THE USES OF COMPUTER IN PROPERTY VALUATION

BY
OMOTOSO ROTIMI DAVID
PGD/MCS/484/97/98

A Project Submitted to the Department of Mathematics And Computer Science in Partial fulfillment of the requirements For the Award of Postgraduate Diploma in Computer Science

The Federal University of Technology
Minna, Niger State.

MARCH 2000

ABSTRACT

The purpose of this write up is to highlight and discuss the uses fund his importance of computer in every aspect of human activities or endeavour and to relate these uses or attributes to the aspect of property management, precisely property valuation. The involves, the analysis of the various attributes and characters then, applying them to the various stages involved in the art and science of property valuation.

The First chapter consists of the introduction , the aim and objectives, the scope of the study. The aim is to examine the impact and uses of computer in property valuation and the various objectives which are three in number. The motivation and justification, the methodology and limitation.

The second chapter consists of the literature review where various textbooks and relevant journals are consulted and cited as back bone for this write-up.

Chapter three contains the theoretical framework, research, design and methodology. This is where the body of the write-up is built and composed. It consist of the various definitions and the cost benefit analysis.

Chapter four takes care of the data presentation and analysis. This consist of life data, a case study and the application of the three main programming languages to the various methods of valuation.

In rounding up the write up, recommendations and conclusions were given. In conclusion this write up is to encourage every Estate Surveyor and Valuers of the need to have a willingness to benefit from the technological advances of our period which I deemed relevant and essential for today's valuer. This goes beyond merely using a

word/work processor, but establishing worthwhile database and developing valuation techniques on spreadsheets, all of which this write-up is out to achieve.

DEDICATION

This project is dedicated unto God, the covenant keeper, unto whom all honour and praise is due. To my parents, brother and sisters.

So also, to all my friends and well wishers. Long life to you all in Jesus name, Amen.

ACKNOWLEDGMENT

CERTIFICATION

I certify that this write-up was done by Mr. Omotoso Rotimi David, Registration number PGD/MCS/484/97/98 of the Department of Math/computer Science, Federal University of Technology, Minna.

---------------------------------   ---------------------------

Dr. Y. Aiyesimi   **Date**
Project Supervisor

---------------------------------   ---------------------------

Dr. S.A. Reju   **Date**
Head of Dept.

---------------------------------   ---------------------------

External Examiner   **Date**

CHAPTER ONE

1.0   <u>INTRODUCTION</u>

Computers are increasingly becoming indispensable. Many tasks at home and in the office that were hitherto executed manually are being automated at a very fast pace. Thus, it is becoming apparent that in whatever discipline of study or nature of employment, the computer is now an important tool for efficiency improvement and precision of job or task execution.

The computer can be defined as a machine which accepts data from an input device, perform arithmetic and logical operations in accordance with a pre-defined program and finally transfers the processed data to an output device either for further processing or in final printed form. It has further capability of storing data.

A computer processes or acts upon datas with the aim of generating an output which is regarded as information. It must however be noted that data are facts collected from observations or measurement about people, events, concepts or objects, while information is a processed form of data, which aids individuals or organisation in decision making.

Computers are used as aids in many human transactions and activities which can be classified into two broad areas namely Scientific/Engineering and Business/Commercial. In the Science field, computers are used to perform complex calculations on small sets of data. In contrast, commercial computing involves simple calculations, but complicated manipulation of large sets of data.

A computer system can be regarded as a set of interacting elements responding to input in order to generate output. It can also be defined as a collection of components

either physical or non-physical in nature, which interact with one another towards a common objective.

Therefore, a computer system consists of a number of components, physical and non-physical, that are interconnected, each one carrying out a specific function towards the common objectives of processing data. These components need to function together in order to enable computers process data into information. The three major components of a computer are; the hardware, the software and the human ware. A computer system cannot exist without the presence of all the above three components.

Computers come in a wide variety of sizes ranging from tiny handheld devices to some that are several feet in height and diameter. Over the years, computers have become smaller and smaller, but they have also become increasingly powerful. Computers can be classified by the way they process data and by their size. They are classified by: (a)   Size, (b)   type of logic they use and   (c)   by purpose.

In terms of size, computer can be divided into four categories namely, supercomputers, mainframe, minicomputers and microcomputers. In terms of logic used, computers are classified into two main types depending on the way they represent and process information they are (i)   Analogue and   (ii) Digital. While in terms of purpose computers are classified into two classes namely, (i)   special   purpose and (ii) general purpose computers.

Computers display the following characteristics to a greater or lesser extent depending on their type and application.

(a)   The ability to perform calculations at very high speeds.

(b)   The ability to take in information and to store that information for future retrieval or use.

(c)   The ability to take in and store a sequence of instructions for the computer to obey. Such a sequence of instruction is called a program and must be written in the language of the computer.

(d)   The ability to obey a sequence of program instructions provided the instructions are stored within the computer. The program instructions will be obeyed in sequence, automatically, without the used of manual intervention at each step. This very different from the operation of a typical pocket calculator which needs buttons to be pressed for each operation, and where the person using the calculator controls the sequence of operations.

(e)   The ability to use simple logical rules to make decisions for their own internal control, or for the control of some external activity e.g. to take over the role of the calculator operator.

(f)   The ability to communicate with other systems.

(g)   The ability to exploit a complete internal structure of micro-electronic circuit in a variety of ways.

On the other hand, the Webster's dictionary, deluxe Encyclopedia edition defined valuation as an estimate of a things worth especially by a professional appraiser or the value cost or price estimated".

Also, valuation can be defined as "the art and science of estimating the value for a specific purpose of a particular interest in property at a particular moment in time, taking into account all the features of the property and also considering all the underlying economic factors of the market, involving the range of alternative investments".

The principal methods of valuation are, the comparative/ comparison method, the contractor's method (or summation or cost replacement), the investment method (or

capitalization), the profits method (or account or treasury method), and the residual method (or hypothetical development method).

The primary basis of valuation for non-specialised properties is open market value or in the case of properties owner-occupied for purpose of the business, open market value for the existing use.

Open market value means the best price at which an interest in the property might reasonably be expected to be sold at the date of the valuation. assuming:

(a)   a willing seller,

(b)   a reasonable period in which to negotiate the sale taking into account the nature of the property and the state of the market.

(c)   That values will remain static during that period;

(d)   That the property will be freely exposed to the open market, and

(e)   That no account will be taken of any additional bid by a purchaser with a special interest. However, open market value for "exciting use sometimes referred to as existing use value" means open market value as defined above but with the additional assumption".

(f)   that the property will continue to be owner occupied for the existing use.

In relations to valuation are land and property development without which the term "valuation" is of no importance and relevant. In view of this. Land according to Raleigh Barlowe, may be thought of as space, as room and surface within which and upon which life takes place. Land as a space includes not only the surface of the earth but also cubic space. Land thus involves the space beneath the surface within which minerals are found and from which they might

be removed, the space that men occupies in his daily living, the space above and about him.

From the legal perspective, land refers not only to the surface area (of the earth) but also to things such as trees, which are attached to the surface by nature to buildings and other improvements attached by man, and to those objects of value which lie either above or below the surface.

On the other hand, development like some other words has many meanings. In relation to land, it may be defined in general terms as, "the using of an area of land for the building of houses or shops etc and so increase its value.

Statutory, the word development is defined as "the carrying out of building, engineering, mining or other operations in, on, over or under land or the making or any materials change in the use of any building or land".

Development can also be defined among other professionals as the process of carrying out construction involving a change in the use of land or with a re-establishment varying from the addition of a bedroom or a garage to a private house or the ambitious re-development of a city centre.

The development of a particular site is a process which involve much more than the more carrying out of a constructional works. Development starts right from the time the idea is conceived and not when the buildings are designed. So also, it lasts even perhaps well beyond the time when works are completed to the time the new accommodation is fully occupied and used.

1.1   AIMS AND OBJECTIVES

The aim of this write-up is to examine the impact and uses of computers in property valuation. Meanwhile, the objectives of this write-up are:

(a) Bringing to light the usefulness of computer in result oriented decision-making.

(b) Examining the various capabilities of computer and how it can be effectively employed in property valuation for precise and accurate opinion of value.

(c) Highlighting and bringing to use the various computer programming languages in estimating the worth of a property.

Based on these objectives, recommendation shall be made.

1.2 SCOPE OF THE STUDY

This study centres on the uses of computer in property valuation. A study like this is broad and much involving but in order to bring it to a manageable and reasonable size, it has been limited to one area of assets, that is property; I mean landed properties. As valuation too is very broad and wide, the study is limited to property valuation. So also, much emphasis shall be on the various programming languages and their applications.

