticking keys and other keyboard malfunctions, this debris must be removed regularly.

The most thorough way of cleaning keyboard is by opening the keyboard housing, using a brush and thoroughly cleaning the keyboard interior.

Mouse cleaning:- The mouse can be cleaned regularly by using a damp cloth. The small roller which contacts the roller-ball can be cleaned with cotton swabs and rubbing alcohol.

Monitor cleaning:- Before cleaning the monitor, ensure that it is switched off. Simple household glass cleaner can be used to clean both the screen and the monitor housing. The cleaner spray must not be sprayed directly on the surface of the monitor but onto a cloth before it is used on the monitor. Never open the interior of the PC if you are not an engineer. This is because the monitor interior houses a high-voltage power supply that stores enough energy to cause serious injury or even death.

(v) *Software maintenance*:- In addition to PC and its components (hardware), software also needs regular maintenance. Make programme and file maintenance a routine task. Occasionally check hard-drive contents and determine which files are still needed and which can be deleted.

(vi) *Computer viruses*:- Due to the increasing numbers of PC users sharing data and using world-wide networks and electronic mail systems, computer viruses have become a serious problem for almost all PC users. Most viruses do not become active immediately after infecting a programme. Instead, they remain dormant for certain period.

When virus attaches itself to a program file, any latest anti-virus programs may be used to remove it. The effectiveness of a "virus killer" depends on how up-to-date it is on the new virus. Although there are no fail-save methods of virus protection, but a computer's chance of contracting a virus may be reduced by following some guidelines which will minimize contact of virus.

- original software should only be used.
- never use PC to make copies of diskettes
- avoid downloading software through your modem.

3.2 APPROACHES TO COMPUTER MAINTENANCE IN PUBLIC INSTITUTIONS

The maintenance of computer systems in most public institutions in Nigeria is not encouraging. A close look at some establishments reveals that there are no computer maintenance units or departments to take care of repairs. Even where such units exist, components or spare parts and facilities are inadequate or lacking. The management instead engages the services of outside maintenance contractor, whereby prices are highly inflated and work are poorly done.

Management of most public institutions pay little or no attention in terms of funding computer maintenance. Monies are not realised on time or monies are not made available to purchase necessary software maintenance and components for use where there is fault. Due to inadequate finances, most existing unit/department are folding up or have folded up and others are not properly functioning.

Also, the approaches of management to computer maintenance in public institutions can be viewed from their attitude of waste, outright mismanagement and misapplication or embezzlement of funds allocated to such unit/department.

It is therefore important that adequate and timely funds be made available to the maintenance of computer and where maintenance unit/department is not in existence, one should be established, and qualified well experience persons be employed and funds be made available for quick dispensation of activities.

CHAPTER 4

SYSTEM IMPLEMENTATION AND COMPUTER MAINTENANCE IN NWC

This Chapter exposes the design methodology of the system. The system is design by constructing Visual Basic codes in Microsoft Access environment.

4.1 MAINTENANCE MENU

The main system maintenance menu is divided into seven (7) sub menus which includes:

1. Welcome Message
2. Title Module
3. More Title Information Module
4. Inventory Module
5. Allocation Module
6. Due for Maintenance Module
7. Farewell Module

The ***Welcome Message Module*** - This menu welcomes the user to the software of the case study. From this environment, the user can either quit using the program or go onto the rest modules of the software without coming back to the main menu.

The ***Title Module*** - discloses the title of the project from this menu, the user can come back to the main menu or go on into other modules of the software.

The ***More Title Information Module*** - Here, the user can read about the reasons for the design of the software. He can come back straight to the main menu or go on into other modules of the program.

The ***Inventory Module*** - By clicking this module, the user will go through the entire computers of the NWC. The type of computers, serial numbers and other information available on them. If there are fresh procurements of computers, modifications can also be done here. From this menu the user can come back to the main menu, and can go further into the software from there.

The ***Allocation Module*** – A click on this modules explains how the computers are distributed within the NWC. The various departments and the conditions of the computers. Also, if fresh allocations are made to any departments, modifications can also be made here. The user can also move around the entire software from here.

The ***Due for Maintenance Module*** - This module exposes the different departments whose components need to be maintenance. From this environment, the user can come back to the main menu, and can also move around the software.

The ***Farewell Module*** - This menu shows appreciation for being used or gone through. From this menu, the user can come back to the main menu, can go round the program, and can as well quit the entire program.

4.2 COMPUTER MAINTENANCE IN NWC

National War College has over 30 PCs and about 20 unserviceable computers. These computers can be seen in all the administrative offices, mounted by Personal Assistants (PAs) or Secretaries. (See diagram 1A/NWC). About 90% of these PAs have no formal training on the use of computers. Most of the training they attended are either 'on the job' training or through their personal efforts and experience as a copy typist. Due to lack of training, they cannot detect faults on their PC.

