Employing Management Information Systems for Efficient and Enhanced Performance in the Case of Two Private Higher Educational Institutions

by
Addisu Abebe

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Addisu Abebe[1]

Abstract

Although its impact is not yet felt in Ethiopian businesses, Management Information Systems is an indispensable component of the management body in the developed world. This research endeavors to show the merits of employing computer based Management Information Systems along with Local Area Networking in private higher educational institutes. The study tries to provide factual and empirical reasoning backed by both qualitative and quantitative analysis to reveal the utility of introducing networked Management Information Systems.

Questionnaires were used to gather data in a selected private college and a university college. The collected data was analyzed and presented descriptively using texts, tables and graphs. Quantitative tools such as Net Present Values (NPV) and Payback Period computations are used to examine the feasibility of installing Management Information Systems for better performance. Whereas a single sample would suffice to arrive at fairly reliable result, this research was undertaken in two selected institutions with the intention of augmenting further the authenticity and validity of the conclusions.

Findings generally revealed that high operational costs are being incurred unnecessarily and the use of MIS can minimize these costs increasing the quality of performance. Data requirement of the managers are found to be inclined to data from supervisors, subordinates and past documents. In addition, the existing decision making system has limitations that can be mitigated with the use of MIS. According to the study introducing MIS along with LAN has proved to be an extremely promising field of investment that can enable to solve the aforementioned problems and lead to maximal returns.

1. INTRODUCTION

Time has passed since the epoch won the renowned coinage of being **"a*n Information Age*.**"** The existing society is no more the traditional one who does things randomly and arbitrarily: it is an information-oriented society who heavily depends upon information for its decisions. And more, the business organizations are no longer merely industrial organizations. They have evolved out of it and

[1] Assistant Graduate, St. Mary's College

they are, currently, knowledge and information-based organizations that heavily rely on information for whatever they do (Loudon and Loudon, 1998).

In the developed world, the value of information has appreciated from time to time and it has become a real power. It gives every competitive edge for businesses and the due attention is paid to it. Billions of dollars are allocated annually for projects of installing and expanding information systems. Producers of main products and components of information technology have already come to play a substantial role in the economies of nations more than ever. Outputs of information technology are more influential and are seen more conspicuously. How can one imagine of life deprived of such IT items like computers in this age of ours? It sounds too crude an idea to imagine an office without computers, to imagine a sales man without a cellular mobile phone, and worse, to imagine a university functioning without reliance over computers.

"Information is power" is one of the most commonly reiterated sayings these days. The might of information has long been accredited in the developed business world. As a result, the 'Information Services Department' has gained a permanent position in the organizational structure of almost all fair-sized business firms. In fact, it is organized as a functional department just equivalent to marketing, finance and other traditionally pervading functions. The amount of budget outlays allocated to improve and facilitate the service provisions of this information processing department is also exponential. The need for establishing a department responsible for managing information is quite understandable considering the fact that information is an invaluable resource with a more rapidly growing impetus than other resources.

While this is the status quo in the developed world, one would be soundly dazzled at the sight of the incredibly negligible consideration given to the value of information resources in Ethiopia. As in other under developed countries the 'Power of information' is not acknowledged yet. Few organizations have organized a unit responsible for information processing, and little is heard about Management Information Systems. Selling and buying information for price is not known yet.

In a nutshell, so little has been done about generating information that we have earned the nomination of 'Information Poor Countries'.

Given the expansion of global firms with the best management and intelligence, firms in the developing world should be aware of the needs of the day and equip themselves with the weaponry the tough competition demands. They need to, at least, retaliate successfully to the advances made by global organizations.

PHEIs in Ethiopia are by no means exceptions. Unless and otherwise they react to the dynamic changes shoving the globe, it would be inevitable that they be pushed away into the realms of non - existence. This fact becomes vivid when one considers how the shadows of globalization are lining in the market and how western universities are setting a foot in the market especially by way of online education and other mechanisms like joint venture with local colleges (A good example can be the case of African Virtual University). As a counter - reaction, the preliminary measure of the Ethiopian Private Higher Educational Institutions should be modernizing their administrative framework. Indisputably the value of information systems in this area is priceless.

This paper examines how the two colleges, St. Mary's College and Unity University College, can employ Management Information Systems, which is merely a single but invaluable component of computer based information systems. This measure would make the firms more efficient, reactive and agile so that they can effectively respond to the changes in their environment which, subsequently, would assure their long-run survival in the ever stiffening, fierce-competition economy.

1.1 Objectives of the Study

This study has five basic objectives. These are:

- Determining the key information requirements of management to reveal what data are more relevant for decision making in the institutions.
- Finding out the current condition of information management and the decision making system in the institutes thereby seeking for a means of improving it by the use of MIS.
- Conducting partial pre-feasibility study of introducing Management Information Systems to examine if such a project would be under the scope of the institute(s).

- Finding out potential future benefits MIS can offer to the institutions.
- Paving the way for future studies on the subject.