1.1 MOTIVATION AND JUSTIFICATION

Observing the trend and pace of technological advancement, the world is turning and fast becoming a computerised world and hence the use of computer in day to day activities and livelihood.

The need for a more accurate and precise opinion of value within the shortest time possible is desired and can only be possible with the introduction of computers into the valuation process, as this aids in taking a very accurate managerial decisions.

Also, with the need for computer literacy, the inability of a company, business organisation or firm to be involved in the technological movement makes such firm to be technologically retarded and out of tune. With these and coupled with some other benefit derived from technological advancement, makes the study justifiable.

1.2   METHODOLOGY

In order to achieve the stated objectives, the following methods are used in obtaining the necessary information.

(a)   **Primary Source**: This involves personal interviews with the various professional firms and Estate Surveyors who out of their experience can give the best judgement on how the computer has enhanced their performances in property valuation over the years.

(b)   **Secondary Source**: This involves making references to relevant published and unpublished texts, dissertation, journals and handouts.

1.3   LIMITATIONS

The followings are the limitation to the study.

(1)   **Inavailability of adequate and up to date data**: There are little or scanty record of performance or improvements as the people concerned did not see any justification to keep or compare their performances with the introduction or availability of computers.

(2)   **Financial Limitation**: Much fund will be required to achieve a very accurate result.

(3)   **Time**: A lot of time is needed to reach the people and to have a thorough observation.

CHAPTER TWO

LITERATURE REVIEW

Instability in the property market creates many challenges for the professional valuer. As a result of the recent commercial property boom and boost, the natural evolution of valuation process has accelerated and changed in addition, the development and widespread use of micro computers has facilitated the use of detailed spreadsheet analysis in valuation. The direction of this evolutionary process and the implications on the valuation practice in Nigeria are examined in this write-up.

Introduction

The art, science and discipline of property valuation lies at the very heart of the set of skill assembled by the valuer. Arguably, an expertise in this area is the only factor which sets the professional property advise apart from other professionals who are making in roads into the estate surveying and valuation profession. In addition, a grasp of valuation raises the property adviser above the non-professional practice of agency and brokerage. Finally, so much of a nation's wealth lies in its real estate assets that the valuer has a duty to contribute his expertise to efficiency in the use of scarce resources.

It is true to say that valuation has seen a near-revolution in both theory and now in practice over the past 2 decades. The early writing on property valuation theory are often referred to as the classical school and include such writers as Marshall (1925); Babcoek (1932) and Bonbright (1937). Their ideas which have survived for a very long time were based on an ethical and normalising (normative) approach to the market fluctuations.

8

The concept of willing buyer and seller under normal market conditions' was widely accepted in the definition of market value.

Over the past decade or so, it has become increasingly obvious that a new valuation paradigm has been evolving. Elsewhere, particularly in the United Kingdom, the United States of America and Australia, the evolutionary change has occurred in fits and starts, at different rates in different settings, but with a consistent theme and direction.

The open revolt against the old paradigm is evidenced by writing in the United States of America of Ratcliffe (1972), Grissom (1985) Roberts and Roberts (1991), in Australia of Whipple (1990), Boyd (1992) and in the United Kingdom of Greaves (1972), Sykes (1984), Crosby (1985) and Barm and Crosby (1988), Barm and Macgregor (1992). These authors have emphasized the used for new directions in valuation methodology to cope with the evolutionary changes in the property investment market. The consensus of opinion is that conventional valuation routines are no longer acceptable.

The objective of this review is to consider the evolutionary process, its direction, and its implications on valuation practice in Nigeria placed against the prevailing atmosphere by examining the current demands and threats being faced by the Estate Surveyor and valuer. Demands and threats which have become increasingly global as property market across the world approach the degree of concentration and sophistication The review is structured into three main sections. In the first section, the current framework within which investment valuations (conventional paradigm) are carried out in Nigeria is examined. This is followed by an exposition of current global emphasis (contemporary paradigm) on methodology of valuation. In the last section, implications and newly proposed directions for property valuation in Nigeria are examined.

9

The Conventional Paradigm

The conventional paradigm was based on the direct capitalization of 'stabilized' income, a simple study and projection of the market, (if any) and emphasized market value. The fundamental assumption was not inappropriately, stability of the economic environment.

The whole concept was based on the historical assumption of property as an equity such that the return demanded was related directly to long term gifts. A modest premium of 1 or 2 percent was demanded for the extra risk and trouble of property, and no account was taken at all of potential growth in incomes. Indeed, growth was often unattainable because leases were long, property was not required to be physically adaptable, was held as a long term investment and contained no opportunities to review the rent. This was the genesis of the all risks yield approach. Risk was considered only implicitly, if at all. In essence, the all risk yield approach can often make unreasonable demand son the value's judgement in order to distill into a single figure of years purchase (YP), the diversity of characteristics which an individual property might possess (regularity and security of income, prospects of growth, type of tenant, location, management etc).

The Contemporary Paradigm

The form of the evolving paradigm is clear in the main, it is the explicit, consideration of risk in the valuation process or what Baum (1984) referred to as 'exposing the implicit'. Some of its aspects are examined.

(i)   Re-definition of Market Value

Attempts have been made to redefine market value. In the United Kingdom, the definition of open market value, so well known to chartered surveyors and set out in the Red Book of the Royal Institution of Chartered Surveyors have been re-examined. In Australia, the issue of market value definition has also been revisited. Hill (1990), Hunt (1991), and Rothwell (1991) are classic examples. For instance, Whipple (1990) discussed value definitions and approach in detail and highlighted the shortcomings of the normative valuation approach. An excellent description of value and the task of the valuer was also given by Britton, Davies and Johnson (1980, p. 3) when they stated: "Value is not intrinsic but results from estimates made subjectively by able and willing purchasers of the benefit or satisfaction they will derive from ownership of the interest. The valuer must therefore in order to value an interest, be able to assess the probable estimates of benefit of potential purchasers".

In an unstable and rather depressed property market, the valuer is faced with questions such as, what if there are no willing buyers and only unwilling buyers and only unwilling or forced vendors? What is a reasonable period in which to negotiate the sale? Ultimately, a standard but rather flexible definition of open market value is essential to main applicability in a market characterised by instability.

Following a recent meeting of the International Assets Valuation Standards Committee (TIAVSC) in May, 1992, a new definition of market value has been accepted worldwide. In terms of the TIAVSC reporting guidelines, market value is now defined.

11

"Market value is the estimated amount for which an asset should exchange on the date of valuation between a willing buyer and a willing seller in an arms length transaction, after proper marketing, where in the parties had each acted knowledgeably, prudently and without compulsion".

It is further argued that it is unrealistic to express market value in definitive terms. The concept of 'most probable price' is widely gaining acceptance, as it infers that the actual market conditions at the time of valuation are taken into account.

Downs (1992), discussing the unreliability of today's appraisals in the United State of America stated: "the idea that there is a 'true market value' of any real property that can be expressed by a single number is a convenient myth invented by the real estate industry. This fiction is necessary to the industry because many of its members want to be able to state the 'current values' of their properties or property portfolios. In reality, there is no such thing as the 'true market value of any piece of real estate. Even the numbers that appraisers call a property's "market value" is not only a subjective judgmental estimate which they freely admit – but also a single member that really stands for a whole set of possible values, which they do not usually admit. 'True market value' is supposed to be what a willing buyer would pay a willing seller under specified conditions. But future uncertainties are always so great that different buyers would pay a range of different values under different and often unpredictable conditions. The truth of Downs statement should be obvious to valuers who have worked through transaction negotiations to their conclusion. The erstwhile approach of recommending a single discrete numerical value, is inherently flawed

12

because as we have seen, the valuation analysis is clearly an estimation process that can produce a range of values all of which can be reasonable under the circumstances. Valuers are therefore increasingly encouraged to specify a range of values in their recommendations. By so doing, the issue of risk in the valuation process is explicitly accounted for.

(ii) **Spread Sheet Modeling**

Spreadsheet modeling often correctly referred to as DCF analysis is now the most versatile and powerful tool in the valuer's tool kit. The power of spreadsheet modeling as a technique for comprehensive analysis and valuation of property investments is its almost infinite richness in information theoretic terms.

It allows the valuer to clearly specify the quantity, variability and duration of estimated periodic income as well as the quantity and timing of reversions. A 10 or 15 year cash flow for the interest in the property to be valued is projected against explicit assumptions of rental income, expenditure and other variables such as inflation and interest rate. The cash flow is then discounted back to a present value against the required internal rate of return. Modern spreadsheet computer programme (e.g. Lotus 1-2-3) make the interactive calculations involved automatic.