The bureaucratic nature of the establishment and military system of administration, compounded the problem of maintenance. This is to say that

channel of communication, ie from the point where the fault was detected to the point of final approval for release of fund and through the finance department. This system of administration to implement the policy of a governing authority has hampered development and quick dispensation of policies in most public institutions in Nigeria.

Having analysed the facilities and manpower within the College and its environs as well as the economic, organisational and administrative factors in the maintenance of computer and office equipment, it is necessary to identify some basic factors that influence computer maintenance in NWC, and make proposal(s) for achieving the strategic plan. Significantly, the College has a sound training environment and other facilities which are already in existence, but notably, rather than explore these facilities and train her staff or employ few engineers, the College prefer to seek for assistance outside for maintenance of their computers and other related items. The College management board is doing little or nothing in the area of in-house maintenance of their equipment. If this issue is seriously looked into by the management it will create awareness among the staff and Participants. It will also minimize frequent purchase of equipment, thereby reducing cost of spending and maximize transfer of technology. Furthermore, the segregational procedure as well as facilities for the maintenance department and computer units should be discarded and both units be harmonized, if any meaningful gain is to be achieved. As earlier stated, the proposed NWC computer maintenance unit will have the same ultimate strategic gain of transfer of technology and save costs.

The factors that must be considered in establishing the computer maintenance and care unit will now be addressed.

4.3 HUMAN ATTITUDE TO COMPUTER MAINTENANCE IN NWC:-

The bahaviour of human beings, his training and orientation affect the office in no small way to the use of office equipment. As human faces, background and intellect defer from others, so is our attitude towards maintenance of the equipment he is using in the office. Some staff are dirty, others are neat, some are careful, some are not. There is also the believe that 'government property is no body's property'. To these group of people, they tend to misuse equipment that is not there's believing that the government or establishment can all ways repair or replace them whenever in a bad state of use.

The attitude of most computer users towards PC maintenance is far below standard. An interview conducted recently reveals that, most computer operator attributed this lapses to lack of training, others say they have no facilities for such work, while others say the management will always make repairs by calling maintenance engineers from outside.

4.4 STAFF TRAINING TOWARDS COMPUTER MAINTENANCE IN NWC:-

The importance of training in any aspect of human endeavour can not be over emphasized. Training is done to improve an individuals knowledge or skills, or to correct fault or a deficiency. Staff training in NWC, (mostly the civilian staff) is not encouraging, most especially in the aspect of computer maintenance. The full utilisation of staff training and facilities available in NWC will enormously increase the number of technological and social behaviour of staff and enhance their performance and that of the computers.

The management of the College should embark on aggressive staff training, organise lectures, seminars and workshops on various aspects relating to maintenance of their office equipment.

4.5 ADMINISTRATION AND FINANCIAL ARRANGEMENTS FOR COMPUTER MAINTENANCE IN NWC

Administration is the process by which national educational systems, or institutions within the systems are maintained and controlled according to policies laid down by the governing board. The administration and finance for the maintenance of computers in NWC are cumbersome with bureaucracy and military procedures. Although, there is a computer unit in NWC, but they do not deal on maintenance of computers. Maintenance and repairs are done by outside contractors. As seen in the NWC organogram, computer unit is under the Department of Academic Research and Analytical Support (DARAS)' headed by a director. The computer unit is headed by an OIC Computer, he is to oversee the entire management and functions of computers and is responsible to DARAS.

The computer unit has no separate budget allocation. Staff under these unit includes; 2 Computer Analysts, 4 Secretaries and 21 Computer Operators (PAs) – soldiers who are attached to various units as PAs. Most of these staff, especially the operators have no formal training or knowledge on the use of computer, and cannot perform routine maintenance, like scandisk for virus, disk defragmentation etc. They probably got their training through personal efforts.

The bureaucratic and frustrated channel of financial arrangement in the release of fund for computer maintenance eg If a fault is dictated on any PC, before repairs is carried out, a memo has to be written through the OIC Computer and sent to DARAS, then to the Commandant for final approval before taking to the finance office for release of money or an external maintenance engineer will be invited to repair it. Bureaucracy in NWC is

hierarchical in structure, as seen in the NWC organogram 2A/NWC. This is because the polices implemented are formulated at the top. This framework with necessary rules and regulation to ensure that official policies are faithfully carried out, has given rise to the believe that the word implies a system that is cumbersome.

There is also the issue of inconsistency of inviting maintenance contractors. The College as at now has no fixed retainership agreement with any reputable firm. As faults are reported and approval made for repairs, so are contractors invited at random to repair from different companies. This, not only undermined standard but also systems are left unrepaired which takes time to return back to the College. It also causes high inflation of pricing for inconsistent repairs.