1.2 Management Information System and Higher Educational Institutions: Background Information

The 1995 government proclamation that gave private investors an entitlement to invest on higher education has radically altered the exclusive government dominance of higher education. Private higher educational institutions have mushroomed allover the nation and hundreds of millions of Birr has been invested on higher education by private investors since then. Considering the large amount of funds involved and the crucial role of colleges in developing citizens, it is evident that the improvement of the quality of the services provided by these institutes is invaluable to all stakeholders. The employment of **Management Information Systems** would be one step forward in the effort to provide better services at lower costs.

An offhanded observation would reveal that the educational institutions of Ethiopia have not been virtually responsive to the dynamic growth in the information communication technology. Information technology tools have generally two basic application areas in universities and colleges.

- **At the educational level: t**his is the application of different IT tools like video conferencing, video - texturing and other audiovisual equipment to facilitate the teaching learning procedures. It also includes expansion of education undeterred by space, i.e. distance education.
- **Managerial levels:** information technology, particularly Computer Based Information Systems (CBISs) is employed in different academic and administrative positions for better decisions.

Management Information Systems lie under the category of the second application area. The study area of this study will be related to this concern i.e. identifying the benefits of information system for private college / universities.

1.3 Limitations of the Study

Some of the expected shortcomings of this study are :

- Sometimes the truthfulness of the information given by respondents cannot be definitely assured. Respondents may give untrue data deliberately or unintentionally.

- Time and resource constraints also prevented comprehensive and full - fledged analysis in to the study area.
- Quantifying some factors is also another source of difficulty. Although serious deviation are unlikely to occur, there are chances that some factors are either undervalued or overvalued while estimating some possible benefits of MIS.
- Various constraints have limited the scope of the study so severely that it only proceeds half way to the analysis of the viability of the MIS project. Furthermore its scope is still limited to the analysis of quantitative factors though there might exit several other important qualitative factors.

2. LITERATURE REVIEW

Regardless of the various perspectives of defining the scope of the term, Management Information Systems (MIS) will have a single definite meaning in this paper:

> *Management Information Systems is a computer based information system mostly used at the middle managerial level of businesses for the purposes of meeting general information requirements of managers in the organization (McLeod, 1998).*

For further elaboration, the same author defines the term as follows:

> *MIS is a computer - based information system that makes information available for users with similar needs.... The information is made available in the form of periodic reports, special reports and outputs of mathematical simulation. The information out put may be used both by managers and non managers" (Ibid, pp 334).*

It has been a well founded truth that the employment of MIS, especially if compounded by networking, enables organizations to reap many benefits.

> *"Recent research claims that corporations like Amdahl Corporation, Allen and Hamilton, Silicon Graphics, to name a few, are getting returns on investment of 1000 percent (i.e. ten times the amount they invested). Here is why corporations, for better or worse, print more paper than all the publishers in all markets in the United States put together. In other*

words, most corporations are publishing machines. Corporate intranets turn out to be an ideal distributor of information ....." (Laudon and Laudon, 1998).

It is important to consider two significant issues that are crystal clear in the statement:

1) How firms expend unnoticed millions of dollars on published records and documents,
2) How investment on computerizing report producing is promising.

Currently a lot of workflow software and report generating softwares are being used to conquer the paper mountain. Especially where there are thousands of documents circulating throughout the offices in the organization awaiting the signatories of different decision makers, it becomes difficult to track when and where each report reaches and leaves each official. Many companies develop different workflow software that automate the physical work into a computer - based electronic information exchange (Ibid, pp 97). However, it is important to note that due to legal, cultural and other reasons, it is impossible to eliminate paper documents entirely.

Many western universities make maximum use of these opportunities. In big sized state universities, in fact, an information system is independently organized as a profit center. A good example is the University of Iowa where the Administrative Information System unit is organized as an independent profit making division. It provides different services for the different organs of the university, as well as to students services for price. Some of the extensive service facilities it provides are application software development, application software interpretation, database management and administration, information access and decision support and consulting etc.

Such an extensive level of expansion of information can eventually come true only if the foundations are laid today. This paves the way for a more comprehensive use of information technologies in the future. The work of a thousand miles begins by one pace. It is from such a small information systems unit such large divisions like Administrative Information System of University of Iowa evolve.

Many studies have been conducted on the identification of merits of MIS in universities in general. Some of the findings include the following:

- MIS gives substantial cost advantage by cutting down costs emanating from poor quality of reports like redundancy, incompleteness and inaccuracy.
- It makes better services possible by enabling timely, accurate and cost-effective decisions.
- MIS gives firms a competitive edge by making them agile in reacting and counter reacting to the changes in the competitive environment.