Whereas the all risks yield approach implies an IRR and a level of future performance from a capital value, the DCF method works back from an assumed cashflow and a minimum target level of return, to produce a present capital value. As a result, the valuer is judged as much on the quality of his assumptions as on the accuracy of his capital value

13

answer. It therefore does not diminish the need for a valuer's judgement, and while no less an art than a science in that respect, the basis of computation is perhaps made easier to comprehend by the client.

The proper and appropriate application of spreadsheet modeling and DCF analysis, based on market derived information, should be aggressively fostered, not just timidly accepted, for it is the centre-piece of the evolving valuation paradigm.

C.A. Ajayi in his write-up recommended some changes towards new directions for valuation practice in Nigeria, they are stated thus:

(i) New definition of market value emphasizing market value as price in exchange. A good starting point is a review of the Guidance Notes on Asset valuation.

(ii) Valuation statements should describe the value assessed as 'the most probable value' as opposed to 'the value'. There is no single correct value and the valuer should be the first to acknowledge this fact.

(iii) Specification of accuracy of valuation is essential. Because of the varying degree of accuracy achievable in assessments, the valuer should attempt to qualify the accuracy of his/her valuation. This is not an easy exercise but it is a stimulation of the complications of the market place. As more accurate statistical information on the market is known, measures of risk, such as standard deviation, and range should be determined. Risk analysis will be a prime requirement of the more sophisticated clients.

(iv) Computer modelling must assume priority. A willingness to benefit from the technological advances of our period is essential for today's valuer.

This does not mean merely using a word/work processor, but establishing worthwhile database and developing valuation techniques on spreadsheets.

(v) Professional practice must be upgraded. Valuers must capitalise on their expertise and expand their current role from 'valuers and suppliers of figures without supporting advice' to 'consultants'.

(vi) The NIESV and the Estate Surveyors and Valuers Registration Board of Nigeria must play an active role in all forms of education and research. To do this, they must involve academicians and practitioners. The continuing professional development programme must offer members the opportunity to change with our times.

Caveat Syndrome and the Estate Survey and Valuation Report

Like every other profession in Nigeria, the proliferation of caveat in valuation reports can be described as evolutionary landmark in the professional practice of Estate Surveying and Valuation. It is the thrust of this write-up that so far as Estate Surveying and Valuation in a profession with dual legal responsibility, the use of Caveat or exemption clauses or any other contractual stipulations as protective tools in valuation reports have no disputable validity. There is need for professional efficiency and effectiveness. There is used for inter-disciplinary cooperation in carrying out complex services to ensure higher reputations and impeccable integrity.

The practice of Estate Surveying and Valuation in Nigeria came into prominence since the past 23 years. During the period, Nigeria has experienced tremendous growth and development in education, commerce, industry and governmental activities which involved the employment of Estate surveyors and valuers. The activities have now increased in variety, magnitude, and dimension.

They invariably entail considerable degree of risk, complexity and uncertainties. This led the Estate Surveyors and Valuers to the use of complex contractual stipulations intended to guarantee their safety, convenience, economy and protection within their network interaction. This is done by their inclusion of CAVEAT or exclusion clauses in their Survey and Valuation Reports whereby they disclaim responsibility for or to limit or exclude liabilities in torts and/or contract with relation to their clients. This practice has proliferated in number, variety and complexity and it is here in termed "CAVEAT SYNDROME". It takes a combination of the following forms:

(a) **Assumption or Limitations**

- that the client's is assumed free from encumbrances and charges.

- that the information supplied in valuing the property is correct.

- that the client's title to the property is good and marketable or it is not adversely affected by or subject to compulsory acquisition, road widening etc.

(b) **Opinion of Value**

Is at date of inspection or that the certificate of value is a product of independent judgement and skill with nothing to do whatsoever with professional fees and the discretionary decision of the party replying on it or that neither our employment nor our fee for this valuation assignment has been contingent on our arriving at a specified or implied value or otherwise contingent on anything else other than the delivery of the report etc.

(c)   **Disclaimer of Responsibility**

- that no responsibility will be accepted for any condition not readily as observable from customary inspections of the premises which may affect the valuation excepting those items specifically mentioned in the report or

- that we disclaim responsibility for any volatile physical and/or economic changes reasonably unforeseeable during our valuation inspection survey.

- No structural test was carried out on the building, no discernable signs of structural defects or it is presumed the property is sound structurally.

In conclusion, not much has been done to bring to limelight the relevance and importance of the technological advancement to the profession. So also, the insensitivity of our people to changes in level of operation has accounted for the inadequacy of local literatures and journals.

CHAPTER THREE

3.0 THEORETICAL FRAMEWORK, RESEARCH, DESIGN AND METHODOLOGY

3.1 Property Valuation:

Valuation is defined as 'the art and science of estimating the value for a specific purpose of a particular interest in property at a particular moment in time, taking into account all the features of the property and also considering all the underlying economic factors of the market including the range of the alternative investments".

The principal methods of valuation used are: The comparative method (or comparison), the contractor's method (or summation/cost replacement). The investment method (or capitalization), the profits method (or accounts or treasury method), and the Residual method (or hypothetical development method). The names in brackets are those used in different countries in lieu of the traditional English names for the methods.

However, the theory and practice remain the same whenever the methods are used.

The Webster's Dictionary, Deluxe encyclopedic edition, defines 'valuation" as an estimation of a things worth especially by a professional appraiser or the value cost or price estimated. This is the area in which the Estate surveying and valuation profession has made the greatest impact on the Nigerian economy. There are various purposes of valuation which are as follows:

- Valuation for mortgage purposes

- Valuation for share floatation .

- Valuation for mergers.

- Valuation for take –overs.

- Valuation for refinancing.

- Valuation for compensation

- Valuation for rating.

- Valuation for financial (accounting) purpose.

- Valuation for insurance purposes.

- Valuation for balance sheets

The valuation process involves three main stages namely the instruction, the physical inspection and the report writing which includes the calculation

Valuation Instruction

This would usually come either orally or in written form but the experienced valuer would ask that an oral instruction should be further confirmed in writing not only for the contractual relationship (privity of contract) which it bestows but more importantly because it would spell out quite clearly the purpose of the exercise. Where the client is not quite sure of the type of valuation needed he should consult his valuer who would advise as to the appropriate valuation. The most common purposes for which valuations are needed are book or financial purposes, mortgage, and insurance.

Usually it is at this stage that the valuer asks the client for evidence of ownership (certificate of occupancy). Elsewhere in English speaking Africa there are freeholds and leaseholds but in Ghana just as in Nigeria there is a restriction as

3.2   Methods of Valuation

As earlier mentioned different values may be thrown up in respect of the same property since such values may be for different purposes and consequently on different basis. When valuing a bungalow in Ikoyi for mortgage purposes the open market basis is applied and the method adopted may range from comparable through investment to depreciated replacement cost plus land values the figure arrived at will differ considerably from the value of the same property for insurance purposes as in this case the valuer will adopt the replacement cost of the structures only without provision for depreciation as for the land on which the property stands (since land is considered indestructible for this purpose).

Open Market Value

The primary basis of valuation for non-specialized properties is open market value or in the case of properties owner-occupied for purposes of the business, open market value for the existing use.

Open Market Value means the best price at which an interest in the property might

reasonably be expected to be sold at the date of the valuation assuming:

(a)   A willing Seller.

(b)   A reasonable period in which to negotiate the sale taking into account the nature of the property and the state of the market.

(c)   That values will remain static during that period.

(d)   That the property will be freely exposed to the Open Market, and

(e)   That no account will be taken of any additional bid by a purchaser with a special interest.

22

However, Open Market Value for the existing use sometimes referred to as "Existing use value" means Open Market Values as defined above but with the additional assumption:-

(f)   That the property will continue to be owner occupied for the existing use .

There are several methods by means of which the open market value of an interest in property can be arrived at but the three most commonly used shall be considered:-

Comparables Method

This method considers transactions in comparable properties in the same neighborhood as the subject property. If a four bedroom that on the same street as the subject property is sold for N4 million last week with their site and tenurial details reasonably similar, it is reasonably good to value the subject property to be about million.

The principal demerit is that no two properties are really similar if only fo locational differences. Two points on the same street would have differing ch On Marine Road, Apapa values are much lower towards the Aijegunle and noise of the minibuses that operate from Apapa wharf and have their ld canal end. Of course, the valuer can make provision for certain diffe ere be very subjective. It's principal merit is its simplicity. To be must be information as to recent transactions.

Investment Method

This method estimates the current rental value of estate management in the form of ground (if any) income over the residue of the tenure. The major

r good
s the net
that not all

properties are incomes yielding. How does a valuer estimate the rental income from a town Hall or an hospital when there are no letting transactions in these types of properties? When applied to properties which are income yielding, the method ensures that an investor-client is well advised as to value, since the method involves the stream of expected income, the residue of the lease, outgoings and acceptable returns on investment.

