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**AN EDUCATIONAL MANAGEMENT  
INFORMATION SYSTEM FOR THE  
NAMIBIAN MINISTRY OF EDUCATION  
AND CULTURE**

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May 1990**

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NAMIBIAN MINISTRY OF EDUCATION AND CULTURE**

**A Preliminary Assessment**

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## I N T R O D U C T I O N

This report, supported by USAID/Namibia through the Advancing Basic Education and Literacy (ABEL) project, details the observations and recommendations for an Educational Management Information System (EMIS) for the Namibian, Ministry of Education and Culture (MOEC). It is a preliminary assessment of:

- o the scale and scope of an EMIS for Namibia;
- o the requisite support necessary to ensure both effective planning and effective implementation, and
- o preliminary training and visitation opportunities for MOEC staff.

The subsequent observations and recommendations are based upon an on-site visit to Namibia during the period April 8 to April 23, 1991 by Kurt D. Moses, Director Computer and Systems Services, the Academy for Educational Development. Appendix A details the persons interviewed during attendance at the Etosha Conference for Namibia (from April 8 through April 12), during interviews in Oshakati and Ondangwa in the Owambo Region, in Rundu in the Kavango Region, and subsequent interviews throughout the MOEC in Windhoek. During his stay in Namibia, Mr. Moses visited 15 schools from primary through technical training colleges and met members of the donor community and union representatives active in educational reform.

Results of this visit have been integrated with the assistance proposal made to the MOEC by Florida State University--the group responsible for the Etosha Conference. Accordingly, the EMIS recommendations have been formulated in terms that support the planned, far-reaching effort at curriculum reform and teacher upgrading throughout Namibia.

Because of the comparatively short period of time for this visit, most attention has been focussed on actions for the next six months, in the context of the intermediate and long-term EMIS requirements. Estimates of cost in the recommendations section have been based upon a combination of overseas and Namibian personnel actively involved in formulating an EMIS structure.

## B A C K G R O U N D

An effective educational management information system (EMIS) has several characteristics which can be found throughout the world and in virtually in every school system. These characteristics include:

- Systems work best when they depend upon processes and information which is generated as a part of routine school or school system activity.
- Educational management information systems work best when the data are accurate, timely and reach the people who need to make decisions.
- The most reliable systems are those which require the minimum amount of work on the part of the school, and which depend upon special survey approaches for exceptional information that may be needed simply to answer specific questions.
- Most EMIS is a mixture of manual and automated activities -- the manual activities predominating at individual schools, the automated activities predominating at regional and head offices.

In addition to the above functional characteristics, there is as well a range of systems that fall under the general description of EMIS. It is the difference in these systems that largely defines the usefulness. In the case of Namibia, the country as a whole has yet to reach the first stage described below. The goal of the subsequent project is to assist Namibia towards a second stage and partial third stage development. The three stages of EMIS development are as follows:

### 1. STATISTICAL INFORMATION SYSTEMS (SIS)

The statistical information system is characterized by the compilation of historical data about the entire educational system. Such data are usually comprehensive, covering everything from students through teachers through facilities. The fundamental difficulty with the statistical information system, as useful as it is for preparing historical summaries of what has happened and providing background information for donor or project efforts, is that the information is typically too far out of date to serve as a basis for immediate policy decisions. The most common reporting for a statistical information system is the annual or bi-annual statistical summary of educational activities. Because the audience for such a report is frequently quite diverse, and frequently involves non-educational personnel, one tends to find summaries of activities, gross descriptions of inputs and

outcomes of education, and a level of generality which does not easily meet the requirements of professional educators.

Given the previous fragmentary structure of education for Namibia, the extent of statistical information varies dramatically from region to region and within the previous Windhoek departments. With the exception of the White Administration, most other previous administrations appeared to have statistical information based upon the Tenth Day Report, and upon periodic individual enquiries usually associated with request for teachers or request for facilities.

## 2. MANAGEMENT INFORMATION SYSTEM

A management information system is designed to provide periodic, that is multiple times per year, information on key activities within an educational system, that either the district, regional or head office may have some influence upon. The characteristic of a management information system is that it allows one to monitor performance against a set plan of action, and to determine if correction needs to take place during the course of a school year. As an example, a management information system would report quarterly about outstanding teaching vacancies and will identify the school, circuit and region in which such vacancies occurred. It shows where necessary special measures might be employed to fill such vacancies. In addition, a management information system gains its information from the transactional systems that support the core operations of a ministry. As an example, to determine the number of teachers employed, a management information system would typically take reports from the payroll records for teachers being employed, would draw information on existing vacancies from personnel systems already in place, and would derive current cost of instruction from expenditures derived from a financial system. In cases where automation has not extended to most basic levels of a system, some effective types of manual to automated devices would be employed. As one example, if the major source of information were individual forms, scanning machines would be used to scan a form to automatically provide numbers necessary for the system operation.

Another characteristic of a management information system is that it tends to be more thorough going and touches each and every part of a ministry operation. People from the stores clerk through the minister understand its use, support its use, and have trained, particularly the key educational managers (the principals and in some cases senior teachers) for the operation of their part of the system. In addition, the chief educational managers look to reports from a management information system as a means of judging their own performance, and attend to areas where they might improve.

Educational management information systems typically are not inexpensive to start up, and in the early phases are not inexpensive to operate. MIS efforts arise from the necessity to increase communication between outlying areas and head office, and in addition, the necessity for fairly continuous training, particularly in the first two to three years.

A management information system changes the organizational culture of an entire system, emphasizing attention to performance, and improving the individual assessment by managers and teachers to the things that they are actually doing. It is a characteristic of a properly functioning management information system that people understand that the things that are being asked about are the things the top managers and indeed the entire country care about.

### 3. DECISION SUPPORT SYSTEM

The decision support system takes the characteristics of both the statistical information system and management information system and focuses the information contained in both on specific decisions that top officials need to make. Whatever level at which a decision needs to be decided, the information system with a DSS consolidates such information. In addition, one of a chief characteristics of a decision support system is that it allows a manager to estimate the future based on past performance and upon changes in the external environment. As such, a DSS attempts to give the educational manager a more precise vision of what might happen in the future if certain things were changed now.

It is possible to use various simulations and models to help with estimating the future, but a decision support system integrates the existing information coming from the other two systems, and provides a degree of accuracy and indeed disaggregation (ability to look down to the school level) that other approaches simply do not provide. In most school systems, with the inadequacy of information, individual decisions are typically left to the school principal, to a circuit investigator or to a regional director. In effect, tasks and assignments are allocated to a local level, with mainly requests and appeals for funding come back up to a central level. In the past, decision support systems have reinforced and encouraged central level decision-making. With newer techniques and capabilities, decision support type tools can now be carried to the regional and even circuit level to assist educational staff close to the school operations to make better decisions than they have in the past.

In many ways a decision support system requires the largest amount of information of any of the prior systems. To be reasonably accurate on the national level, a decision support system requires demographic, economic, trade, employment, health and educational data to allow an educational decision-maker to project the future.

Decision support systems typically require a small cadre of well-trained planners even down to the regional level who can interpret various outcomes, bring together a fairly diverse body of external information, and manipulate fairly sophisticated computerized tools. Simple versions of decision support systems can be used that have a step-by-step process that is almost entirely manual, but these frequently take considerable time to complete, do not allow quite as many options as a decision-maker may desire, and sometimes are not available and ready to go when the "window" for a decision appears. As one example of a sudden opportunity, donor contributions to a country may suddenly appear and top officials must decide the best use of the funds. Effective use and support of a decision support system requires *good* planning skill and judgement.

These three types of information systems are basically all subsumed under an EMIS. In the subsequent section, we have described a path by which Namibia could aspire quite concretely to the second level of information system.

## O B S E R V A T I O N S

The following section describes opportunities within the Namibian educational system for dramatic improvement and for alterations to the existing system. These can support both improved effectiveness and lowered cost of present schooling.