4.6 APPROACHES TO COMPUTER MAINTENANCE IN NWC

As explained earlier, there is no computer maintenance unit or department in NWC, and as such all the repairs are carried out by the invitation of different external maintenance engineers. A retainership agreement with a reputable maintenance, has more advantage than the ad-hoc contract maintenance, where different companies are called upon to repair computers.

Since the operators of the computers have no formal training in the maintenance of PCs, seminars, lectures and in-house training should be conducted regularly to enhance their skills in the use and maintenance of the PCs.

4.7 PROBLEMS ENCOUNTERED ON MAINTENANCE OF OFFICE EQUIPMENT IN THE CASE STUDY

Investigation has revealed that there are problems evident in maintenance of computers in the case study. The problem facing the National War College is the lack of skilled hardware engineers to maintain

the systems. Also, the lack of competent, well trained and experienced computer staff to manage the system, poses a problem.

Another problem facing the institution is the poor and unstable electric power supply characterized by increased power failure. This has culminated in the over-utilization of the facilities available, thereby resulting in the breaking down of most computers, and office equipment.

Also, the poor and long channel of communications between users of computers and the higher authorities to get approval before a reported fault can be repaired. Lack of standard and qualified maintenance contractors to handle the College computers and other equipment is yet another problem. Another problem is the lack of coordination of staff in the offices using computer.

There is also the lack of preventive measures on the use of computers, e.g. some office computers have no UPS to protect the system from power surge. Also, most systems have no anti-virus programmes installed to prevent virus from diskettes into the system. The list are endless.

CHAPTER 5

SYSTEM DOCUMENTATION, MAINTENANCE, CONCLUSION AND RECOMMENDATION

0 DOCUMANTATION

Documentation is the process of collecting, organising, storing and therwise maintaining on paper (or on some relatively permanent medium) a omplete record of why applications were developed for whom, what unctions they performed, and how those functions are carried out. A omputer user documentation dose not necessarily require writing that simplifies software but is thought as a type of writing that translates the computer activities for users. A computer user documentation takes data processing information and translates it into ideas can be readily comprehend by people who are skilled in order disciplines.

In order to ensure adequate documentation for every programming task, the management must establish standard for proper documentation. These standards vary for each computer installation, depending on the types of programs written, the programming language employed, and the computer hardware and software available.

Some of the specific purposes of users documentation are to improves efficiency, to overcome user's fears on equipment or software and to sell the product. Proper user documentation also aids program conversion when hardware/software packages are acquired.

5.1 MEANS OF DOCUMENTATION

At the end of the program design stage, a formal documentation will be prepared to guide future users. Since structure charts, visual charts, Hippo

charts and flowcharts are diagrams, they are excellent and concise form of documentation. They document any programmer's or analyst's work without depending on a programming language. However, the documentation method used in this thesis will be limited to flowcharts.

5.1.1 FLOWCHART CHART

This is a pictorial representation of the program logic. The two most commonly employed formats are the system flowchart and the program flowchart.

5.1.2.1 ***System Flowchart:*** depicts the way data in various forms moves through the stage. A system flowchart represents an over view, not the details, of the solution to the problem.

5.1.2.2 ***Program Flowchart:*** presents the details of steps needed to solve the problem. Program flowcharts are often used to visualize the logic and steps in processing and as such this project will be more concerned with program flowchart. Attached is the program flowchart for this package.

5.2 SYSTEM MAINTENANCE

Once a system is implemented and is in full operation, it is examined to see if it has met the objectives set out in the original specification. From time to time, the requirements of the organisation will change and the system will have to be examined to see if it can cope with the changes. System maintenance can be classified into two; namely:

5.2.1 ***Program/Software Maintenance*** - involves updating programs for necessary changes. Since programs tend to be dynamic, they are subject to periodic revisions or frequent modifications. When changes are made in programs; these should be reflected in the documentation package.

5.2.2 ***Hardware Maintenance*** - In order to protect interruption of computer service, hardware requires regular maintenance. In larger installations, preventives maintenance are carried out each day by a maintenance personnel at a specific time allocated for this purpose. Smaller installations on the other hand carried out maintenance checks once a week or there is an hardware manufacturing. Preventive maintenance involves identifying and replacing components that are likely to fail, and keeping mechanical parts properly adjusted.

5.3 CONCLUSION AND RECOMMENDATIONS

The manual processing of maintenance records had been use. This package is an alternative process which has been found to have great importance to any higher institution. It would increase efficiency and effectiveness of public institutions. This package is design to be user friendly, provides the NWC and similar establishment with an efficient method of storing/accessing inventory, allocation of computers and retrieval information.