Valuers in Nigeria have had to, in the face of competing investment options, analyse returns on property investments. It is understood that return range between 3% and 8% in the major urban areas. Millington defined Year's Purchase as: "a multiplier derived from the rate of return which an investor decides he will require from a property, that is, the yield which he requires to obtain".

The principal demerit is that, it depends on the availability of comparable

Depreciated Replacement Cost Method

This method is based on the basic principle of land economy that the alternative to an existing building is a new one. Accordingly, an investor faced with an offer to purchase a ditched house on half an acre on Victoria Island for N8 million will ask himself what it will cost to build a similar house on half an acre of land on Victoria Island. His decision will depend on how will he appreciate current land values and construction costs.

The principal demerits are that the method seeks to equate cost with value and it leaves the estimation of costs to a valuer instead of a Quantity surveyor. It affords valuers a method of the valuation of properties which are not readily marketable either in sales or lettings.

The method applied depends very much on the skill of the valuer and as said in the business " the science of valuation is an art". Thus the current values ascribed to properties are not really a reflection of their investment values but are in consonance with the basic principle of land economy earlier mentioned that the alternative to an existing property is a new one. This, the investor who is prepared to pay N4 million for the property under construction has satisfied himself that it might cost him about N5million to build a new one in the same neighbourhood. He has therefore opted for the depreciated replacement cost plus land value method as against the investment method in arriving at his value.

3.3 **Computer Information Management System**

Computer information management system otherwise known as management Information system is a formal information network using computer capabilities to provide management with information necessary for decision making. This is made possible by the additional capabilities of computer to generate information-supporting decision-making.

To management, the management information system (MIS) is the very computer based information system that supports all their decisions. Hence, no matter what type of operations an organisation performs, the MIS must provide:

- Reports that are decision – oriented (accurate, timely, complete, concise and relevant).

- Room for expansion and growth, must be flexible enough to handle the organisation's changing needs.

- Result s that meet the user's requirements.

In the management information system are other subsystems that carry out specialized information roles. They are:

(a)   Management support system

(b)   The Decision support system

(c)   Functional information system

(d)   Office information system

(e)   Expert system.

The management support system is a subsystem that is aimed at helping manager make effective decision by providing them with reports that are timely as well as precise operational managers depend a great deal on the information from the report generated through the management's support system to make their decisions.

The Decision support system combines data with models and graphics to answer a decision-maker's questions about the data. If a decision is structured the management support system's reports are sufficient to make the decision. On the other hand, if the decision is unstructured that is if it cannot be made using clearly defined policies, then the models and graphics supplied by a decision support system must be used.

The functional information system enables the managers to obtain information in order to take or make decisions on the prospective functional area of a business in order to carry out its operations.

The office information system is a machine or machines combined with a communication system and users to make more efficient the job of obtaining, organising, storing, retrieving and preparing needed information. The expert

system is a new type of information system that is being used more and more to support managerial decision-making. It is an organised collection of people, procedures, database, and devices used to generate expert advice or suggest a decision in an area or discipline.

3.4.   Relationship Between Computer and Property Valuation

A computer can be defined as a machine which accepts data from an input device, perform arithmetic and logical operations in accordance with a pre-defined program and finally transfers the processed data to an output further capability of storing data as may be required.

This implies that computer processes or acts upon the data entered with the aim of generating an output which is regarded as information.

A computer system can be regarded as a set of interacting elements responding to input in order to generate output. It can also be defined as a collection of components, either physical or non-physical in nature, which interact with one another towards a common objective. These components need to function together in order to enable computer process data into information. There are three major components which constitutes a computer system and they are as follows:

-        Hardware

-        Humanware

-        Software

The hardware refers to the physical components of a computer. It is made up of the mechanical, magnetic, electrical and electronic devices of a computer the input, storage, processing and control devices are hardware.

The humanware comprises of human being who engage in the use of computers. They include programmers, systems analysts, systems engineers, computer operators and all other computer users.

The software is the general term used to devote all forms of program that control the activities of a computer. It refers to the set of computer program procedures and associated documentation related to the effective operation of a data processing system. The software enables us to exploit the capabilities of a computer.

The Architecture of the Computer

```
                    ┌──────────────────┐
                    │ Central          │
                    │ processing unit  │
                    │ (main memory)    │
                    └──────────────────┘
                             │
                             ▼
┌────────────┐      ┌──────────────────┐      ┌────────────┐
│ Input      │      │         Control  │      │ Output     │
│ Unit       │─────▶│         Unit     │◀─────│ unit       │
└────────────┘      │                  │      └────────────┘
                    │ Arithmetic       │
                    │ and logic        │
                    │ Unit             │
                    └──────────────────┘
```
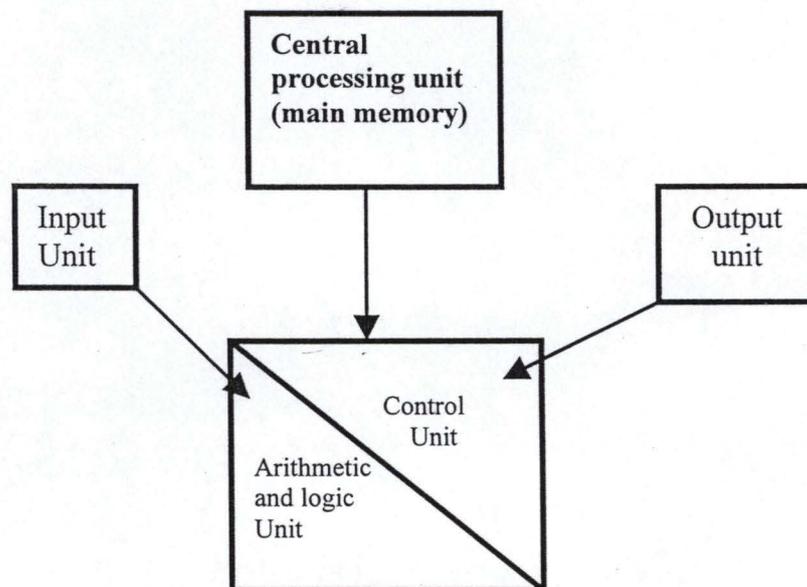
As earlier defined, Property valuation is the art and science of estimating the value for a specific purpose of a particular interest in property at a particular moment in time, taking into account all the features of the property and also considering all the underlying economic factors of the market including the range of the alternative investments.

28

The relationship between computer and property valuation is best defined in relation to its usefulness to estate surveyors and values. It must be noted that real estate valuations are made because someone has a problem. An investor is considering the purchase of a property and wants to know how much the interest in real estate that he might acquire is "worth". A lending institution has been asked to make a loan on a property, and the loan officer (and his superiors) used to know how much they can "safely " or "prudently" lend. A property owner is considering selling, and wants to know how his property is "worth". A tenant seeks to buy up the remaining term of his lease and wants to know how much he "should" pay. A government is intending of commercialize and, or privatize its assets and wants to know their values for floatation purposes at the stock exchange.

In these and countless other decision situations involving the use and transfer of real estate, a decision maker is confronted with a problem that requires an estimate of the value of specified rights in real estate in order to solve that problem. Such an estimate is a product of the property valuation work.

As noted above, decision-making is problem solving. It involves making a selection from among alternative courses of action to remove or circumvent deterrent to the realization of the decision-maker's goals. Thus, property valuation decision making process or valuation framework is a systematic process and analysis applied by the estate valuer to the solution for every valuation problem. Every valuation is a problem because the valuer must identify and select from several potentially applicable routes to estimating, a specifically defined value. Every valuation is also a form of research project because the estate surveyor

must identify and gather systematically the data required in the analysis. However, since valuation is both an art and a science it would be extremely difficult to present a generalized pattern of property valuation decision making process or framework.

As a research project, property valuation assignment involves four major steps.

(i)   Prepare an outline, a plan or blueprint for action by the estate surveyor and valuer.

(ii)   Assemble materials for analysis: Market and property data

(iii)   Apply appropriate tools analysis: Analytical techniques and approaches and

(iv)   Apply judgement to reach a conclusion: selection in terms of decision standards.