Analyzing the decrease in report - producing costs following the employment of MIS is not a new method used only in this study. In fact a study made by Donald A.J. Burum (1986) has made use of this technique and arrived at a conclusion very close to the objective of this study:

> *"In a manufacturing plant with about 2000 people, data processing produced 41 reports each month, with 131 copies and 140,000 pages distributed to 63 persons.... 32 of the reports were found to be unused. Eliminating the unnecessary reports by reducing the distribution of there reports has resulted in the removal of 300 filing cabinets from the shop floor and other saving amounting $ 100,000 a year".*

3. METHODOLOGY

3. 1. Subject Selection

The paper is a case study and all its results can not be directly extended to other institutions. Given the similarity of the basic objectives and operation of colleges and universities, however, it is likely that some conclusions be applicable in other similar colleges as well.

The two subjects of the study were chosen based on convenience. Colleges of relatively bigger size in terms of staff and student size were selected (In the year 1997 Unity UC had more than 11,000 students while St. Mary's College had more than 20,000 students including distance learners)

Larger firms were chosen for the following reasons:

- Decisions made by bigger firms are larger in number and also more complicated in nature. Thus the need of managers for MIS support accentuates with size
- All small firms in the long run aspire for larger sizes and this is inevitable in the stage of development of any surviving firms.

- The costs arising out of implementing MIS will be more bearable by firms with larger size. Even though MIS has positive contributions to make in firms of every size, it has a direct strategic importance in larger firms.

3.2 Method of Data Collection

Scheduled questionnaires were the main tools of data collection. Interviews were also commonly used in the part encompassing information requirements determination. However, interviews are not used as standard means of data collection in this particular study mainly for time and resource constraints.

Information requirements determination and investigating the feasibility of employing Management Information Systems in an organization is a complex procedure that requires the deployment of many resources. It requires a comprehensive understanding of the internal workings and the external interfering variables. Particularly where a research is conducted in more than one organization, the difficulty accentuates. Hence, the Critical Success Factors Approach is chosen for the successful accomplishment of the study under the given resource constraints:

Focus On Critical Success Factors (CSF): this approach is a widely used technique of user need determination (Greene, Francis and Loughridge, 1996). The focus on CSF reduces reliance on a pile of irrelevant data and reduces the area of study only on those points that managers of the organization classify as critical success factors. The middle-level managers of the organization themselves identified these CSFs using questionnaires. These CSFs were then classified based on the source of the data. The analysis was then made by comparing the value given to different sources of data.

Similarity of activities among the colleges, on the other hand, makes the data collection easier**.** Universities and colleges are service organizations that provide the same service (education) to people who want the same thing, students. There is a considerable similarity in their vision, mission and objectives as well as strategies and activities. Thus the questions in the questionnaire would not be interpreted differently in the two colleges.

3.3 Data Analysis Techniques

Descriptive analysis and statistical analysis tools including tables, pie charts, bar graphs and other statistical techniques are used based on necessity. In the results and discussions part further project evaluation quantitative techniques are applied. The main one of such tools employed in this paper is net present value analysis.

Net Present Value is the method of calculating the value that would be gained if the MIS project was launched as of today. It takes into consideration the time value of money and traces back the current value of all quantifiable future benefits and expenses, and the difference of these two, the net benefit, is called net present value. The MIS and LAN project will be accepted only if the net present value is at least zero. The study did not, however, reach the point where decisions of accepting or rejecting the projects are made as the pre-feasibility study on the part of benefits is not concluded.

4. ANALYSIS AND DISCUSSION

4.1 Data Requirements of Managers

Management Information System gives priority to relevance (Stairs, 1998). It is impossible to keep track of relevant and valuable data and avoid redundant data without the knowledge of data requirements of managers.

Presumably, managers in any institutions have well-defined sources of information that are: subordinates , supervisors, other units in the organization, out-of-institution sources, past documents of the organization-and other minor sources.

The subjects of this study were prompted to value and prioritize the data from the aforementioned sources based on their significance for the decision marking process and for the achievement of institutional goals.

The scales of prioritization and their weights were given in the questionnaires

Scale	Weight

- Extremely useful ……4
- Very useful……...3
- Fairly useful ……2
- Less useful ……1
- Valueless ……...0

The values given by the respondents were then averaged and described in the table below.

Data Source	Average Response Values of Evaluation	
	Unity University College	**St. Mary's College**
Subordinates	3.3	3.2
Supervisors	3.6	3.2
Other units	2.1	2.3
External Sources	2.4	2.4
Past Documents	3.2	3.6

Data from Subordinates was emphasized as valuable by the respondents of both Unity University College and St. Mary's College. This is basically because data from subordinates is the main basis of analysis for decisions to be made. The minimum value given for this source of data is 3.2 which means that such data are well above very useful.

Data from supervisors is also another emphasized source of information both in Unity University College. and St Mary's Collage. The above table vividly depicts that data from supervisors is even a much more valued category with an average value of 3.6 and 3.2 which is well above very useful. This is understandable as, in every environment, supervisors give orders, provide supervision and give feedback as well as evaluate employees. Usually employees have attentive ears to their supervisors.