The study is about the role of the maintenance of office equipment in public institutions. Its emphasis is on how best National War College, Nigeria and other public institutions can conveniently reduce cost and effectively manage and maintain their office equipment, with emphasis to computers. Beside their traditional role of computer maintenance, other preventive measure like regular cleaning of PC interior, were looked into.

Public office equipment are generally rearguard as no-man's equipment. Hence such equipment are usually poorly maintained leading to high rate of wastage. This trend has been most evident with computers, as most organizations lack the organizational arrangements, human resources and capital assets to keep them in good condition. This study has examined

the maintenance of computers at the National War College. Its major findings are as follows:

(a) The human factors, which affect maintenance of computer; there is the general believe among staff that 'office equipment is no-man's equipment', as a result, such equipment are poorly maintained leading to loss of materials and equipment and high wastage.

(b) Staff training is another factor which affect maintenance of office equipment. It was observed that lack of training of staff resulted in the misuse of these equipment. Most of the staff have no real or formal education, experience and knowledge in the handling of the office equipment. Most of the training they undergo is the kind of 'on the job training' which is usually done half-hazardly.

(c) Thirdly, the administrative and financial arrangements in the handling of office equipment is another factor which seriously affect the maintenance of computer in the College. There is a long, bureaucracy and inconsistent channel of procedure in both acquiring and repairs of equipment in the College system. If for instance a computer is faulty, the channel of communication from the reporting line to the officer concerned to recommend for approval, takes a very long time and delay.

5.2 RECOMMENDATIONS

Based on the above findings and bearing in mind the limitations that affect the completion of this project, the study has put up the following recommendations in order to enhance greater participation of staff and Participants in the maintenance and care of computers and other office equipment.

a). Greater coordination of various units/departments using computer and other related equipment be harmonized with the maintenance department of the NWC.

b). A full fledged computer maintenance unit be established and be given full autonomy and control of all computer related matters and staff management be given to the department/unit of computers to run side-by-side with the maintenance department already in existence for other equipment.

c) Greater staff sensitization towards maintenance of computers and office equipment in terms of training of all cadre of staff, holding and attending lectures, workshops, seminars etc

d) Capable, well trained and experienced maintenance engineers be employed to man the computer units.

e) Adequate budgetary provision should be made to the computer department/unit.

f). All staff should be encouraged to imbibe the spirit of maintenance culture.