Elements or steps in estimating the value of real property could further be reduced diagrammatically as shown below:

```
┌─────────────────────────────────────────┐
│ PLANNING THE VALUATION                   │
│ 1.  Defining the valuation problem       │
│ 2.  Making a survey and plan.            │
│ 3.  Collecting and organising data       │
└─────────────────────────────────────────┘
                     │
                     ▼
        ┌────────────────────┐        ┌─────────────────────┐
        │ Apply approaches as│        │                     │
        │ justified by type of│       │      Income         │
        │ property and data  │        │                     │
        │ availability.      │        └─────────────────────┘
        └────────────────────┘
```

MARKET OR DIRECT SALES COMPARISON	COST	Gross Rent Multiplier	DIRECT INCOME CAPITALISATION
1. Select sales of comparable Properties. 2. Select units of comparison and calculate. 3. Adjust sales	1. Estimate market value of site. 2. Estimate re-production 3. placement cost of improvements. 4. Estimate and deduct depreciation from cost of improvement.	1. Ascertain gross market rental of subject 2. Derive gross rent multiplier from m market. 3. Estimate market value	1. Ascertain net operating income of subject. 2. Derive income capitalization rate from market. 3. Estimate market value of subject.

```
┌────────────────────────────────────────────────────────┐
│ Reconciled estimates of market value by various        │
│ approaches into a single estimate of market value.     │
└────────────────────────────────────────────────────────┘
```

Source Dasso, J,: Ring, A. A.; and McFall, D. (1972), Fundamentals of Real

Estate, Prentice Hall Inc. Englewood cliffs.

Some of the principles of a good valuation report include:

- Good English

- Brevity, simplicity and clarity

31

- Careful attention to the use of punctuation mark is essential, incorrect punctuation can so often destroy or prevent the intended meaning.

- Avoid colloquial words and phrases

- Choice of word

- Heading or title

- Must be set to a plan

- Should show opinion asked for

- Facts or opinion should be expressed as a deinite conviction and not as a qualified, or unverified, half-belief.

- Second hand and hear say information should be avoided.

- Opinion is the ultimate of a report and should be at the last paragraph.

- The report must be dated and signed : to mention but a few . Also, the essential contents of any valuation report are:

- The scope of the instructions.

- The name of the person instructing

- The purpose of the valuation

- The date of the valuation

- The property(ies) valued, the interests, the nature and the extent

- The nature of work carried out explicitly indicating any areas of work that might normally have been carried out but were not carried out on this occasion and the reasons, the assumptions made, and why.

Computers on the other hand display the following characteristics to a greater or lesser extent relative to their type and application:

- The ability of performs calculations at very high speeds.

- The ability to take in information and to store that information for future retrieval or use.

- The ability to take in and store a sequence of instructions for the computer to obey.

- The ability to obey a sequence of program instructions, provided the instructions are stored within the computer

- The ability to use simple logical rules to make decisions for the iv own internal control or control of some external activity.

- The ability to communicate with other systems.

- The ability to exploit a complex internal structure of Micro-electronic circuitry in a variety of ways.

With all these characteristics possessed by computers and the nature of property valuation expressed earlier, computer aids the art and science of estimating property values in the following ways.

- The ability to perform calculation at very high speed enables the valuer to carry out the science of valuation, which is calculation based on a particular method of valuation being used, with ease without any error due to minimal human interference brought about by the use of computer. It enables calculations which at times is time consuming and brain tasking to be done accurately at a very high seed.

- Computer enables quick and prompt retrieval of accurate and precise information in order to aid decision-making.

- Also through the management information systems and its various subsystems enable decisions to be made at various level and departments involved in the determination of property worths or value.

- Time is saved and resources are preserved. Error is minimized as no human interference is possible once the data and information is entered or supplied.

- The record keeping ability of computers aid the property valuer in the science and art of estimation as no method of valuation can be carried out without reference to previous similar exercise(s).

- Computers enable accuracy and helps build trust in the valuer thereby ensuring and establishing continuity in business

3.5   Programming

For a computer to be controlled it requires writing a program and this very act of program writing is referred to as programming. In view of this programme can be defined as a set of sequence of instruction which informs a computer of the steps required for achieving a defined task. Each instruction defines a basic operation to be perform, identifies the address of the data to be processed and the peripheral device to be used.

3.6   Programming Languages

There are now four generations, and with each new generation, fewer instructions are needed to tell the computer to perform a particular task. As languages become more readable by humans, they become less readable by hardware. The higher the language, the less efficient it is, in terms of processing

speed. There are two broad levels of languages namely, the low-level and the high-level languages.

The first and second generations

Machine–language programs, the first generation, were written at the most basic level of computer operation. Because their instructions were directed at this basic level of operation, machine language and assembler languages are called, collectively, low-level language. In machine language instructions are coded as a series of 1s and 0s.

The assembler language on the other hand brought about the second-generation era programming languages to the computer world. A set of instructions for an assembler language essentially corresponds on a one-to-one basic with those of a machine language. Like machine language, the assembler language are unique to a particular computer. Rather than a cumbersome series of 1s and 0s as in machine language assembler languages use easily recognized symbols, called mnemonics to represent instructions.

The Third Generation

The introduction of the third generation of programming languages, most of which are regarded as procedure –oriented languages, resulted in a quantum leap in programmer convenience and productivity. The flexibility of procedure oriented languages permits programmers to model almost any scientific or business procedure. Instructions are coded, or written sequentially and processed according to program specifications. Procedure–oriented languages are classified into three: Business, Scientific or Multipurpose.

- **Business Programming Languages:** are designed to be effective tools for developing business information systems. The strength of business – oriented laguages lies in their ability to store, retrieve and manipulate alphanumeric data. COBOL (Common Business Oriented Language), the first business programming language, was introduced in 1959, it remains the most popular. The intent of the developers of COBOL was to make its instructions approximate the English language.

- **Scientific Language:** are algebraic formula type languages. They are specifically designed to meet typical scientific processing requirements, such as matrix manipulation, precision calculations, iterative processing, the expression and resolution of mathematical equations, and so on. FORTRAN (FORMULA TRANSLATOR), The first procedure – oriented language was developed in 1955. It remains the most popular scientific language.

- **Multipurpose language:** are equally effective for both business and scientific applications. They are an outgrowth of the need to simplify the programming environment by providing programmers with one language capable of addressing all possible programming needs. The C language is a very popular example. It resembles assembler language and is becoming Increasingly important for microcomputer and system programming, because it is considered more transportable i.e machine independent. Other third generation languages commonly used in business are:

ADA- Developed in 1980 under the sponsorship of the U.S Department of Defense and (named after Lady Augusta Ada Bjoon, considered the world

36

first programmer) intended to be a standard language for weapons system, although it also has commercial applications.

APL- (A programming language). Introduced by IBM in 1968 is useful for processing large tables of numbers.

BASIC (Beginner's All –purpose Symbolic Instruction Code). Developed in 1964 at Dartmouth college, USA. It is the most popular computer language and can be used by beginners as well as experienced people. BASIC is an interactive procedure-oriented language that permits user and computer to communicate with each other directly.

FORTH Developed in the early 1980s by an astronomer to control his large telescopes. It requires little computer memory but does need a sophislicated and skilled programmer to write code properly.

LISP Developed at the Massachusetts Institute of Technology in 1958 to write programms for artificial intelligence applications. It processes characters and words rather than numbers.

LOGO Developed at the MIT, as a dialect of LISP and is known as a "turtle graphics" It is used to command a triangular pointer, called a "turtle" on a video screen to plot graphic designs. It is useful for teaching the fundamentals of programming.

MODULA-2 Developed in 1977 by Nicklaus Wirth, the author of Pascal. It combines the strengths of Pascal with the flexibility of C.

PASCAL Named after the seventeenth century French mathematician philosopher, Blaise Pascal Developed in the mid 70s. It takes advantage of structured programming concepts.

37

PILOT (Programmed, inquiry, enquiry or learning). A language designed as a special purpose language to develop computer – aided instruction program.

PL/1 (Programming language one). Introduced by IBM in 1964 as a language that combines the features of COBOL, FORTRAN, and other languages.

PROLOG Invented in France and used essentially in artificial intelligence research.

RPG (Report Program Generator) Introduced by IBM in 1964. A problem-oriented language that is limited to generating business reports.

SMALL TALK invented by Xerox Corp to support an especially visual computer system. Most commands are accomplished with the use of a mouse. The principles of small talk were adapted by Apple computer in its Macintosh computers. The fourth generation (4GL).

The tendency these days is software development is towards using high level, user-friendly, fourth-generation languages. There are two types of 4GLs.

- Production – oriented. Designed primarily for computer professionals, to facilitate the development of information systems. An example is ORACLE.

- User–oriented. This type of 4GL is primarily for end-users. Users write 4GL programs to query (extract information from) a data base and to create personal or departmental information systems. The dbase, now in its fifth version, is an example of user-oriented 4GLs.

   Fourth generation languages are effective tools for generating responses to a variety of request for information.