### DATA ENTRY

1. **THE TENTH DAY REPORT CAPTURES INSUFFICIENT INFORMATION TO MEASURE CHANGES IN EFFICIENCY OF SCHOOLS, TO MONITOR BUILDING CONDITIONS, AND TO INDEPENDENTLY ASCERTAIN TEACHER AVAILABILITY.**

The present Tenth Day Report, which is completed by virtually all schools in all of the regions, requests inadequate information to determine some of the key factors in the present educational system. If one wishes to measure efficiency, one must know with a fair degree of certainty the amount of repetition occurring in each grade within a school. If one wishes to measure the presence of teachers and indeed their qualifications at a specific school, then the form needs to enquire about teacher presence. None of this is queried. In addition, there is no indication of textbook use, no indication of building size or condition, and no indication of current need for other support.

In comparative terms, the Tenth Day Report, although simple and apparently completed by all schools, has the bare minimum information necessary to operate, knowledgeably, a large quite diverse educational system.

The existing gaps in information could be obtained via a separate survey given to each and every school, however, the dearth of information in existing reports suggest that upgrading the amount of information available should be a routine process and, therefore, should require a major change in the existing Tenth Day Form or alternate form.

2. **CIRCUIT INSPECTORS ARE A KEY SOURCE OF INFORMATION AND REPRESENT THE MAJOR CONTROL FOR REGIONS WITH RESPECT TO ACCURACY, RELIABILITY AND CURRENCY OF INFORMATION.**

The circuit inspectors are virtually the only people who, on a routine basis, visit each and every school within a region. While there is serious undermanning in some

circuits and a continuing problem with petrol and vehicles for inspectors, these personnel seem to receive insufficient amounts of training and attention as regards effective completion of statistical information.

3. **AS YET, THERE SEEM FEW INCENTIVES TO MISREPRESENT INFORMATION AT THE SCHOOL LEVEL.**

In some countries, schools can obtain additional materials as well as teachers and support if they overstate existing enrollments. As a result, such efforts lead to inflated and biased information which then make subsequent reports quite inaccurate. At present, and from a very small sample, reporting in the northern part of Namibia does not seem to have become subject to this problem. The change in governmental administration, the need for a headmaster or a principal to personally attest to the accuracy of the information, and the tradition within most schools of keeping student records back for 20 to 30 years seems to encourage reasonable accuracy.

This pattern of "correct" administrative behaviour may not be quite so prominent in the new and temporary schools established within villages. There is a tradition of collection of base information and the tradition can be expected to continue for a few more years. During this time, the accuracy and validity of data collected will need to be independently audited.

#### MANAGEMENT

4. **PRINCIPALS, PARTICULARLY IN THE PRIMARY SCHOOLS, AND REGIONAL OFFICE STAFF DID NOT SEEM TO HAVE A CLEAR IDEA OF THE PREDOMINANT EDUCATIONAL PRIORITIES EMERGING FROM WINDHOEK.**

Principals, particularly in the primary schools, and regional office staff did not seem to have a clear idea of the predominant educational priorities emerging from Windhoek.

In selected areas with key staff in at least two regions, and in some seven schools, the top managers of each school or region, did not seem to have a clear idea of the priorities of the MEC at present. All were familiar with the change in grade structure from the Standard 4 and 5, for example, to grades 6 and 7, and all understood the necessity for conversion to English. However, as regards issues of efficiency, reduction of dropouts, or better use of facilities, this has not at all clear. In

two of the regions, the major attention was devoted to "platooning" in order to accommodate what at times were 10 to 15 % enrolment increases, in particular in upper primary grades.

As one example, school people who had completed the Tenth Day Report, a report with which everyone was familiar, seldom had copies easily available, and, seldom referred to the prior year's information to ascertain basic trends. The regional educational planners, however, did have such trends in mind and could usually find a looseleave notebook with prior information.

5. **PRIMARY SCHOOL PRINCIPALS AND SELECTED SECONDARY SCHOOL PRINCIPALS SERIOUSLY REQUIRE A MANAGEMENT AND MOTIVATION COURSE.**

In several of the schools visited, there were teachers outside of the class reading while classrooms full of children sat unattended. In other cases, teachers were in the teachers' lounge while 2 or 3 classes sat without teachers. These classes had virtually no supervision. In several instances, schools had a very elaborate schedule board with clearly defined responsibilities where teachers should be at every hour of the day. Yet, in these very same schools, students were sitting in classes without teachers, in classes without furniture, and in some cases in classes without textbooks. In one case, the principal only discovered these shortfalls when walking around with a consultant, but in another case, it seemed evident there was no concern whatsoever that classes remained unattended and indeed untaught.

In several instances, teachers were absent from the school. In one case, the principal had to ask someone else where the teacher was and it was reported that the teacher had been at a funeral. Since a school normally contained 40 teachers maximum, and in the case of the primary school, only 6 teachers, the principals' lack of knowledge as to the whereabouts of the teachers was quite surprising.

In addition to apparent lack of control or concern about the academic activities, the same principals evidenced little knowledge of the statistical information being compiled and passed to Windhoek, relegating that activity to the clerk. As such, they had little idea directly of the kind of information being reported, and this clearly must have contributed to a lessened capacity in the school to respond to new educational challenges.

While these comments do not directly relate to information, they do relate to the quality of information, and indeed as well the possibility of making changes in the prevailing conditions of a school.

6. **THERE APPEARS TO BE LITTLE CONTROL OVER THE DISTRIBUTION OF TEXTBOOKS BY EITHER DEPARTMENT HEADS OR SCHOOL PRINCIPALS.**

One factor in possible school improvement and educational efficiency is the increase in the distribution of textbooks. In the case of Rundu, most students had at least one textbook and others several textbooks depending on the subject they were taking. The textbooks seemed to be in reasonable shape, however, on occasion when textbooks were short and a student was missing, another student who used to share this book would not be able to do so. As a result, there was a highly uneven distribution of materials during any one class period.

7. **IT IS NOT CLEAR THAT CIRCUIT INSPECTORS, AND IN SOME CASES EVEN THE REGIONAL DIRECTOR, HAVE THE REQUISITE AUTHORITY TO DISCIPLINE RECALCITRANT HEADMASTERS AND IN SOME CASES TEACHERS.**

In part as a result in changing of administrative structures and politics in the existing operations, the ability of certain senior people to exert direct influence administratively on teachers and principals is not clear. Whilst some of the standard administrative mechanism such as the "stinker" letter are still used, their effect seems much less certain. In addition, there does not seem to be a conversion yet in terms of the minds of many of the people employed in the regions from the government viewed as a colonial structure to the government viewed as a system owned by the people themselves.

As a result, people still seemed to look to the government as a source of funds and a means of eradicating inadequacies alone -- not so cognizant of their role in redressing the situation. The authority structure of circuit inspectors, many of whom show a considerable commitment to performing tasks in support of teaching for the students, has been made considerably harder. Recent actions by the head office in Windhoek seem to have encouraged the breakdown of authority of circuit inspectors and indeed of some regional directors. This is apparent through, for example, direct mail the schools (approximately only 70 % of which actually arrived) and direct contact on some occasions between schools and head office. Diminution of the authority of a circuit inspector might in the short run eliminate certain inequalities, but it might also make it exceedingly difficult for Windhoek to make direct changes, and in fact to order certain policy changes and expect the administrative structure to carry them out. Unless the key elements of a school system, the provision of teachers, the provision of textbooks, and the

provision of school buildings is done on a completely decentralized basis, any reduction in Windhoek's ability to impose an administrative solution will be deleterious to the entire system.

## INFRASTRUCTURE

8. **THE SECONDARY SCHOOLS IN THE NORTH ALL APPEARED TO HAVE BASIC INFRASTRUCTURE ITEMS INCLUDING ELECTRICITY, WATER, TELEPHONE AND BASIC OFFICE EQUIPMENT, INCLUDING AT LEAST ONE ELECTRIC TYPEWRITER AND ONE COPY MACHINE.**

All the secondary schools visited in the north had basic administrative infrastructure operating in each school. Almost all had functioning copy machines and typewriters, and almost all these items were under a private maintenance contract to ensure reasonably reliable operation. An obvious additional investment and infrastructure, associated with a typically R6 to R7 million building facility, was the investment in hostel facilities as at the secondary schools well. Because of the necessity to board students at the secondary level, more basic investment was made for each of these secondary schools.