As the above table reveals, historical data of the institutions are also equally valuable for the majority of the organizational units. This implies that many decision-making units require past references on similar or even distant cases.

On the other hand, data from other units in the organization and external sources were given relatively less ratings thereby implying that data from these sources are of less importance.

This information has useful implications for MIS. As the quality of decisions to be made in different organizational units is dependant upon data from subordinates, supervisors and historical data of the institutions the database would be organized in a manner that clearly defines the source of the data. Data entry would follow a specified format so that all information stored in the centralized database will have a description of when, by whom and from what department it was stored.

MIS can respond to this result by arranging its databases functionally. As the current situation dictates, organizational units are more intertwined with other units in their departments than with those outside. Thus, without disregarding the future and occasional need for integrated information routing, databases can be organization with more emphasis to functional information accessing. Furthermore, historical data would not be outdated or eliminated. It would be stored in the most accessible manner and made available for those who want to use it.

Management Information Systems with proper and advanced database management system soft wares would simplify access to these data. MIS would enable prompt access to qualified and relevant data through database querying tools and drill down report producing software.

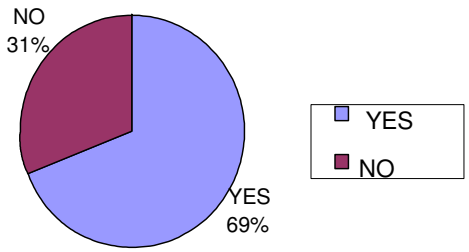
On the other hand, external data may be costly, as, in many cases, it is purchased from information vendors. Thus, MIS would need to be selective at acquiring external information as all units do not need it. MIS need to be cost effective and demand-driven at acquisition of external data through purchase. Data from less related organizational units would also be stored at central databases only in exceptional cases where its need is high.

4.2 Evaluation of the Decision Making Process

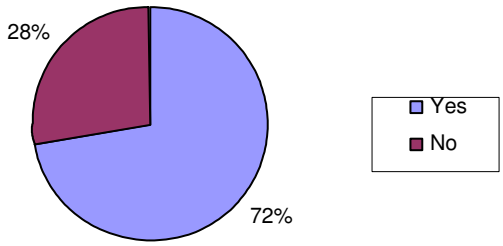
The first question presented to the organizational units of both St. Mary's College and Unity University College is stated as follows:

'Does your performance slow down because of the delayed decision-making in other units?'

l **Error!**



St. Mary's College



Unity University College

Fig 1 'Do slow decisions of other units hinder your activities?'

As it can be seen on the above pie charts, the majority of the respondents both in St. Mary's College and Unity University College responded positively(69% and 72% respectively). This shows that there is a problem of reaching at prompt decisions in the dif eges.

When coming to the analysis of why such a drawback exists in both colleges, the response seems to vary slightly. Both Unity University College. and St. Mary's College. look to be suffering from insufficient information handling techniques as 38% and 34% of the respondents respectively (the largest portion) claimed information related problems to be the underlying causes for the delay they make while arriving at decisions.

As a second reason, 26% of respondents in Unity University College. attributed their procrastination to make decisions to absence of other personnel who need to involve in the decision and 34% of respondents in St. Mary's College rated time shortage as the next basic cause. The third factor mentioned as a cause for delayed decision-making in SMC is absence (being busy) of other personnel involved in the decision making (at 18% selection) while, for Unity University College, time shortage takes the equivalent rank (for 17%).