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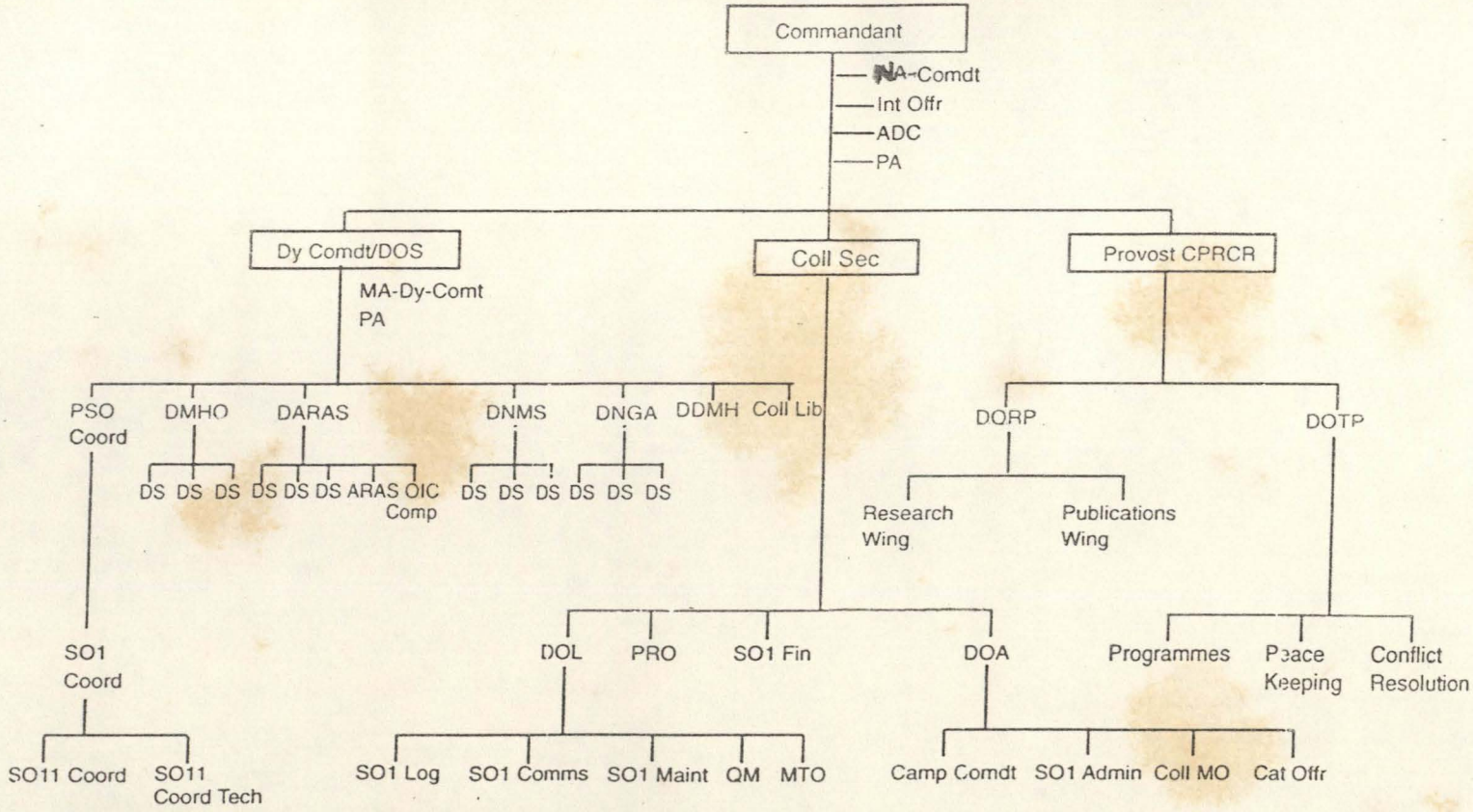