As indicated by the Rundu Combined Secondary School, the private formerly White Only Administration school, it is quite possible to support a micro computer installation, and to have sufficient staff present to operate it.

9. **THE PRIMARY SCHOOLS IN THE NORTHERN REGION HAD VERY LITTLE INFRASTRUCTURE INVESTMENT AND VERY LITTLE INFRASTRUCTURE SUPPORT.**

With the exception of one boarding primary school which was previously a high primary, none of the primary schools visited had electricity and most had no water nearby. In addition, office equipment was extremely elementary, generally consisting of a single manual typewriter used to complete the Tenth Day Report and also to complete certain forms sent on to parents.

The office staff in many of the primary schools, if the schools were large enough to have their own principal, typically consisted of a junior teacher and periodically, a secretary. Record-keeping at the primary level seemed to be kept to a minimum, and aside from rosters for teachers, mounted on a board near the office, a very few other direct records except for that of student grades were kept. As noted earlier, student attendance for primary school is kept as a record for at least half a

century, and most principals took it as a matter of course that this would be the case.

10. **TWO REGIONAL OFFICES HAVE TELEFAX MACHINES, THE ONDANGWA OFFICE MACHINE HAD NOT YET BEEN CONNECTED, IN RUNDU THE FAX MACHINE WORKED ROUTINELY. WITH SOME DIFFICULTY, TELEPHONE COMMUNICATION WITH WINDHOEK IS POSSIBLE ALTHOUGH IT HAS TO BE SCHEDULED AND BOOKED THROUGH AN OPERATOR.**

One of the basic requirements for rapid procurement and administration is notice by telephone that something has or has not happened. This is quite possible for the regional offices. While, this procedure operates for schools in town and for the regional office, it does not work at all for circuit inspectors who have to rely on physical presence in a regional center before notice of a problem can occur. Notification that is entirely dependent upon a circuit inspector being able physically to get from the site where the problem is to the regional center and then to wait for a resolution of a problem, and then in the case of textbooks, later return to the school to ensure delivery can take months.

According to several procurement officers at the Rundu regional center, there is now a twice weekly long range transport between Windhoek and Rundu, which has reduced considerably the delay for items that are ordered from Windhoek.

## R E C O M M E N D A T I O N S

In the following sections we describe the steps that the MOEC should take over the next three years to install a systematic Educational Management Information System. In addition, we make several recommendations about organizational and procedural changes needed to provide direct support to important decisions made within the Ministry.

### OVERALL

1. **THE PRESENT DATA CAPTURE INSTRUMENTS AND SURVEYS CLEARLY SHOW THE LEGACY OF THE PREVIOUSLY FRAGMENTED EDUCATIONAL MANAGEMENT STRUCTURE. SOME EMIS ELEMENTS OF THESE SYSTEMS SHOULD CONTINUE TO BE SUPPORTED IN THE SHORT RUN.**

As noted in the observations, the 10th Day report just sent out for system-wide information contains too little information to serve as a basic instrument for EMIS data collection. There is however a revised "2nd Tuesday in March" collection instrument which is more comprehensive but still lacks queries regarding instructional materials, and some information necessary to meet the conditions of the USAID supplied program funds. See Appendix B for this list.

At the same time, two previously developed systems, the computerized CLASS system for previous White Administration schools and the DNE data collection efforts should be supported in the short term. These two systems provide quite comprehensive information and in the first case, educational information flows directly from the day-to-day administrative activities within the schools. This latter situation is typically the most accurate, and requires the least additional work to complete. Within the next six months, it should be possible to construct a very simple conversion program to take CLASS report output and convert it to a common, MOEC wide standard. For the long-term, the CLASS system, written in the COBOL computer language with second generation techniques probably should not be continued--but only after something better is available.

2. **A MAJOR INITIAL GOAL FOR AN EMIS SHOULD BE DEVELOPMENT OF BASELINE INFORMATION, AND THIS INFORMATION SHOULD BE FULLY ACCESSIBLE AT THE REGIONAL LEVEL.**

The MOEC needs, as soon as possible, country-wide baseline information about students, teachers, curriculum, facilities, and availability of instructional materials. It also needs information that has been "spot" audited to make sure that major data capture mistakes or misunderstandings have not occurred. This baseline information is needed very

soon since major interventions through training, additional schools, and teacher instruction are about to start. Lacking baseline information, it will be very difficult to determine if the interventions are going according to plan, and whether real changes (as opposed to simply data inaccuracies) are taking place.

The results of this information gathering should be accessible, on a timely basis, to the six regional offices. These offices should have the capability to make year to year comparisons, school to school comparisons--particularly as regards workloads on teachers and availability of instructional materials, and have such information within two to three months of its collection.

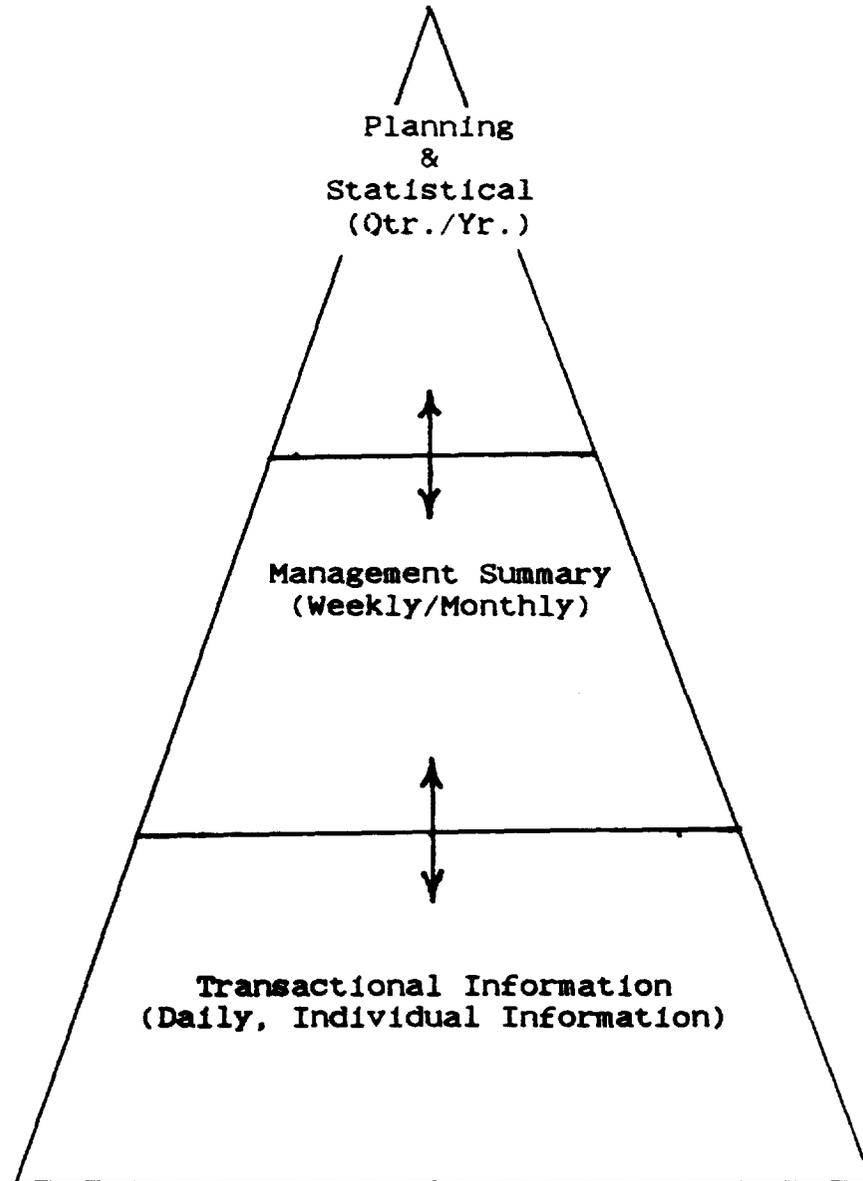
At the same time, one specific unit within the Ministry, preferably the Planning Unit, Information/Statistics/Data group, should have responsibility for consolidating this planning related information. Additionally, the baseline information collection should not be so detailed that errors are more frequent and return rates are lower. The Planning Unit might decide to attach a single "variable" sheet to the January, March or June survey questionnaire to request special information that may be asked only once in five years.