3.6.1 BASIC

The Beginners All-purpose Symbolic Instruction Code was developed at Dartmouth college in 1963. It is a high level language designed for people who have no prior programming experience and is one of the easiest of all programming languages to learn. It is widely used for scientific, mathematics as well as many business problems.

A very notable characteristics of BASIC is its availability on all Disk operating system (Dos). There are BASIC Interpreters and compilers depending on the version of DOS available.

BASIC encourages running the computer in an interactive mode. As soon as a program and some data are inputted into the computer, the compiler executes the program and produces the result back to the user immediately. This enables the user of find out whether the program is free of error and bugs.

There are various terms in use in BASIC. However below are some of the terms with their definition.

(i)   **Constant:** It is a data whose value does not change during the execution of the program. There are two types namely, the string constant and numeric constant.

(ii)   **Variables:** Data whose value can change during the execution of a program. This may be as a result of calculations in the program. A variable is either numeric or string.

(iii) **Variable Names:** They are temporary storage locations within the Memory of the computer to keep variables. They are in form of addresses which when referenced, make use of their contents at that point in time.

(iv) **Reserve words:** Sets of words that are meaningful to the computer or compiler. They have pre defined meanings within a computer language.

(v) **Assignment statement:** Used to assign values to a given variable name

(vi) **Arithmetic and Relational Operators:**- Arithmetic operators are used to perform arithmetic calculations. While the relational operators are used to compare two values.

(vii) **System Commands:** They are commands not preceeded by line numbers that aid in the processing of BASIC programs using BASIC interpreter. They include, List, Run, Save load, New, Delete etc.

(viii) **Input and Output Statements:** The input statement enable computer to transfer data or values to variable names. While the output statement enables computer to display or print a constant or the content of a variable name.

3.6.2 FORTRAN

Fortran which is a combination of the words formula and translation was developed by John Backus and his team at the International Business Machine (IBM) corporation in the United States between 1953 and 1957. It is the earliest high level language to be introduced.

Fortran was designed for scientific and engineering data processing which involves complex mathematical computation and manipulation and has been used widely for these purposes. It is designed as an algebra-based programming language. Hence, any formula that can be expressed algebraically can easily be expressed as a Fortran instruction.

Fortran makes use of columns in order to perform its tasks. The computer screen is divided into 80 columns and the Fortran program makes use of the columns as follows:

- Columns 1 to 5 – contains the statement numbers which are unsigned positive integer with a maximum of 5 digits.

- Column 6 is a continuation column.

- Column 7 to 72 contains the actual Fortran statements , where the body of the Fortran program are stated

- Column 73 to 80 are ignored by the computer and any statement written there in are not executed. The columns are best used for 12 identification, sequencing and any other purpose.

- The column number 1 is used to add comment to a program in Fortran.

Defined below are some of the terms used in Fortran programming.

(1) **Constant**: There are two broad categories of constant, Numeric and Character constants.

(a) Numeric constants are numeric digits of any form which have two distinct types the integer and the real. Integers constant are called a fixed –point constant which is any signed or unsigned whole number without a decimal point or other punctuation. Real constant are called floating- point constant which is any number with decimal point to the left, right or between the digits.

(b) Character constant is a string of characters proceeded and followed by an

41

apostrophe. The string a of characters could be collection of letter or numbers which are not meant for computations.

(ii) **Reserved word**: They are words meaningful to a Fortran compiler . They are part of the Fortran language and hence are not acceptable as variable names . some are, Read , write , do , continue, Print, stop, if then ,end. Etc.

(iii) **Relational Operators**: There are six relational operators in Fortran and they are;

(i) .EQ. = Equal to

(ii) .GT. = Greater than

(iii) .LT. = Less than.

(iv) .GE. = Greater or Equal to

(v) .LE. = Less or Equal to

(vi) .NT. = Not equal to

3.6.3 PASCAL

Pascal programming language was invented in 1970 by Professor Niklaus Wirth of Zurich, Switzerland. It was named after mathematician and philosopher, Blaise Pascal who invented the first mechanical digital computer among other things.

Pascal was designed to be a structured language which involves the idea that a good programming language should encourage the building of good program. The Language is also made to be implemented easily and efficiently on present day computers. With these and some other characteristics, the Pascal language is able to continue in functioning and existing till date.

A Pascal program is built with lexical tokens that is, a program header and the body. The tokens are either language symbols or basic entities constructed by the programmer.

Word symbols are reserved words, which are meaningful to the Pascal compiler. These are set of words with predefined meanings in Pascal programs and cannot be redefined by the user.

Identifiers are sequence of letters and /or digits beginning with a letter used for naming the various objects defined.

Numbers are represented in decimal notation only and they denote integer or real values. A number with a decimal point and /or letter 'e' is a real number, otherwise it is an integers number.

Label are unsigned integers in the closed interval from O to 9999. They are used for prefixing statements, if necessary.

Strings are character whose value is denoted by a character sequence enclosed within quotes. However if quotation marks must appear within a string, the marks are duplicated.

Comments are character sequence occurring outside character stings. They are enclosed within curly braces and cannot contain right curly braces. The symbols "(*" and "*)" are standard alternative representation for the curly braces respectively

Arithmetic and Relational Operators

Operators operates on one or two operands and performs a specific operation. The standard built in arithmetic operators in Pascal include the following:

(i)   + = Addition.

(ii)   - = Subtraction.

(iii)   * = Multiplication

(iv)   / = Division to obtain real number result.

(v)   DIV = Division to yield a truncated integer result.

     Truncation is the dropping of any digits to the right of the decimal point.

(vi)   MOD = modules to yield the remainder of a division.

Punctuation: The following punctuation rules are considered in Pascal program.

(i)   Semicolon : This terminates the program heading , declarations and separates

     each statement from the next .

(ii)   Commas : They are used to separate items in lists such as the names in a real

     variable declaration or the items in a WRITE and READ statements.

(iii)   The Colon: is used in several situation but in elementary programs . The main

     function is to separate list of items in a declaration from the corresponding data

     type name.

(iv)   The period ''.'' is used to terminate programs and always appear after the last

     end.

3 .7   The Cost Benefit Analysis

Cost Benefit analysis with its primary objective of determine whether investing

on a project is economically worthwhile, enables one to determine whether the use of

computer in property valuation is economically feasible or not. This involves weighing

the element of cost against the benefit accruable from such use or project.

In this write-up, the cost analysis will involve the cost of procurement, installation

costs, developing costs, and operating costs. While the benefits is derived in terms of

comparing valuation with the computer against valuation without the computer . The cost analysis involves the followings:

(a) **Cost of Procurement**: The following hardware will be required for effective valuation exercises.

(i) A monitor.

(ii) A keyboard.

(iii) The system (main memory).

(iv) A printer.

With the advent of various personal computer, there is variety in prices depending on the chosen system and model. A system can be assembled or bought as a whole. Averagely a good system will cost a couple of tens of thousand.

A good monitor/screen will cost between N12,000 and N14,000 and as already known, it is not advisable to be fixing prices as the market is not stable.

(b) **Installation cost**: This includes the charges on configuration by a system Engineer, purchase of a window unit air conditioner or a split unit as the case may be. There may be the need to create additional room or space for the system.

(c) **Developing Cost**: The development of necessary and relevant software like Database management, Spreadsheet, diskettes and the services of a programmer will be required, hence should be part of development cost.

(d) **Personnel Costs:** This may involve the training of the existing staffs on the use of computer or the employment of a professional to be in change of the operation of the computer.

(e) **Operating Costs** : This includes, the purchase of consumable materials like , tapes, cards disks, stationery, maintenance cost standby arrangements like generators, uninterrupted power supply and the comparative costs of alternative methods of processing

The Benefit Analysis: The benefit accruing from the use of computer in property valuation is best measured over a long period of time. Since it cannot just be once and for all, the benefit are not easily visible or noticeable, they accumulate over the years.

Since valuation is methodical and does not change over the year, lot of benefit is gained with the service of a good programmer who makes available written programs for the five major methods of valuation with these, the valuer will just need to be sure of the method to use, select the software/the program for the method, supply the data and have the result/feedback in few seconds. With this, the benefits accruing from the use of computers in property valuation is measured in terms of:

(i)   **Easy of calculation and working:** Whereby lesser or few efforts is required in calculating accurately the worth of a property. Datas are just supplied and the answers are received almost instantly.

(ii)   **Accuracy:** Error is so much minimized as compared with when done manually. This thereby enables the valuer to forecast and give accurate opinion that aids the management in decision making. Hence, giving credibility to the valuer.