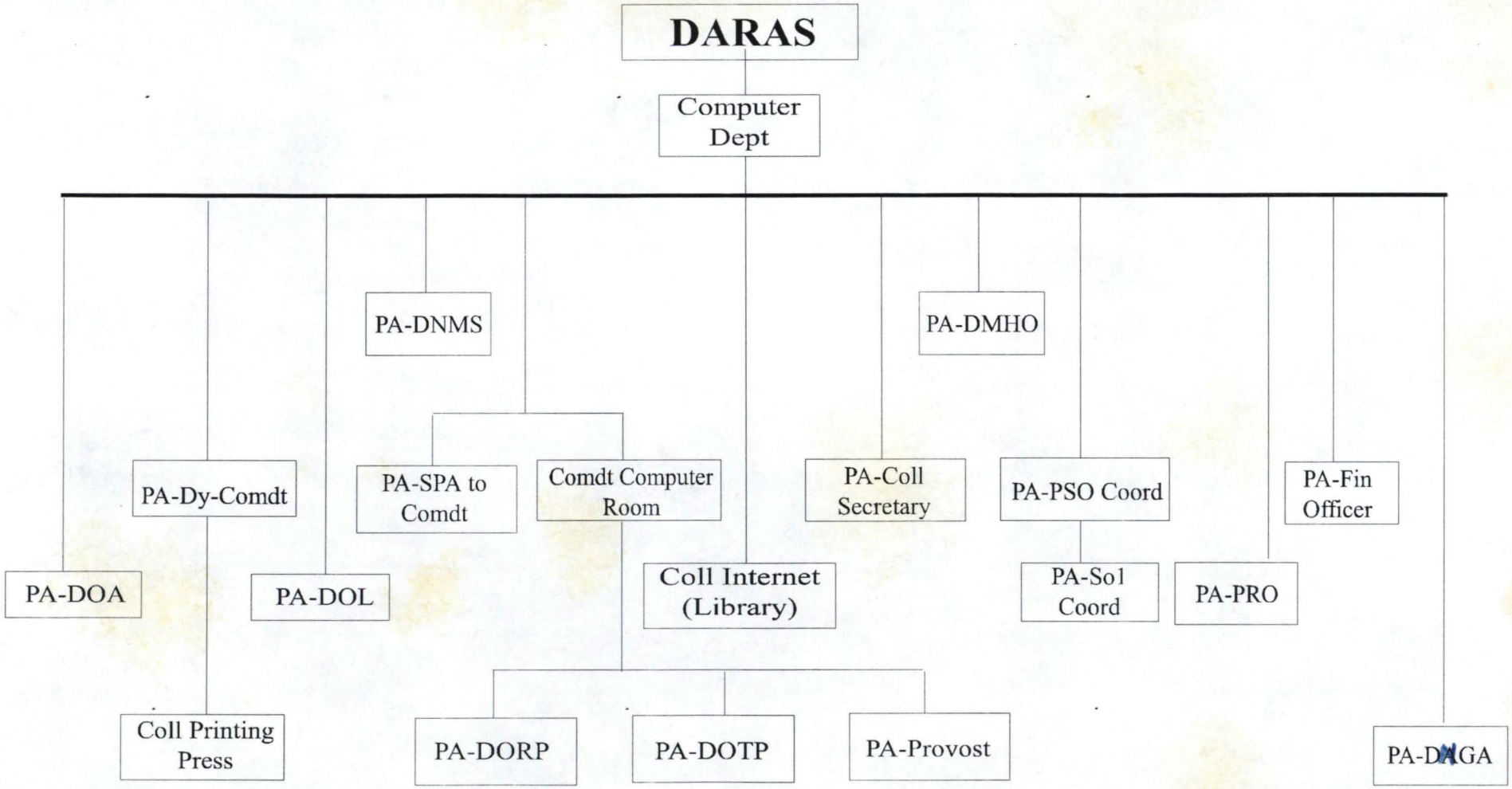
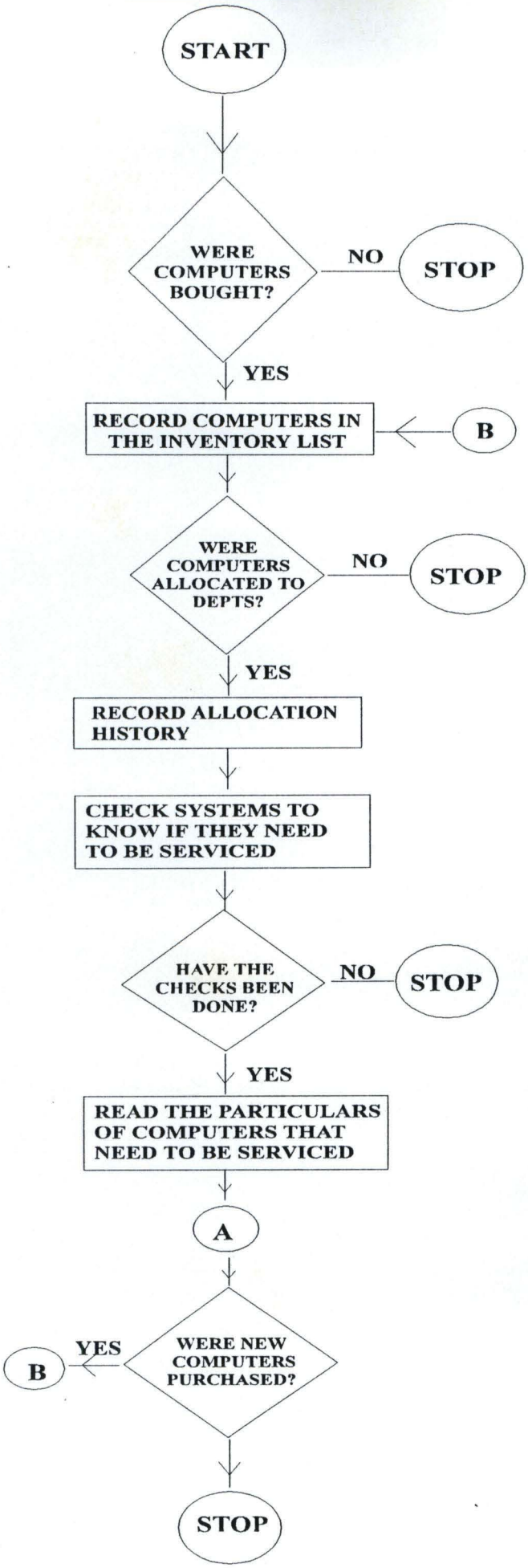
ORGANOGRAM OF NATIONAL WAR COLLEGE