3. **FOR THE IMMEDIATE FUTURE, THE MOEC SHOULD PLAN FOR A MEDIUM LEVEL EMIS GIVEN AVAILABLE FUNDS AND PERSONNEL.**

The MOEC has several possibilities open to it as regards an EMIS. One level of EMIS is a LIGHT EMIS, in which information is oriented most to planning and largely depends upon a data questionnaire. Such information is most available at the Head Office and in the Regions. Schools supply much of the original information, but receive little by way of reports back. Transactional information generated (as noted in the attached Exhibit) by daily activities for personnel, finances, and student actions is not really accessed. The data questionnaire is the major source of information.

A MEDIUM EMIS includes data sources not only from a planning questionnaire, but also from personnel files, and financial records generated by the Government of Namibia's transactional systems. One such system is that responsible for payroll for all teachers and MOEC administrators. In addition, some planning data is derived directly from school records that have been automated. As a result, planning data comes directly from transactional information generated at the school level. The immediate workload on school administrators is lessened, and usually the accuracy of

**EXHIBIT 1**  
**LEVELS OF A MANAGEMENT INFORMATION SYSTEM**



information is higher. Given the funds available, MOEC has the best option of achieving this level of sophistication and of perfecting, for the Head Office level, more of the Decision Support System type tools. Under this level of EMIS, Regional offices will have enough computers to provide them, for their own region, the same information being reviewed at the Head Office level.

HEAVY EMIS is basically a system constructed from the transactional level on up. Specifically, since the schools are the point of activity for the MOEC, the basic administrative and managerial functions of the school are automated, and the daily, individual transactions at each school are summarized periodically for reporting purposes. Hence, information begins at the lowest level and moves upward, with summary reports provided back to the schools comparing their activities and efficiencies with other schools. Similarly, Regional comparisons can also be made. Significantly, staffing levels, authorized positions, and expenditures are recovered from the MOEC organization at which decisions or financial commitments are made. Hence, information is as up-to-date as the decision source.

The major factor preventing a HEAVY EMIS installation in Namibia at this time, is the need to commit at least \$2,500- -approximately R 6,000 in all 1,711 schools in the system. This would mean a capital expenditure of R 10.3 million as well as another R 5.0 million for supporting automation in the Head Office to integrate Personnel and Financial functions. A capital expenditure of approximately R 15.3 million would also imply annual operating support costs of about R 1.6 million.

4. **MOEC NEEDS SCHOOL MAPPING INFORMATION LINKED TO POPULATION INFORMATION, AND IT NEEDS THIS INFORMATION PRESENTED IN A GRAPHICAL FORMAT.**

With the unification of the educational system, it has become apparent that there is insufficient information about the exact location, condition, and requirements at schools throughout the country. The problem is most acute in the North, but other areas also suffer from this situation. Specifically, since capital investment decisions are made centrally, with some regional input, and typically with only rudimentary population data, it is clear that there may be considerable misallocation of school placement.

Secondly, since school placement is almost always influenced to some extent by political considerations, the ability to site schools according to professional criteria linked to population size and movement is quite important. Recent advances in computer graphics, specifically, Geographic

Information Systems, allow planners to quickly present complex information in an easy to understand format. Accordingly, one of the goals of the EMIS activity should be to integrate available information into an easily understood graphical format--presenting enrollment, teacher, facility use, and textbook use data according to geographic and school location. Such presentations should assist politicians better understand where resources, both human and financial, should be targeted.

## MANAGEMENT

### 5. **INFORMATION COLLECTION AND USE TRAINING IS NECESSARY FOR SCHOOL PRINCIPALS, CIRCUIT INSPECTORS, REGIONAL DIRECTORS, AND SELECTED MOEC STAFF.**

Because of the structure of the current system, and the expectations for a Medium Level EMIS, the key participants are in need of specialized training--both in information collection and use. The key actors, particularly in the North and for the more rural sections are the circuit inspectors. As noted in the observations, this group serves as a conduit between the central authorities and the schools for needs and requirements. Despite shortages in staffing these positions, this group needs to understand how and why such information is to be used. Circuit inspectors also need to be supported in both seeing and becoming more responsive via the information that they collect and report. Particularly for circuit inspectors, if information results in action then information will be more accurate and forthcoming.

In the case of regional staff, one of their major goals should be to assist central MOEC authorities reduce the disparities in personnel, facility, and instructional materials support among schools. Most often, rural schools suffer the most in terms of resources. Hence, regional improvement in reducing disparities can only be accomplished when such comparisons between schools are well made and understood.

For MOEC staff, the results of analysis among schools should inform the political and bureaucratic leadership in Windhoek to establish clear policies on the alleviation of regional, circuit and school level disparities. Hence, the analysis needs to be informed both by what disparities exist, and more creative and cost effective means of reducing school disparities.

For school, circuit, and regional staff, carefully prepared in-service programs will be most effective. These training

programs should occur on-site in each location and be built around actual experience and limitations of the relevant region. Such training should also be the occasion for improving administrative coordination between the regions and Windhoek. It is estimated that the largest source of improved coordination should focus on personnel actions and supply of instructional materials.

For central MOEC staff, it is important that the overall requirements for an integrated system be clear. Accordingly, we recommend a combination of on-site and off-site training. Particularly in the area of modeling to determine the effect of various decisions, we recommend some one to two month educational planning courses, some available in Europe, some in the United States. In addition, as part of the comprehensive training, we recommend recurrent training, partly conducted by Windhoek staff for principals and regional personnel. Some of this training should be linked with broader curriculum reform improvements, and its consequent training.

Such training will become effective as it is perceived to affect communications between schools and Windhoek, and result in improved responsiveness on all the issues that affect school operation.

## INFRASTRUCTURE

6. TO SUPPORT AN EMIS, REGIONAL OFFICES AND MOEC WINDHOEK WILL REQUIRE ADDITIONAL COMPUTER SUPPORT. IN SOME INSTANCES, CIRCUIT OFFICES AND SELECT SCHOOLS COULD ALSO MAKE USE OF SUCH SUPPORT.

To support a more accurate and rapidly responsive EMIS, regional offices can make use of several microcomputers, the key one of which supporting data capture of various planning forms. Currently, as opposed to several years ago, microcomputers can now provide most of the necessary storage and computing power to support a system the size of the MOEC. Such computer hardware and software, typically built around a "user-friendly" database, can also serve to speed various paper intensive processes.

For the MOEC Windhoek offices, newer generation, high capacity microcomputers can serve most of the major functions in support of planning and other selected functions--including personnel and bursaries. At least one of the microcomputers should have high capacity graphics capability, and one should be linked to a scanning device to speed paper based processing of planning information. For

the MOEC, these computers should be networked--linked to one another via software supported within Windhoek.

7. **AS SOON AS FEASIBLE, THE ORACLE BASED SOFTWARE SUPPORTING THE EXAMINATIONS SYSTEM SHOULD BE FULLY DOCUMENTED AND EFFORTS MADE TO TRAIN ADDITIONAL MOEC STAFF IN ITS USE AND MODIFICATION.**

As noted earlier, the existing examinations software now seems to operate comparatively free of "bugs" after approximately two years of intensive operation. Operating on a Hewlett-Packard 9000-85S minicomputer with 29 terminals, the software prepared by an RSA firm does not have complete documentation--particularly of selected C language routines. As a result, the MOEC is in a riskier position than need be--particularly if during the next two years, changes need to be made to the software. As importantly, the rigid timetable to which Examinations must adhere puts considerable pressure on the entire examinations operation. There are few resources in depth to overcome unexpected problems.