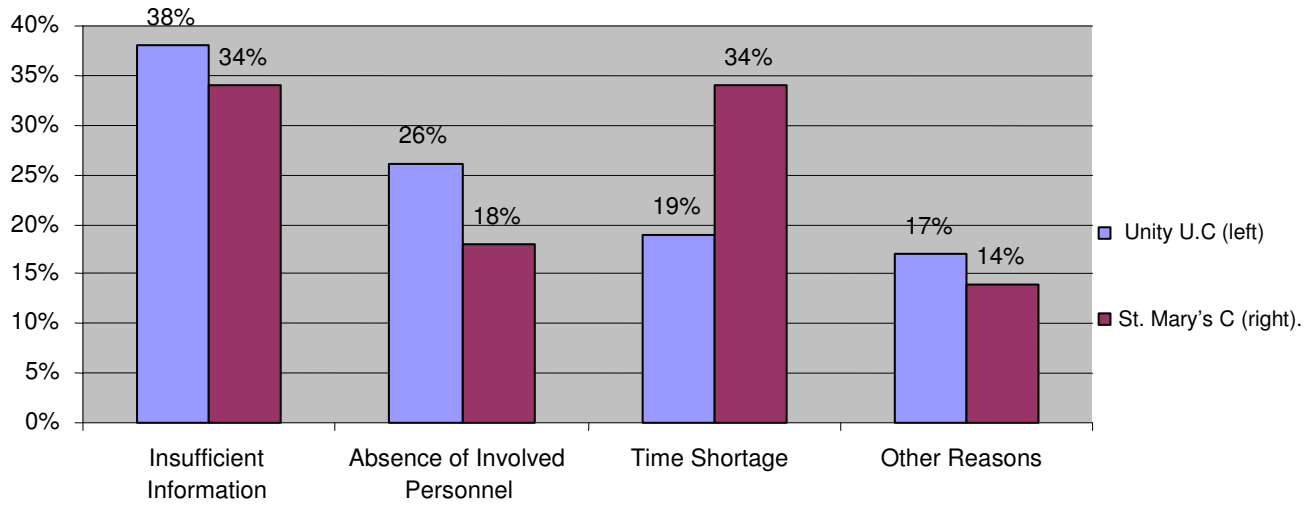


Fig2. Causes of slow decision making

It doesn't take an expert to comprehend at first thought that the factors mentioned as ' underlying causes for slowed down decision making' are caused by the manual information system, or in other words, could be easily alleviated with the introduction of computer based information system.

A computerized MIS can mitigate the problems in two ways:

- By providing a centralized database from which whatever information required can be drilled down using quarry languages and report generators in a moment (Loudon and Loudon 1998).
- By making the decision making process simpler and shorter (McLeod, 1996).

Availability of sufficient information at an arm's length avoids dilemma, confusion and uncertainties. This unquestionably facilitates prompt decision-making.

Management Information Systems can also shorten the life span of decision-making process. This is possible because, with the introduction of MIS, organizations become more decentralized, and people could make decisions by themselves without the need to consult their supervisors. Consequently decision makers do not need to wait for other people to be free. They could just make the decisions and the decision makers will have sufficient time to make their own decisions as they need to involve only in fewer decisions that directly concern them.

4.3 Evaluation of the Existing Reporting System

The subjects of the study were also enquired to examine the existing reporting system in the institutions by evaluating the quality of the different reports they receive. Because it is easier to identify the defects with somebody else than with oneself, respondents were enquired to find out the drawbacks of reports received rather than those produced inside the units. The options of defects respondents were supposed to identify in the reports were:

- Lack of clarity
- Redundancy
- Incompleteness
- Irrelevance
- Other defects

The following figure summarizes the percentage given for all choices for reports received in both colleges.

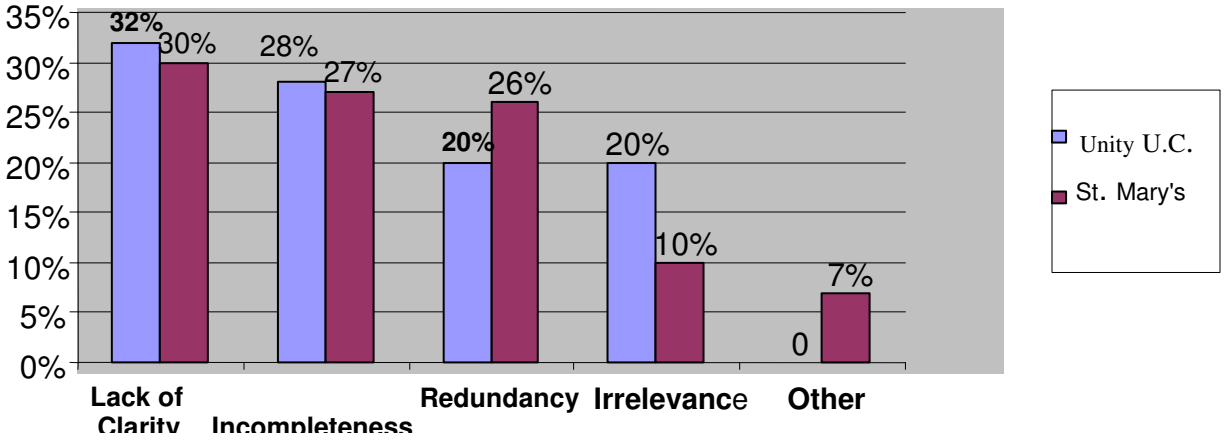


Fig 3. 'Summary of defects detected in reports received'

It can be seen that Lack of clarity, incompleteness and redundancy are the predominantly identified defects in the reports received from other units. Management Information Systems would have sharp influences on the elimination of these problems.

- **Lack of clarity:-** Reports are unclear and difficult to understand when they do not have distinct and understandable formats. MIS would completely resolve this defect by generating uniform format and user-friendly clear to understand reports (Brain,1998).
- **Incompleteness:-**Reports become incomplete and lack critical information for decision making when there is no mechanism of accessing information. MIS can fully eliminate such problems by providing centralized database loaded with all sorts of required information and enough accessing tools.
- **Redundancy: -** Redundant reports are produced either because of poor report-producing skills or due to the need to fill the gaps created by inadequacy of relevant data. Reporting software minimize the need for skilled report producing personnel as reports can be produced automatically. As a result, MIS will eliminate the occurrence of redundant reports in the institutions.