PROPOSED ORGANOGRAM OF NWC COMPUTER DEPARTMENT



FLOWCHART


START
WERE COMPUTERS BOUGHT?
NO
STOP
YES
RECORD COMPUTERS IN THE INVENTORY LIST
B
WERE COMPUTERS ALLOCATED TO DEPTS?
NO
STOP
YES
RECORD ALLOCATION HISTORY
CHECK SYSTEMS TO KNOW IF THEY NEED TO BE SERVICED
HAVE THE CHECKS BEEN DONE?
NO
STOP
YES
READ THE PARTICULARS OF COMPUTERS THAT NEED TO BE SERVICED
A
WERE NEW COMPUTERS PURCHASED?
YES
B
STOP

```
Option Compare Database
Option Explicit

Private Sub Command8_Click()
On Error GoTo Err_Command8_Click

    Dim stDocName As String
    Dim stLinkCriteria As String

    stDocName = "INVENTORY *"
    DoCmd.OpenForm stDocName, , , stLinkCriteria

Exit_Command8_Click:
    Exit Sub

Err_Command8_Click:
    MsgBox Err.Description
    Resume Exit_Command8_Click

End Sub
Private Sub Command9_Click()
On Error GoTo Err_Command9_Click

    Dim stDocName As String
    Dim stLinkCriteria As String

    stDocName = "INVENTORY **"
    DoCmd.OpenForm stDocName, , , stLinkCriteria

Exit_Command9_Click:
    Exit Sub

Err_Command9_Click:
    MsgBox Err.Description
    Resume Exit_Command9_Click

End Sub
Private Sub Command10_Click()
On Error GoTo Err_Command10_Click


    DoCmd.Quit

Exit_Command10_Click:
    Exit Sub

Err_Command10_Click:
    MsgBox Err.Description
    Resume Exit_Command10_Click

End Sub

Private Sub Label1_Click()

End Sub

Private Sub Label6_Click()

End Sub
Private Sub Command12_Click()
```

```
On Error GoTo Err_Command12_Click

    Dim stDocName As String
    Dim stLinkCriteria As String

    stDocName = "EVENT"
    DoCmd.OpenForm stDocName, , , stLinkCriteria

Exit_Command12_Click:
    Exit Sub

Err_Command12_Click:
    MsgBox Err.Description
    Resume Exit_Command12_Click

End Sub
```

```
Option Compare Database
Option Explicit

Private Sub Command8_Click()
On Error GoTo Err_Command8_Click

    Dim stDocName As String
    Dim stLinkCriteria As String

    stDocName = "INVENTORY *"
    DoCmd.OpenForm stDocName, , , stLinkCriteria

Exit_Command8_Click:
    Exit Sub

Err_Command8_Click:
    MsgBox Err.Description
    Resume Exit_Command8_Click

End Sub
Private Sub Command9_Click()
On Error GoTo Err_Command9_Click

    Dim stDocName As String
    Dim stLinkCriteria As String

    stDocName = "INVENTORY **"
    DoCmd.OpenForm stDocName, , , stLinkCriteria

Exit_Command9_Click:
    Exit Sub

Err_Command9_Click:
    MsgBox Err.Description
    Resume Exit_Command9_Click

End Sub
Private Sub Command10_Click()
On Error GoTo Err_Command10_Click

    DoCmd.Quit

Exit_Command10_Click:
    Exit Sub

Err_Command10_Click:
    MsgBox Err.Description
    Resume Exit_Command10_Click

End Sub

Private Sub Detail_Click()

End Sub

Private Sub Label1_Click()

End Sub
```

```
Private Sub Label4_Click()

End Sub

Private Sub Label6_Click()

End Sub
Private Sub Command12_Click()
On Error GoTo Err_Command12_Click

    Dim stDocName As String
    Dim stLinkCriteria As String

    stDocName = "EVENT"
    DoCmd.OpenForm stDocName, , , stLinkCriteria

Exit_Command12_Click:
    Exit Sub

Err_Command12_Click:
    MsgBox Err.Description
    Resume Exit_Command12_Click

End Sub
```

Command 8

```
Option Compare Database
Option Explicit

Private Sub Command2_Click()
On Error GoTo Err_Command2_Click

    Dim stDocName As String
    Dim stLinkCriteria As String

    stDocName = "EVENT 1"
    DoCmd.OpenForm stDocName, , , stLinkCriteria

Exit_Command2_Click:
    Exit Sub

Err_Command2_Click:
    MsgBox Err.Description
    Resume Exit_Command2_Click

End Sub
Private Sub Command3_Click()
On Error GoTo Err_Command3_Click

    Dim stDocName As String
    Dim stLinkCriteria As String

    stDocName = "EVENT 2"
    DoCmd.OpenForm stDocName, , , stLinkCriteria

Exit_Command3_Click:
    Exit Sub

Err_Command3_Click:
    MsgBox Err.Description
    Resume Exit_Command3_Click

End Sub
Private Sub Command4_Click()
On Error GoTo Err_Command4_Click

    Dim stDocName As String
    Dim stLinkCriteria As String

    stDocName = "EVENT 3"
    DoCmd.OpenForm stDocName, , , stLinkCriteria

Exit_Command4_Click:
    Exit Sub

Err_Command4_Click:
    MsgBox Err.Description
    Resume Exit_Command4_Click

End Sub
Private Sub Command5_Click()
On Error GoTo Err_Command5_Click

    Dim stDocName As String
    Dim stLinkCriteria As String
```

```
    stDocName = "INVENTORY *"
    DoCmd.OpenForm stDocName, , , stLinkCriteria

Exit_Command5_Click:
    Exit Sub

Err_Command5_Click:
    MsgBox Err.Description
    Resume Exit_Command5_Click

End Sub
Private Sub Command6_Click()
On Error GoTo Err_Command6_Click

    Dim stDocName As String
    Dim stLinkCriteria As String

    stDocName = "INVENTORY **"
    DoCmd.OpenForm stDocName, , , stLinkCriteria

Exit_Command6_Click:
    Exit Sub

Err_Command6_Click:
    MsgBox Err.Description
    Resume Exit_Command6_Click

End Sub
Private Sub Command7_Click()
On Error GoTo Err_Command7_Click

    Dim stDocName As String
    Dim stLinkCriteria As String

    stDocName = "INVENTORY ***"
    DoCmd.OpenForm stDocName, , , stLinkCriteria

Exit_Command7_Click:
    Exit Sub

Err_Command7_Click:
    MsgBox Err.Description
    Resume Exit_Command7_Click

End Sub
Private Sub Command8_Click()
On Error GoTo Err_Command8_Click

    Dim stDocName As String
    Dim stLinkCriteria As String

    stDocName = "WELL NOW"
    DoCmd.OpenForm stDocName, , , stLinkCriteria

Exit_Command8_Click:
    Exit Sub

Err_Command8_Click:
    MsgBox Err.Description
    Resume Exit_Command8_Click

End Sub
```