Such documentation could be accomplished by a skilled programmer or technical writer working with a software specialist in one to two months elapsed time. Of particular concern is the need to provide:

- o a complete flow chart of the program operation;
- o internal documentation for the several C language routines used within the examinations package;
- o at least two other persons with operating experience on the software--at present the most experienced programmer resides in the RSA.

This effort, particularly the training component, could be accomplished in conjunction with more specialized training for MOEC staff.

#### PLAN OF ACTION

8. **THE FOLLOWING ACTIVITIES SHOULD TAKE PLACE DURING THE NEXT YEAR.**

The MOEC should initiate the following activities during the next year.

- a. Using both expatriat and local staff, develop a more comprehensive EMIS plan, indicating exact functions to be automated, priority regions, circuits, and in some instances schools, and indicating exact staffing needs. The plan should include a more detailed three year timetable for action. (Time, one month)

- b. Develop a substantially revised data survey, using as a basis the 10th Day Report, and including the essential efficiency measures that are part of the conditionalities of the USAID assistance. As a minimum, repeater data as well as instructional materials data must be part of the new instrument. As part of this effort, the MOEC needs to conduct training particularly with the circuit inspectors who will be responsible for its effective completion for rural schools. The survey should be sent out, a minimum, twice per year. (Time, three months)
- c. Conduct a three day, intensive, financially oriented modelling workshop. This workshop should be attended by the key Ministry decision-makers and should be focussed on estimating the cost consequences of various proposed efficiency measures. As one example, with an estimated 12 percent increase in enrollment in the North, the modelling workshop should allow estimates of how rapidly certain efficiency measures can be expected to result in cost savings. In addition, the workshop should provide estimates of shortfalls between estimated expenditures and available government revenue. These estimates should become the basis for alternative strategies--including further NGO involvement, self-pay by some parents, and selected donor support. (Time, one month including preparation)
- d. Develop the format and specification for a multi-year EMIS database based upon the necessary data elements derived from USAID requirements, previous forms and efficiency data. Check the specification with regional offices and develop a strategy for using a reduced version of the database for each regional office. Develop a collection strategy for the more comprehensive form, including necessary on-site training for circuit inspectors and selected principals. (Time, four months)
- e. As part of the collection strategy, review the possibility of electronic transfer of regional information over existing telephone lines. Clearly fax communication is possible, hence moderate speed, error-checking file transfer is also possible. (Time, one month)
- f. Review the current procedures for handling personnel actions, for handling procurements for central stores, and for reporting of financial transactions. Based on this assessment and part a. above, develop a priority implementation strategy. Given present activities, it is likely that Personnel actions including status,

numbers, qualifications, and location will be a high priority for transactional automation. Such personnel activities should include automation at the regional level. (Time, one month)

- g. Coordinate the automation of personnel functions, and if possible stores activities with responsible ministries. If another ministry has included automation as a priority, MOEC should become a member of the specifications committee and seek, as the largest single Ministry in terms of personnel, to influence the features and capabilities of any new enhancement. (Time, one year and continuing)
- h. At the end of the first year, review all progress on items a. to g. above. The review should include representatives from all major users--principals, circuit inspectors, regional staff, and other ministries. Critical to this review should be the perception of users as to the actual usefulness of the work undertaken and the changes that have occurred as a result of these efforts. (Time, two weeks)

Including the provision of expatriate assistance and approximately R 528,000 in equipment, this Phase I activity should cost approximately R 2.9 million.

## N E X T S T E P S

The following next steps should be undertaken immediately.

1. Review this report for factual accuracy.
2. Complete negotiations for additional contractual assistance based in part on the scope of activity presented here.
3. Begin drafting the revised planning questionnaire to be distributed in mid-year.
4. Establish appropriate Namibian counter-part staffing levels per the contractual agreement in 2.
5. Complete the EMIS plan with timelines and persons responsible.
6. Begin necessary procurement actions to obtain computer hardware and software in support of the EMIS.

**APPENDICES**

**APPENDIX A**  
**PERSONS INTERVIEWED**

**PERSONS INTERVIEWED**

<b>WINDHOEK</b>			
✓ Minister N. Angula	Minister	Ministry of Education and Culture (MOEC)	MOEC
Minister B. Wentworth	Deputy Minister		
✓ J. Lambert	Special Advisor		MOEC (221920-3183)
J. Visser	Deputy Permanent Secretary		MOEC
L. Burger	Deputy Director, Formal Education		MOEC (221920-3040)
J. Brand	Undersecretary, Regional Education		MOEC
✓ D. Chamberlain	Special Advisor		MOEC
G. Elliot	Auxiliary Services Officer		MOEC (36820)
L. Kruger	Logistics Officer		MOEC
W. Greef	Deputy Director, Administration		MOEC (36820)
K. Van der Merwe	Curriculum Advisor	National Institute for Educational Development (NIED)	
R. Trewby	Language Advisor	Windhoek Teachers College	
W.W. Nel	Professor	Academy	
R. Aula	Professor	Windhoek DH	
Mrs. Haythornthwaite	Headmistress	Ministry of Labour & Manpower	
N. Kaukungwa	Officer		
O. Voights	Planning Officer		MOEC, Planning
S. Riekert	Programmer		MOEC, Planning
W. Marais	Programmer		MOEC, Planning
<b>OVAMBO REGION</b>			
D. Nandi	Regional Director	Ondangwa	
A. Amushila	Teacher Training	Ongwadiwa Training (540)	Teacher College
G.K.K. Tshiguuo	Planning Officer	Ondangwa	
J. Kashupi	Principal	Oshakati School	Secondary
Teachers	Teachers	Oshakati School	Secondary
B. Prinz Shiimi	Employer	Ondangwa	(191 or 202)
<b>KAVANGO REGION</b>			
M. Kandjimi	Regional Director	Rundu	

✓ G. van Zyl	Inspector	Rundu
✓ T. Tweya	Teacher/Head	Maria Mwengere Secondary School (1141)/(Windhoek-- (O)62247/(H)221817)
--	Principal	Maria Mwengere Secondary School
--	Acting Principal	Rundu Secondary School
--	Principal	Sarasungu Primary School
--	Principal	Rundu Primary School
--	Principal	Rundu Combined Secondary School (formerly White Administration School)
--	Principal	Rundu Technical Training Institute
<b>KEETMANSHOOP REGION</b>		
J. van Lill	Regional Director	Keetmanshoop
<b>REHOBOTH REGION</b>		
W.W. Nel	Teacher	Rehoboth
<b>KATIMA MULILO REGION</b>		
J.M. Mukendwa	Regional Director	Katima Mulilo
<b>KHORIXAS REGION</b>		
W. Rencs	Principal	Swakopmund
<b>DONORS</b>		
J. Baskey	Acting Director	Peace Corps ((O)226525/(H)52013)
✓ F. Dahl	Representative	UNICEF, New York
M. Kamau	Representative	UNICEF, Windhoek
P. Obanya	Representative	UNESCO
✓ C. Noorgaard	Representative	WUS-Denmark/NGO
✓ L. Dahlstrom	Representative	ITTP
✓ R. Shortlidge	Mission Director	USAID
C. Aanenson	HRDO	USAID

**APPENDIX B**  
**USAID INDICATORS -- PROGRAM FUNDING**

## USAID INDICATORS -- PROGRAM FUNDING

### OBJECTIVES:

1. 80 percent primary completion for those who complete the 1st Year of the cycle;
2. 20 percent reduction in the average number of years to complete primary cycle (11 years to 8.8 years);
3. 15 percent reduction in the primary cycle cost (R13.2 thousand to R10.6 thousand);
4. 60 percent of students in each region are in schools that meet fundamental quality level (FQL) standards;
5. overall cost efficiency will improve by 30 percent.