(iii)   **Speed:** Much time is saved for other pressing matters as computer brings about the determination of a property's worth within a fraction of seconds hence aids the management or decision makers to decisively tackle urgent and prompt matters relating to property worth especially mortgage institutions.

(iv)   Using computer over a period of time helps build trusts and ensures continuity as it enable the valuer to be prompt, accurate and up to date in his professional duties.

46

(v)   The availability of various computer accessories like the internets too will enable the valuer gather information both internally and externally hence making him relevant to the whole world .

A very good example is Diya Fatimilehin and Co with its sister company Daniel Ford & Co in London. A visit to their head office will establish all of these benefits and show to the whole world what a computer can do in any business. There are lots of Estate firms which time and space will not permit me to list both locally and internationally who have gained a lot with the aid of computer.

In conclusion, the benefit can be summarized as follows:

-       Quick retrieval of accurate and precise information.

-       Enables record keeping as no method of valuation can be employed without reference to previous exercise(s).

-       With the various programming language especially the Pascal and Fortran, computer enables the science aspect of valuation to be carried out without any difficulty.

-       Time is saved and resources are preserved as no human interference is possible once data and information is supplied.

-       It build trust and ensures /establishes continuity.

-       It aids decision making through the various information subsystems embedded in the computer's management information system.

In all, the various characteristics displayed by computer stands to be the bulk of all the benefits derived from its use in any business especially the science and art of estimating the worth of a property which is, property valuation.

CHAPTER FOUR

4.0 DATA PRESENTATION AND ANALYSIS

4.1 USES OF BASIC LANGUAGE IN PROPERTY VALUATION

To determine the capital value of a property with an annual income of N650,000 per annum comprising three blocks A, B and C with approximate areas $73.246m^2$, $85.008m^2$ and $234.6184m^2$ respectively . The cost per metre square is taken to be N10,000, N10,000 and N15,000 respectively. While the Y.P (year's purchase, the multiplier) is taken to be 14% for a period of 10 years. Using both investment and the contractor's method of valuation.

Contractor's Method

Block A

Area	=	$73.246m^2$	
Cost/m2		10,000	N732,460

Block B

Area	=	$85.008m^2$	
Cost/m2		10,000	N850,000

Block C

Area	=	$234.6184m^2$	
Cost/m2		10,000	N3,519,276
Land Value (say)			N 350,000
Capital value (CV)			N5,451,736
Say	N5,462,000		

Forced sales value 2/3 of CV

$$2/3 \text{ x } N5,451,736$$

$$N3,598,46$$

Approximately   N3,600,000

Note: There may be the need to depreciate at 20% depending on the age of the building to arrive at the capital value. In this case the property is assumed to be new. That is, between 1 and 3 years old.

(b)   Investment Method

Rent (income)	=	N650,000 p.a.
Appropriate Y.P. in 10 years @ 14%		7.1429
Capital value		N4,642,857

Approximately N4,643,000

The uses of BASIC language in property valuation entails the followings:

(a)   The title and the programmers name.

(b)   Clearing the screen

(c)   Using the command words like "input enter".

(d)   Using the "GO SUB", the "if", "ELSE IF" and END IF" commands

(e)   The "PRINT" commands to display and print out the output.

(f)   The "RETURN' command to terminate the "GO SUB" command.

(g)   The "END" to terminate the process to prevent a situation of having an endless loop.

4.2 USES OF FORTRAN LANGUAGE IN PROPERTY VALUATION

This entails the following:

(a) Ensuring that the actual Fortran statements are contained in the columns 7 through 72 while columns 1 to 5 are used for statement numbers and column 6 used as a continuation column.

(b) The programmer's name is indicated and the purpose of writing the program stated.

(c) The need to signify and differentiate between the real number and the integers.

(d) The "READ" and "WRITE " commands are used.

(e) The "IF" statements to are employed, likewise the sub-routine.

(f) It also involves to use of the "GOTO" and "DO" statements.

(g) The "CONTINUE", "RETURN" and "END" statements are very essential too.

4.3 USES OF PASCAL LANGUAGE IN PROPERTY VALUATION

(a) The programmer's name and the purpose of the programme is stated.

(b) The use of the following commands are also employed, "BEGIN" "WRITE" "ENTER", 'READ IN", "WHILE – DO", "WRITE IN", "ELSE IF" and "END" statements.

4.4 PROPERTY VALUATION USING THE PROGRAMMING LANGUAGES

4.4.1 BASIC

This program was written by Omotosho Rotimi David (PGD/MCS/484) Being valuation using the contractors and investment methods

```
CLS: Screen 1
Input "Enter 1 for contractor's method and 2 for investment method", Ch
If  Ch = 1 then go sub 1Ø
Else if Ch =    2 go sub 2 Ø
```

```
        End if
        1 Ø contractor's method starts from here
        Sum    =        0
        Input "Enter length and breadth", l,b.
        A      =        l*b
        Input "Enter cost per metre square", cpm
        Value  =        cpm *A
        Input "Enter depreciation in percentage", dp
        d value=        dp/100 *value
        A value         =        Value – d value
        Sum    =        Sum + A value
        Next   1
        TSum   =        Sum
        Input "Enter value of land", Vol.
        CV     =        T sum +        Col
        FSV    =        2/3    *CV,
        LPrint "The number of blocks    =        ", blk
        LPrint "Capital value (N)       =        ", CV
        LPrint "Forced sales value (N)  =        2/3 of capital value  = ", FSV
        Return
        End
2   Ø This section is for the Investment method

CLS

Input "Enter the rent (income) per annum," Rent

Input "Enter the years purchase", Y.P.

C.V   =        Rent * YP

LPrint "Rent (N) =    ", Rent

LPrint "Capital Value (N)    =        ", CV

Return

End
```

4.4.2 FORTRAN

```
C       This program was written by Omotosho Rotimi David

C       (PGD/MCS/484) being valuation using the contractor's

C       and investment methods.

Real  L

Integer blk

Write (*,*) "Enter 1 for contractor's method  and 2 for investment method".

Read (*,*) ch

If (ch.EQ.1) Go to 1 Ø

If (ch.EQ.2) Go to 2 Ø

Sub routine contractor (Sum, blk, L, b, A, cpm, dp, A value, value, a value, Tsum,

vol, cv, fsv).

Sum    =       0.0

Write (*,*) (Enter the number of blocks for computation",

Read (*,*) blk

Do 1 J = 1, blk

Write (*,*) "Enter length and breadth"

Read (*,*) l,b

A      =       l*b

Write (*,*)  "Enter cost per metre square"

Read (*,*) cpm

Value  =       cpm * A

Write (*,*) "Enter depreciation in percentage"

Read (*,*) dp
```

```
d value         =      dp/100 *value

A value         =      value  -    d value

sum             =      sum    +    A value

1       Continue

        T sum  =       sum

        Write (*,*) "Enter value of land"

        Read (*,*) Vol.

        CV    =       T sum  + Vol

        FSV   =       2/3 *CV

        Write (*,*)    "The number of blocks      =       " , blk

        Write (*,*)    "Capital value (N)         =       " , cv

        Write (*,*)    "Forced sale value  (N)    =       ", 2/3 Capital value ', fsv

        Return

        End

2       Ø Subroutine investment (Rent, YP, CV)

        C       This section is for the investment method

        Write (*,*) "Enter the rent (income) per annum"

        Read (*, *) Rent

        Write (*,*) "Enter the year's purchase"

        Read (*,*) YP

        CV     =       Rent * YP
        Write (*,*) "Rent  (N) = ", Rent
        Write (*,*) "Capital Value (N) = ", CV
        Return
        End
```

4.4.3 PASCAL

Program valuation (input, output),

This program was written by Omotosho Romtimi David (PGD/MCS/484. Being

valuation using the contractor's and investment methods]

Var

I, Ch, blk: integer,

Sum, l, b, A, cpm, dp, d value, value, A value, T sum, vol, CV, FSV, Rent, YP, Real.

Begin

Write ("Enter 1 for contractor's method and 2 for investment method"),

Read ln (ch),

If ch = 1 then

Begin

(Contractor's method starts from here)

Sum = 0.0

Write ("Enter the number of blocks for computations"),

Read ln (blk)

Count = 0

While count < = blk do

Begin

Write ("Enter length and breadth");

Read ln (l,b)

A: = l*b;

Write ("Enter cost per metre square")

Read ln (cpm);

54

```
Value    =       cpm *A

Write ("Enter depreciation in percentage");

Read ln (dp);

d value      =       dp/100 * value,

A value      =       value  -        d value

Sum          =       Sum   +       A value,

End;

T sum:       =       sum;

Write        =       ("Enter value of land");

Read ln      =       (Vol);

CV:          =       T sum + Vol;

FSV          =       2/3 *CV;

Write ln  ("The number of blocks      =       ", BlK);

Write ln ("Capital value (N)         =       ",  CV);

Write ln ('Forced sale value (N) 2/3 of capital value', FSV);

End,

Else if ch    =       2       Then

Begin

(This section is for the Investment Method)
```

55

Write ln ("Enter the real (income) per annum');

Read ln (Rent);

Write ln ("Enter the year's purchase");

Read ln (YP);

Write ln ('Rent (N)   =   ', Rent');

Write ln (Capital Value (N) = ', CV)

End.