OUT PUT

THE INVENTORY OF COMPUTERS IN NWC

ITEM ID: NWC\1001 SERIES **ITEM NAME:** COMPAQ

ITEM DESCRIPTION: #Name? **QUANTITY:** 10

DATE OF PROCUREMENT: 1995

ITEM ID: NWC\1002 SERIES **ITEM NAME:** CLICKER

ITEM DESCRIPTION: #Name? **QUANTITY:** 17

DATE OF PROCUREMENT: 1996

ITEM ID: NWC\1003 SERIES **ITEM NAME:** AIXTEK

ITEM DESCRIPTION: #Name? **QUANTITY:** 10

DATE OF PROCUREMENT: 1998

ITEM ID: NWC\1004 SERIES **ITEM NAME:** SAMSUNG

ITEM DESCRIPTION: #Name? **QUANTITY:** 10

DATE OF PROCUREMENT: 1998

ITEM ID: NWC\1005 SERIES ITEM NAME: SAMTRON

ITEM DESCRIPTION: #Name? QUANTITY: 10

DATE OF PROCUREMENT: 1997

BACK MAIN MENU

IF YOU ARE ITERESTED IN SEEING THE ALLOCATION DETAILS, THEN CLICK " DETAILS"

DETAILS

DETAILS OF ALLOCATION OF MACHINES IN NWC

DEPARTMENT: Coll Internet (Library) QUANTITY: 2

NAME OF ITEM: SAMSUNG

PREVIOUS SERVICE: NONE SERVICE DUE AFTER 6 MONTHS

COMMENT: YES

MAIN MENU

DEPARTMENT: Coll Printing Press QUANTITY: 4

NAME OF ITEM: SAMTRON

PREVIOUS SERVICE: 1999 SERVICE DUE AFTER 8 MONTHS

COMMENT: NO

MAIN MENU

DEPARTMENT: Comdt Computer Room QUANTITY: 3

NAME OF ITEM: CLICKER

PREVIOUS SERVICE: 1998 SERVICE DUE AFTER 6 MONTHS

COMMENT: YES

MAIN MENU

DEPARTMENT: COMPUTER DEPT. QUANTITY: 25

NAME OF ITEM: ALL BRANDS

PREVIOUS SERVICE: 1999 SERVICE DUE VARIABLE

COMMENT: NO

MAIN MENU

DEPARTMENT: DARAS QUANTITY: 1

NAME OF ITEM: COMPAQ

PREVIOUS SERVICE: 1998 SERVICE DUE AFTER 8 MONTHS

COMMENT: YES

MAIN MENU

DEPARTMENT: PA-Coll Secretary QUANTITY: 1

NAME OF ITEM: CLICKER

PREVIOUS SERVICE: 1998 SERVICE DUE AFTER 6 MONTHS

COMMENT: YES

MAIN MENU

DEPARTMENT: PA-DMHO QUANTITY: 1

NAME OF ITEM: COMPAQ

PREVIOUS SERVICE: 1998 SERVICE DUE AFTER 8 MONTHS

COMMENT: YES

MAIN MENU

DEPARTMENT: PA-DNMS QUANTITY: 1

THIS SHOWS THE MACHINES THAT NEED SERVICE AS WELL AS THEIR DEPARTMENTS

DEPARTMENT: DARAS NAME OF ITEM: COMPAQ

MAIN MENU

QUANTITY: 1 COMMENT: YES BAC GO ON

DEPARTMENT: PA-DMHO NAME OF ITEM: COMPAQ

MAIN MENU

QUANTITY: 1 COMMENT: YES BAC GO ON

DEPARTMENT: PA-Dy-Comdt NAME OF ITEM: CLICKER

MAIN MENU

QUANTITY: 1 COMMENT: YES BAC GO ON