### REQUIRED INFORMATION:

1. promotion rate 2-3, 3-4, 4-5, 5-6, and 6-7.
2. the number of years required to complete the cycle;  
the enrollment in each grade level in the cycle.
3. the sum of enrollments in each grade level;  
the average unit cost.
4. To be determined--inputs and outcomes.
5. graduates from the system;  
years to graduate;  
cycle costs;  
achievement level of graduates.

### REQUIRED IMPACT INDICATORS:

1. A. Improving Quality of Basic Education:
  - educational achievement, by region;
  - student and teacher attendance rate, by region;
  - promotion rates by grade level, by region;
  - primary cycle completion rates by region.
2. B. Increasing Quality and Supply of B.E. Textbooks and Material
  - quantity of textbooks per student, by region;
  - quantity of new textbooks and materials from donations by subject type, grade level, and country;
  - quantity of above by region;
  - quantity of above in use by students of region.

3. C. Establish Rational and Equitable Financial Resource Base
  - education expenditures as % of recurrent GON budget;
  - basic education expenditures as % of total recurrent education budget;
  - recurrent basic education expenditures by category--teacher salaries, materials, etc.;
  - resource mobilization by region and source;
  - additional costs of reform by category;
  - FQL schools by region;
  - expenditure per school by FQL category;
  - students enrolled in FQL school, by gender and region.
  
4. D. Enhance the Capacity of Institutions and Basic Education Professionals to Plan and Manage
  - administrators, teachers, support staff by specialty, civil service grade, and region;
  - students by grade and school or district;
  - students as a percent of school age population (GER);
  - teachers by civil service grade and by grade level, training, and specialization.

**APPENDIX C**  
**EMIS MEETING NOTES**

27

**Educational Management Information System  
Meeting April 18, 1991**

**I. Introduction**

- o Recent Visits
  - Ondangwa
  - Rundu
  - Other
- o Tasks

**II. Possibilities**

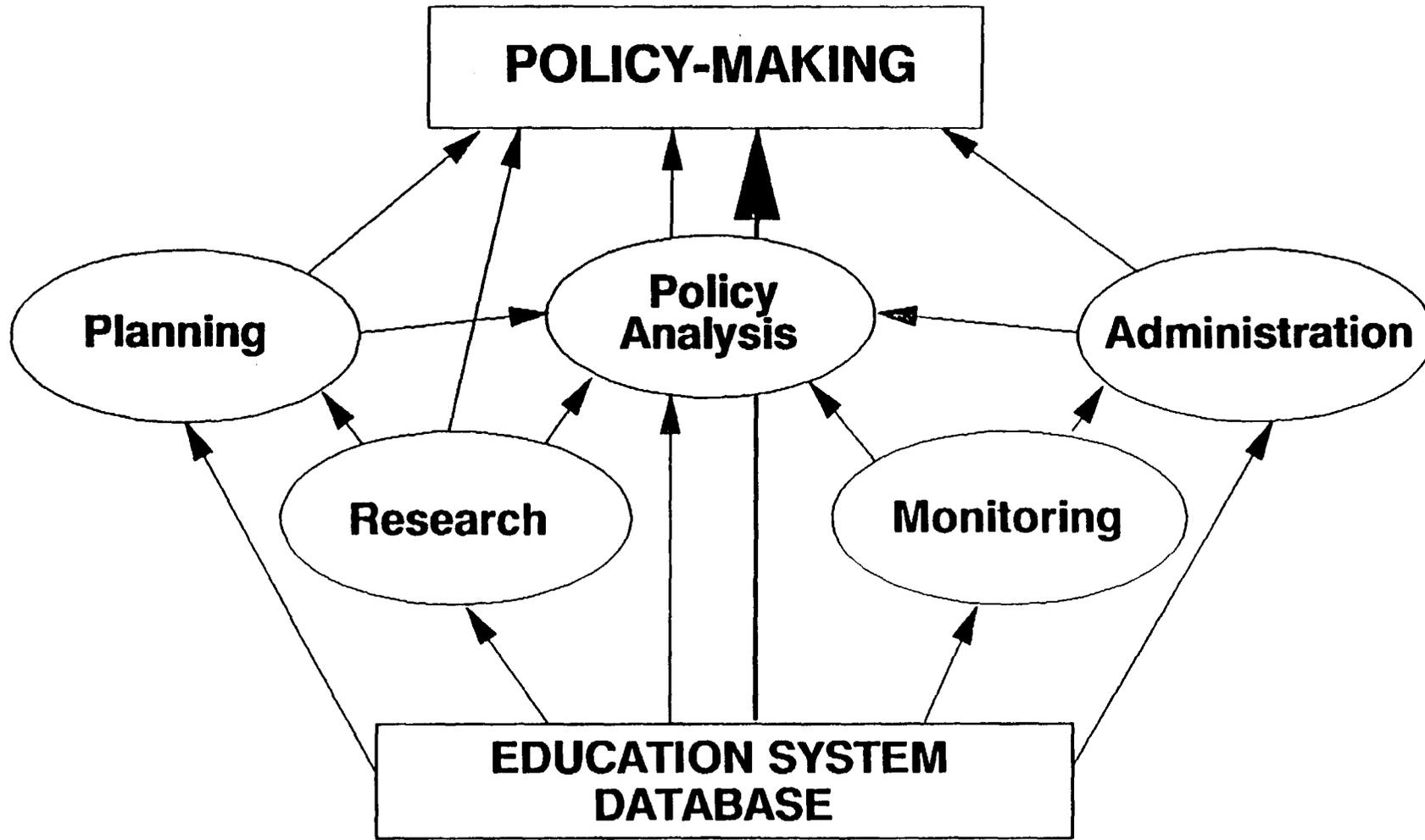
- o Light EMIS
  - Planning Oriented
  - Region, Head Office
- o Medium EMIS
  - Planning plus Transactional
  - Regions, Head Office, and some schools
- o Heavy EMIS
  - Built from Transactional Systems
  - School, Region, Head Office

**III. Immediate Steps**

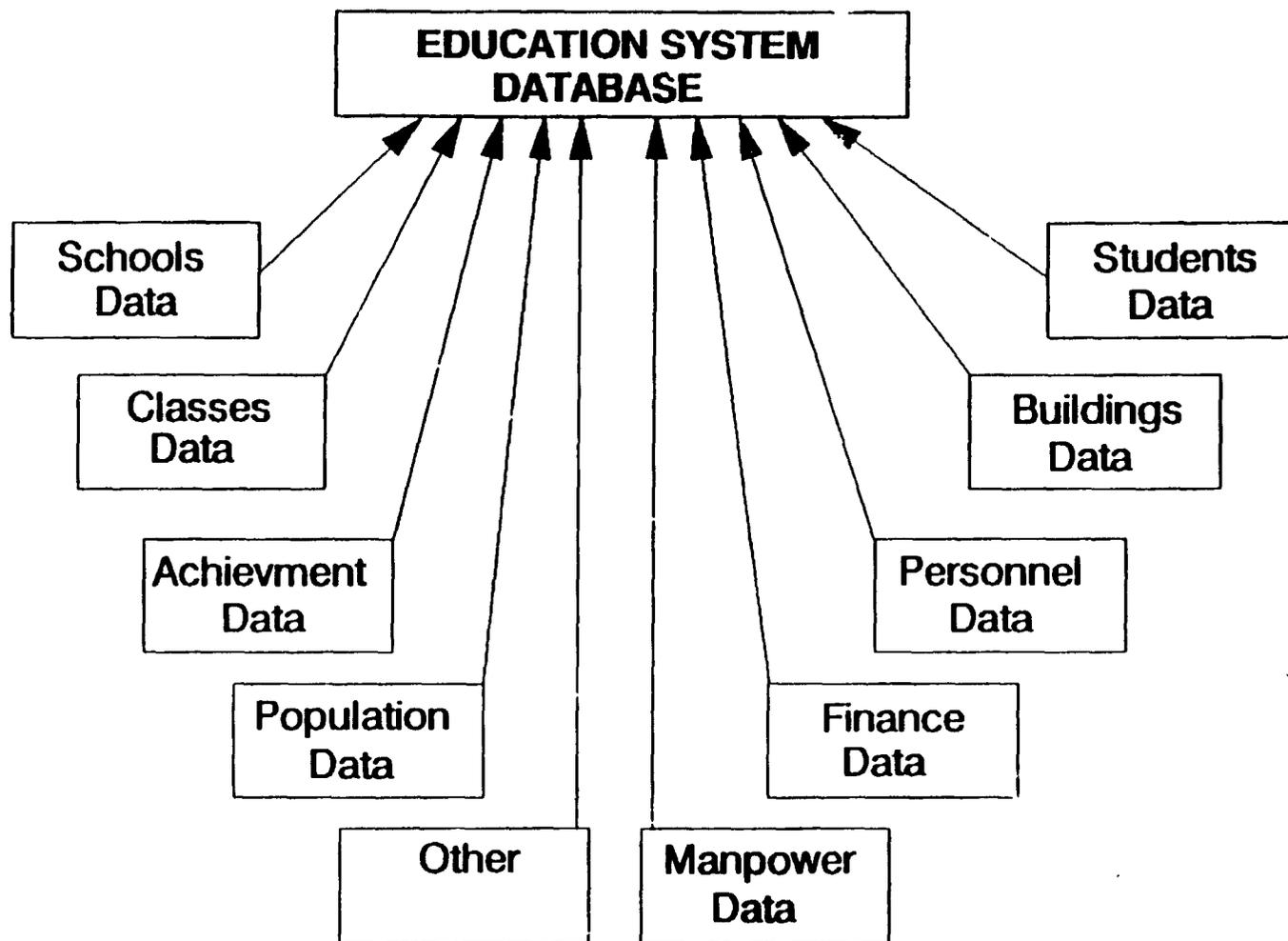
- o Intensive financially oriented modelling workshop
- o Revise 10th Day Report Substantially
- o Develop full MIS DataBase
- o Regionalize Efforts
- o Automate Personnel Actions
- o Coordinate development, either through MOEC or other Ministries of other systems
- o Revise Plan