Generally MIS can make reports more clear, complete and precise and, along with Local Area Networking that facilitates electronic document exchange. It sharply cuts down report producing costs.

4.4 Pre-Feasibility Study for Introducing MIS and LAN: Unity University College

The basic theme in this study is analyzing the costs and benefits of networking the existing computers in the institutions and using MIS software and the Local Area Network (LAN) for proper management. New computers are not recommended in this study. The primary objective was to identify, compare and evaluate costs and benefits that would result from introducing LAN to determine whether or not it is viable to launch such projects. However, due to time and other resource constraints only basic cost components are identified and their costs quantified. This was

made in close contact with networking experts from NCR who were, at the time of study, in Jimma working for the network project of Jimma University.

4.4.1 Basic Cost Components (Quantified)

As new computers need not be procured, the basic costs are those for connecting the computers in the institutions and for new softwares.

I. One Time Costs

Basic one time cost components are Hardware, Software and Service costs

The items mentioned below are recommended because of their reliability, proved serviceability and economic nature. Thus they were forwarded by the consulting experts and the researcher as typical items, in their quality and cost, which could be employed to meet the requirements expected from the research. They are only selected as typical representatives for the type of equipment that need to be acquired. The detailed feasibility study is likely to identify other better items of the same or different brand, but their cost is expected to be within a short range from those recommended now.

a. Hardware

The major hardware components that need to be installed in the institutions to introduce MIS and LAN are file servers, switches, hubs, and cabling items.

- **File server**

Gateway®9415 rack mount server is made available for fair price by the international IT items manufacturer Gateway Inc. The total cost of acquiring Gateway 9415® rack mount server along with three years of spare parts and accessories, network managing software and installation service charges would be Birr 34,303.25. This includes custom duty taxes and 15% valued added tax.

- **Switches and Hubs**

For the 72 computers to be connected in the LAN, nine 8-port matching switches are necessary to enable proper networking. Getaway ™7401- 8- port unmanaged switch is recommended for the LAN in Unity University College. The unit cost of one switch is Birr 1,280 and the total cost of the required nine switches would be Birr 11,513.25 (including tax) For the 72 - workstation LAN in Unity University College nine 8- port hubs are needed. The hubs recommended for the LAN in unity University College are either fast 8- port 10 or 100 desktop hubs which are sold for a unit price of

Birr 549. Totally the cost of the nine hubs needed for the LAN would be Birr 4, 941 including custom duties and value added taxes.

- **Cabling Items**

From the economic viewpoint and the growing efficiency in its performances, unshielded twisted pair (UTP) is recommended for the LAN of Unity University College. Category 6, Category 5 or Cat5e Unshielded Twisted Pair (UTP) cables are usually preferred for modern networking projects using Ethernet technology. Analysis of distance among campuses and size of buildings reveals that, a minimum of 6000meters (18000ft) of UTP cables to connect the whole campus (including a reserve supply). A 1000ft long roll of UTP costs 60 USD. Including VAT and custom duties it takes Unity Birr 13,467.6 to network its campuses.

B) Soft ware

The operating software for network management is offered freely at buying Gateway servers. Various application software are in addition required to enhance proper decision-making.

College Office Student Information Management for Small Colleges and Universities

This software is developed by the Canadian Semafor Inc. to be used by smaller educational institutions throughout the world.

College office manages the following main entities:

- Student and Teacher information
- Courses
- Programs
- Student enrollment
- Departments
- Faculties
- Campuses
- Financial billing invoiced

College office has a powerful report generator that lets the user to craft his own reports. In addition College office automatically updates the values of all the calculated fields. Windows 2000 or XP are the best fitting operation environments for College office software. Some of the qualities of the software are:

- A friendly graphic user interface
- Powerful reporting capabilities
- Focus on all aspects of academic record keeping
- Network enabled
- Internet enabled
- Scalable
- Maximal flexible usage

College Office Multi User /COCM/ which can serve unrestricted number of concurrent seats costs $599 USD. The cost of the software in Birr including custom duty and VAT is Birr 6,450.

C) Cost of installation services

- **Networking service costs**

These costs are quite difficult to estimate even after survey is taken and half the job let alone before the anything begins. So as to avoid too unrealistic and half-baked conclusions, the researcher has chosen to proceed to the analysis phase with out these data.

- **Training costs**

A total of 70 people will be the immediate beneficiaries of the project as the LAN will have that number of nodes. Hence, at a training of one course is needed by almost all users. Taking the average training cost for one course to be Birr 450(approximate price charged by many colleges for a 40 hours training), the total training cost for the first year would be Birr 31,500.The training cost for the subsequent years depends on and is computed with development costs.

II. Recurring Costs

- **Development, Maintenance and Training Costs**

Additional features may need to be augmented to update the computational capacity of the department year after year. A study in some institutions reveals that organizations on average expend not less than 40% of their initial expenditure annually for the development of the Information Systems department (Arnold, 1999). Taking the figure at its face value, Unity University College.

expends a rough estimate of Birr 41,000 for improving the service provision of the Information Systems department.