Enter 1 for contractor's method ansd 2 for investment method:1

Enter cost per metre aquare: 10000

Enter depreciation in precentage: 20

Enter value ofland: 350000

The number of blocks=3

Capital value (N=)=5451736

Forced sale value (N=) 2/3 of capital value= 3598146

Enter 1 for contractor's method and 2 for investment method: 2

Enter the rent (income) per annum 650000

Enter the year's purchase: 71429

Rent (N=) = 650000

Capital value (N=)=4642857

CHAPTER FIVE

5.0 RECOMMENDATIONS AND CONCLUSION

5.1 Recommendations

In view of the immeasurable importance of computer in day to day activities and business, I give the following recommendations.

(1)   Computer science should be introduced as a course in Estate management in our tertiary institutions all over the country where the course is available. Computer science should not be registered as just a course but as a compulsory course which must be passed before a student can graduate. To support this, it can be deduced that in the next few years, computer literacy will be as much as important as the ability to communicate in English Language in order to be relevant in any part of the world.

(ii)   More Estate firms, existing and the unborn ones, should explore the usefulness of computer in their day to day activities, administration and in the execution of the professional obligations and duties.

(iii)   Training of Estate surveyors in writing and understanding simple programs to aid in their effective professional management and obligation is highly recommended and inevitable.

(iv)   Estate Firms should ensure the training of their staffs in the basic knowledge and use of computer i.e. computer literacy.

(v)   Government should encourage people in using computers by subsidizing

the prices of computer, making available functioning and up to date spare

parts. So also Government should step up the awareness campaign about

computers and the wonders it can perform through seminars,

advertisement and active participation on the side of the government .

(vi)   In view of the rate and trend of scientific innovations and expansions,

Government should ensure a massive computer literacy right from the

grass root to the most sophisticated sets of people in the country.

Computer literacy in schools should not be left alone for the private

schools who can afford to have computers, public schools should be

adequately equipped as well, in view of the need for its literacy right from

infancy.

(vii)   Also, I will recommend the design of the various application softwares for

the various professional fields. As we have the software packages that

helps the Accountants, so also there should be standard softwares

applicable to other professionals like Engineers, Architects, Medical

Doctors, Pharmacist, Economist, Technologist and so on .These softwares

must be flexible for future adaptability.

5.2   <u>CONCLUSION</u>

Looking at the ways computer are becoming relevant and aiding the effective

communication as well as productivity, one will say that it has finally come to stay. With

the aid of computers, the whole world has turned in to a global village.

Information is easily obtained no matter the thousand of kilometers that may

separate the two locations. So also, computer literacy is fast spreading like a cancer.

Young people, infants are being introduced to computer at an early stage of their life's thereby making them not only to operate computers but also to repair computers.

In view of this write–up, many estate firms are embracing computers as a man would embrace air after being starved for few minutes. Estate firms would rather prefer computers now instead of an electric or manual typewriter no matter the make of the typewriter. So also, the ability to manipulate computers too is an added advantage and gives such surveyor an edge over his contemporaries.

Though computers are said to be able to perform magic, it should not be substituted for manpower. Over depending should be discouraged. So also, care must be taken not to force people out of their job thereby rendering them jobless. Efforts should be made in exercising the brain and the mind so as not to be redundant and unproductive.

In summary, computers have more positive effects on human life compared with the negative effects. Computers are neater, faster, effective, accurate and much more reliable in whatever capacity and for whatever activities.

On a final note, computers will be much more appreciated and embraced if individuals Estate firms, the tertiary institutions and the government would adopt the various recommendations given.

REFERENCES

AIREA (1978):   The Approval of Real Estate. 7th Edition, The American Institute
                    of Real Estate Appraisers, Chicago, Illinois

AIREA (1982):   Appraising in a changing Economy, collected writings of James L.
                    Gibbons. The American Institute of Real Estate Appraisers,
                    Chicago, Illinois.

AJAYI C.A. (1997): "Toward new directions for Property Valuation Practice in
                    Nigeria" The Estate Surveyor and Valuers, Journal of the NIESV
                    Vol. 20. No1. January, pp. 20 – 27.

ALUKO, B.T. (1982):'Principles of Valuation' being a lecture delivered at skill
                    improvement course on Real Estate organised by Chuztech
                    Resources Limited and the Nigeria Institution of Estate Surveyors
                    and Valuers, Lagos, August 31.

ALUKO, B. T.   'Property Valuations Made Simple '. Textbook Manuscript.

BAUM, A. (1984):   'The Valuation Profession In The 1990s', Estates Gazette Vol.
                    271, Pg. 427-431, August4.

BAUM A.E AND CROSBY (1988): Property Investment Appraisal, Routledge
                    London.

BAUM A.E. and MACGREGOR B.D. (1992), "The Initial Yield Revealed, Explicit
                    Valuation And The Future Of Property "Journal Of Property
                    Valuation And Investment, Vol. No. 4, Pp709 – 726.

BONBRIGHT C.(1937): The Valuation of Property Vol. 1, First Edition, MacGraw Hill,
                    New York.

BOYD T.P. (1992):   "New Directions For Property Valuation In Australia", The Valuer
                    And Land Economist, Vol. 32, No. 2, May Pp 85 – 89; 136.

DASSO, J., Ring, A. A. and MCFall, D. (1977): Fundamental of Real Estate, prentice
                    Hall inc., Englewood Cliffs, New Jersey.

FAPOHUNDA A.:   Understanding And Using Micro-Computers

FOREMAN, R.L. (1982): Communicating The Appraisal: A Guide To Report Writing,
                    The American Institute Of Real Estate Appraisers, Chicago,
                    Illinois.

GRISSOM T. (1985): "Value Definition; Its Place In The Appraisal Process", Appraisal
                    Journal, April, Pp 27 – 225.

HILL P, (1990):   "Market Value: New Dimensions And New Issues For Real Estate
                    Valuers", The Valuer, Nov. Pp 234 – 240.

HUNT B. (1991):   "The Market 1990 V. Spencer 1907", The Valuer, Nov. Pp 302 –
                    304.

.IDUDU O.J.A (1989): 'Mobilization of Private and public Investment in Property
                    Development'. A lead paper presented at the 19th Annual
                    Conference of the Nigeria Institution of Estate Surveyors and
                    Valuers held in Lagos.

IDUDU O. J. A (1990): Impact of Estate Surveying and Valuation in National
                    Development. A lead paper presented at the 20th annual
                    Conference of the Nigeria Institution of Estate Surveyors and
                    Valuers held in Owerri.

KINNARD, W.J.R (1971): Income Property Valuation, D. C. Health and company
                    Lexington, Massachusetts.

MARSHALL A. (1925): Principles of Economics, Macmillan, London.

MILLINGTON A.F.(1988): An Introduction to Property Valuation, 3rd Edition, The
                    Estates Gazette Ltd., London.

MUSTOE, N.E.(1960): Complete Valuation Practice, The Estates Gazette Ltd., London.

NIESV (1985):   Guidance Notes on Property Valuation, Ist Edition, Published by
                    the Nigeria Institution of Estate Surveyors and Valuers, Lagos.

RICS (1990):   Statements of Asset Valuation Practice (SAVP)
                    And Guidance Notes, published by the Royal Institution of
                    chartered surveyors, London.

OKOROR S.I (1994)   'Caveat Syndrome and the Estate Survey and valuation Report'
                    The Estate Surveyor and Valuer Journal of The Estate Surveyor
                    and Valuer Journal Vol. 18, No. 1. January, Pg. 22.

RATCLIFFE R.U. (1972): ' Is There a New school of Appraisal Thought? Appraisal
                    Journal, October pp. 522 - 538

ROBERTS J.R AND ROBERTS E. (1991), The Myth About Appraisals " Appraisal
                    Journal, April, pp 212 – 220.

UNPUBLISHED WRITE UPS AND HANDOUTS

ABDUL RAHEEM KOLA (1988) "Computer Programming Made Easy" A Step By Step Guide To Programming

PRINCE R.O BADMUS (1998): Lecture note on "Introduction to Computer system".

PRINCE R.O. BADMUS (1998): Lecture Note On 'System Analysis And Design