**IV. Linkages with Regions**

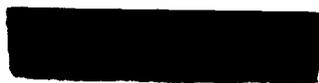
- o Instructional Development
- o Training
- o Effectiveness Indicators

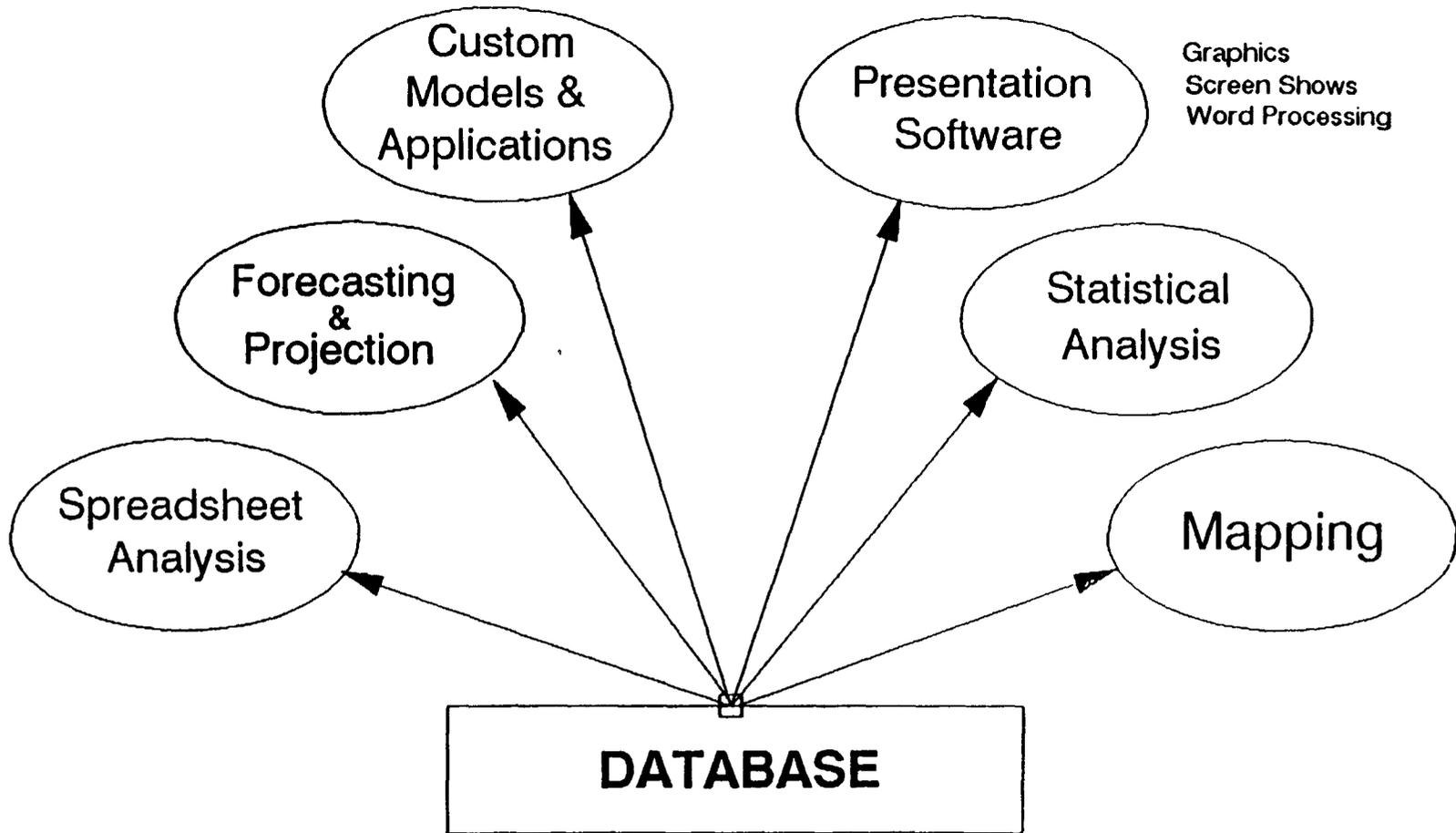


***THE EMIS DATABASE IN THE POLICY-MAKING ENVIRONMENT***

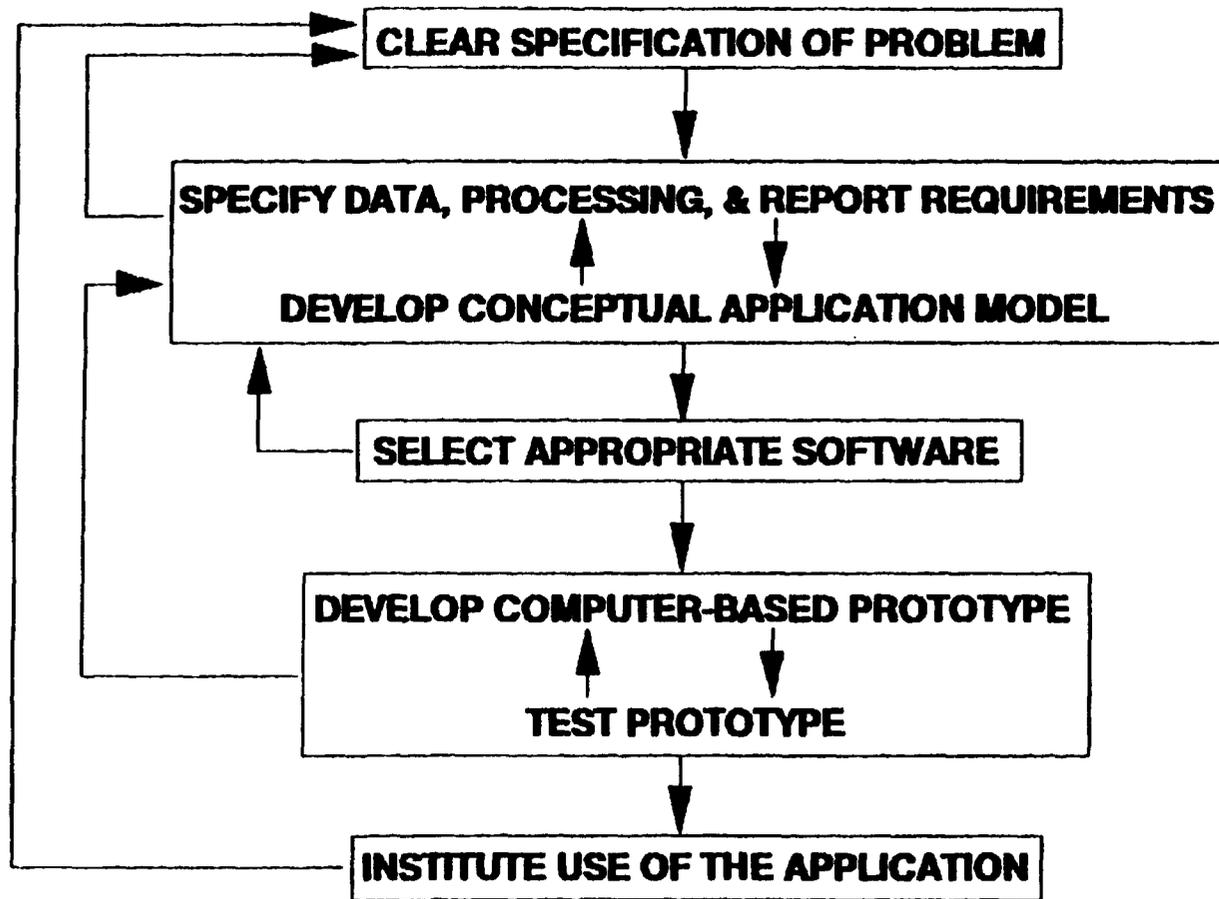


***EMIS DATA ELEMENTS***





***The EMIS Software Environment***



***THE PROTOTYPING APPROACH TO APPLICATION DEVELOPMENT***

**APPENDIX D**  
**SAMPLE AVAILABLE INFORMATION**

DEPARTMENT OF EDUCATION AND CULTURE  
 STATISTICS: 29 JANUARY 1991  
 CIRCUIT 1 TO 12  
 REGION 3

GRADES

E  
 NO  
 34  
 40  
 44  
 43  
 45  
 37  
 65  
 20  
 87  
 27  
 31  
 48  
 571

CIRCUIT	GRADES												LEVEL		PRE-PRIMARY	BRIDGE YEAR	AFTER CARE	TOTAL	POSTS FIELD	VACANCIES	SURPLUS		
	1	2	3	4	5	6	7	8	9	10	11	12	N 1	N 2								1	2
1	3 455	2 047	1 723	1 667	1 494	1 353	1 125	891	953	784	187	-	-						15 679	363	34	4	
2	3 619	2 097	1 732	1 718	1 481	1 445	991	1 122	1 038	437	53	20							15 753	407	58	13	
3	4 265	2 923	2 263	2 379	2 332	1 942	1 959	1 644	1 781	1 841	150	145							23 424	616	111	35	
4	2 462	1 699	1 423	1 507	1 541	1 279	1 155	894	802	310									12 872	350	32	11	
5	7 047	3 338	2 386	2 185	2 045	1 926	1 517	974	902	309									22 609	471	180		
6	4 230	2 592	1 925	1 991	1 603	1 551	1 205	960	408	93	487	329	98	49	345	514	61	30	23	18 492	485	99	18
7	7 289	3 554	2 307	2 236	1 657	1 372	1 162	621	529	287	70								21 084	401	204	4	
8	7 830	5 712	4 222	4 111	3 266	3 103	2 601	2 321	1 811	802	288	69							36 114	796	263	14	
9	9 558	5 120	3 675	3 254	2 788	2 255	1 830	1 474	1 264	690	93								32 001	751	215	32	
10	2 704	1 071	895	767	615	503	383	417	323	379	140								8 197	189	45	2	
11	2 305	1 401	1 120	1 419	961	847	609	298	446	275									9 681	267	35	16	
12	5 408	2 872	1 920	1 789	1 409	1 085	959	730	579	351	33	10							17 145	381	130	13	
TOTAL	60 172	34 428	28 571	25 023	21 192	18 661	15 488	12 388	10 638	6 398	1 458	573	98	49	345	514	61	30	23	233 051	5 477	1 486	158

IAKATI 2  
 ULE 2  
 WGA 1

5 on ELIST. / ALL SECONDARY

many 3

3 on ELIST. - Lighting & testing

Incr. = 10-12%  
 FR = 20 sch./inc.

DEPARTMENT OF EDUCATION, CULTURE, YOUTH AND SPORT

REGION 2 (KAVANGO)

STATISTICAL DATA AS ON 29 JANUARY 1991

Inspection circuit	Inspector	Pupil enrolment																										