- **Salary of Additional Personnel**

To manage a Local Area Networking employing various MIS software a team of information systems specialists is required. Two network administrators with yearly salary of Birr 24,000 are recommended for the initial information systems team of unity University College. Therefore, the additional salary of personnel is birr 48, 000/ year.

4.4.2 Benefits

- **Cost Savings**

Sensitive areas where MIS would enable cost savings are discussed here. The discussion, however, has a limited scope of giving indications of the possible benefits and does not quantify the exact amount of the benefits derived.

i. Reporting Costs

As it was discussed in the literature review, the introduction of MIS along with LAN would result in substantial reduction in reporting costs. The savings would result from reduced paperwork and printing costs.

ii. Telecommunication Costs

In the year 2004, Unity University College expended over Birr 185, 000 for telephone and Internet charges. With the introduction of MIS and LAN, the telephone cost would decrease considerably.

iii. Personnel Costs

The introduction of MIS along with intranets would significantly influence personnel costs for clerical employees like secretaries, finance and registrar workers and errands.

- **Errand**s (due to possibility of electronic communication)

Unity University College expends more than 37,000 Birr annually for office girls and errands Electronic communication would substantially reduce the need for such employees.

- **Secretaries**

Unity University College administers more than 33 secretaries who are paid more than Birr 300,000 annually.

- **Clerical Employees**

The computerization of communication procedures and report generating systems make some employees engaged in producing manual documents redundant. This includes Finance and Registrar Employees who are paid hundreds of thousand Birr.

Table 2 'Present Values of Costs of Introducing MIS'

Cost in Birr	Year					
	1(Beginning)	1(end)	2	3	4	5
One time Costs						
Hardware:						
Getaway Server	34,303.25					
Switches	11,513.25					
Hubs	4,941.00					
Cabling Items	13,467.6					
Soft wares:						
College Office	6,450					
Installation Services						
Networking Services	?					
Training Costs	31,500					
Recurring Costs	---					
Maintenance,	---	41,000	41,000	41,000	41,000	41,000
Development and training	---	48, 000	48, 000	48, 000	48,	48,
Additional Salary	102,175	89,000	89,000	89,000	000	000
Total Costs Discounting	1.00	0.9709	0.9426	0.9151	89,000	89,000
factor (3% bank interest)					0.8885	0.8626
Present Value of yearly Costs	102,175	86,410	83,891	81,444	79,077	76,771
Present Value of total cost	509,768	-	-	-	-	-

As it can be witnessed on the above table, a project of implementing Management Information Systems (MIS) along with Local Area Networking (LAN) in Unity University College needs a rough estimate of Birr 102,175 for initial investment excluding the cost of networking services. The present value of the costs to be incurred in the next five consecutive years is Birr 509,768 .The average development cost to be incurred in a single year is thus around Birr 102,000.

Although the analysis does not include a full quantitative description of benefits, the result helps as a foundation for future studies to conduct a complete pre feasibility study. At this level, the study shows that the project is under the scope of the college under question as it will take only 10 Birr annually and less than one Birr monthly of the fee the college collects from each of its students. Considering the absolute importance of MIS, this cost can not be considered unbearable. The decision of implementing the project, however, depends on the complete pre feasibility study, the full feasibility study and even on other related specific-subject studies. This paper is thus just a preliminary step in the analysis of the project.

4.6 Possible Future Benefits of Having Networked Management Information System

Just as many other investment projects, information technology projects are also incremental in nature. More advanced and sophisticated ventures are launched on the foundations of earlier established modest infrastructure and personnel. Introducing Management Information Systems and networking the computing environment are the preliminary measures towards further developments. The possible future outgrowths that can rely on this project include the following.

i. Web Based Communications

Currently the Internet is becoming a major tool of communication. Tremendous business transactions are also conducted across the net. Private higher educational institution can also make use of it in the following concerns.

- Web-based enrollment of students
- Web-based contact with students and parents
- Web-based procurement of materials etc.

ii. A Full - Fledged Administrative Information Systems.

A complex, full-fledged Administrative Information System (AIS) can be achieved progressively by introducing one part of the system after another. In large universities in the developed world, AIS is a well-established functional body with strategic importance. A good example is the case of AIS of Iowa University where departments are independent profit centers generating their own revenues and covering their own expenses.

iii. Wide Area Network /WAN/.

WAN is also one of the basic outgrowths of modest MIS and LAN projects. Wide Area Networking projects involve huge investment for personnel, infrastructure as well as operations. WAN projects have long been conducted among universities in many countries. Currently the majority of American and European universities are tied up into many groups of common WAN users (Arnold, 2001).Another example is Sheffield university which has interconnected campuses in Paris, London, Florida and New York.

This trend is also developing in Africa as it was witnessed presently in West Africa where national universities were connected with WAN and in Ethiopia, where a WAN Project connecting six public universities including Jimma University is currently underway.

When a group of universities are connected by Wide Area Networks (WAN), there are various economic gains derived. These economic advantages are so promising that they justify the huge costs of investment of switching into the option. Some of these benefits include the following.

- Shared Use of Resources,
- Economics of scale,
- Lower communication costs.

Generally speaking, introducing a computerized management information systems and establishing Local Area Networks (LANs) have a score of future benefits including laying the frameworks for the aforementioned developments, and for many other ones which would evolved with the dynamic technological enhancement.

V. CONCLUSION

This paper entitled *"Employing Management Information Systems for Efficient and Enhanced Performance in Private Higher Educational Institutions in Addis Ababa"* examines the possible costs and benefits of introducing management information systems in the Ethiopian private higher education context and how it should function.

The analysis spans five basic aspects of the institutions.

i. Data requirements of managers,
ii. Evaluation of the decision making system,
iii. Evaluation of the reporting system,
iv. Partial pre-feasibility study of introducing MIS, and
v. Future Advantages of introducing MIS.

The first part of the analysis, by the help of scrutiny of data sources for critical success factors, has found out that data from supervisors, subordinates and past documents are more valuable.

The evaluation of the existing decision making system detected various drawbacks in the current system. The major limitations inherent in the existing system were found to be procrastination, which was attributed to various factors like unavailability of data, involved decision making personnel being busy (absent) and time shortage. How such defects could be eliminated with the introduction of MIS is also discussed.

The evaluation of the existing reporting system also identified lots of shortcomings in the reports produced in the institutions. Disregarding the slight difference between the results in the two colleges, the common problems netted are lack of clarity, incompleteness and redundancy. The role MIS with a networked environment would play to the elimination of these problems was discussed.

In the pre-feasibility study basically quantitative benefits and costs resulting from introducing computerized MIS and the possible results of installing MIS and LAN are discussed. Generally, the Present Value (PV) of the average annual cost of introducing a MIS project was found to be more than Birr 102,000 in Unity University College .This paves the way for the undertaking of the

complete pre feasibility study. The study does not include St. Mary's College as LAN is already available in the college.

According to the general principles of project management, the assessment made in this paper is simply a partial prefeasibility study showing merely green lights for further detailed feasibility study. It should be understood that the information may not be quite reliable and adequate to justify direct involvement and expenditure of funds.

The last section of analysis dealt with possible advantages installing MIS with LAN would offer in the future. Following the discussions made so far, the researcher would like to forward the following recommendation:

- **The two colleges should undertake detailed analysis to introduce computerized MIS**

As discussed in detail in the analysis part, MIS is the key to resolve almost all information and decision making related issues**.** With the introduction of networked **MIS**, report producing costs are sharply minimized, special concern is given to data requirements of managers , the decision making process is facilitated and the basement is laid for dynamic future developments.

The prefeasibility study has revealed that a project of installing MIS and LAN has an annual cost of Birr 102,000 in Unity UC. Though it is too early to claim with full confidence that installation of the system is feasible and economical operationally and technically, the cost shows that the project is not unbearable for Unity as it would take from the college only 10 Birr annually from the fee it collects from each student .

The pre-feasibility study cannot be taken as a sole tool of decision-making. Detailed feasibility studies may find out cheaper sources of infrastructure, better substitutes, and simpler methods of networking which may minimize costs. Or inversely, the results may by slightly leading to a reduction of the NPVs and increment of payback periods. However, substantial deviations are unlikely as careful considerations were given to all-important factors in the pre-feasibility study.

- **The Two Colleges Should Establish Separate Information Systems Departments**

Currently the task of centralizing the information management task has taken sway. Following the diversification of the fields of concern in the area and the growth in the role of information in the performance of organizations, IS is becoming amore crucial and independently administered division. Some of the benefits of having an independent MIS department are:

Simplifying the network infrastructure

- Minimizing maintenance costs
- Maximizing IT operational Efficiency.
- Enabling enterprise-wide deployment of resources.

Unity University College and Saint Mary's Collage initially need to employ by far fewer personnel to establish AIS as a department. This is especially because the number of computers involved in their networks doesn't exceed 100 and the department does not engage in many complex activities unlike the thousands of computers that might involve in Iowa University's networks)

Thus, employing a network administrator and some technical people who would assist him would suffice for the time

- **Controlling a Match between Organizational Objectives and IS Operations**

Once Administrative Information Systems department has been established, the main focus must be at keeping its operations in proper relevance with organizational objectives.

- ***Recommended areas for Future Studies***

Future studies need to fill up the gaps in this paper. The areas that need to be further elaborated include analysis of the top rated type of data on how they should be managed and stored. In addition a complete prefeasibility study needs to be accomplished by determining both quantitative and qualitative benefits and costs to be result from the employment of MIS.

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