		Pre Primary			Grade 1			Grade 2			Grade 3			Grade 4			Grade 5			Grade 6			Grade 7			Totals		
		B	G	T	B	G	T	B	G	T	B	G	T	B	G	T	B	G	T	B	G	T	B	G	T	B	G	T
1. Central A	R. Kandjini	224	237	461	1313	1368	2681	835	953	1788	650	645	1295	525	546	1071	409	428	837	394	400	794	66	53	119	4418	4630	9046
2. Central B	J. Haingura	236	230	466	1026	1180	2206	880	688	1368	552	604	1156	431	519	950	336	365	701	338	320	658	160	135	295	375	404	780
3. East A	A. Mashika	24	34	58	529	567	1096	380	381	761	293	236	529	213	218	431	178	151	329	245	175	420	78	40	118	1940	1802	3742
4. East B	K.P. Shiyaka	14	23	37	527	523	1050	327	321	648	298	316	614	214	211	425	190	170	360	172	150	322	63	53	116	1805	1767	3572
5. East C	I. Mokorabi	18	18	36	635	548	1183	333	355	688	221	207	428	227	189	416	138	132	270	145	150	295	121	81	202	1838	1680	3518
6. West A	I. Shikukwa	33	31	64	625	689	1314	391	335	726	286	233	519	188	194	382	109	90	199	71	65	136	35	40	75	1738	1677	3415
7. West B	G. Mashipara	53	62	115	741	663	1404	355	370	725	273	326	599	275	301	576	300	312	612	251	335	586	167	150	317	2415	2519	4934
8. Bagani	J.C.H. van Zyl	22	22	44	47	45	92	14	10	24	13	15	28	25	13	38	13	5	18							134	110	244
TOTALS		624	657	1281	5443	5583	11026	3315	3413	6728	2586	2582	5168	2098	2191	4289	1673	1653	3326	1616	1595	3211	690	552	1242	18045	18226	36271

SECONDARY SCHOOL INROLMENT 1991

GRADE	Kandjini Mirangi Mirangi School			Max Makushe School			Dr. Komarus Kampungu School			Rundu Secondary School			Linus Shashipapo School			Leevi Hakusembe School			Maria Mwengere School			TOTAL		
	B	G	T	B	G	T	B	G	T	B	G	T	B	G	T	B	G	T	B	G	T	B	G	T
7	7	12	19	70	46	116	61	58	119	85	68	153	42	40	82	50	41	91	46	30	76	361	295	656
8	142	134	276	136	88	224	106	90	196	124	88	212	128	93	221	138	96	234	121	70	191	895	659	1554
9	174	101	275	171	49	220	106	96	202	91	58	149	113	63	176	102	60	162	73	19	82	830	446	1276
10	53	30	83	56	27	83	81	78	159	176	104	280	41	16	57	99	47	146	66	32	98	572	334	906
11	12	3	15				30	19	49	68	19	87	14	0	14	15	4	19	54	8	62	193	53	246
12							18	6	24	27	8	35							21	6	27	66	20	86
TOTAL	388	280	668	433	210	643	402	347	749	571	345	916	338	212	550	404	248	652	381	165	546	2917	1807	4724

$$\text{Total} = 3627 + 4724 = \underline{\underline{40995}}$$

GRADES: 7-10 (2)  
7-12 (2)  
7-11 (1)