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Making the transition to the electronic age: managing electronic and paper records as a strategic resource for good government in developing countries

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Abstract. Wherever computers are used to carry out a function, records are being generated either electronically or as hardcopy output. Records are a subset of the wider information universe. Their unique quality is that they are the sources of information that provide the evidence base for accountability. This makes the maintenance of good record keeping systems of particular significance to public sector reform. Computers are rapidly being introduced in every area of public administration to enhance control of key resources, notably finance and personnel, and to improve efficiency. National and donor governments alike have come to view computers as the solution to the management of the information required to deliver effective public services.

If public sector reform is to be a reality, this thinking needs to be modified. Too often, managers regard technology as a panacea for the shortcomings of the existing record systems, procedures and communications infrastructure. Of course, computerised systems offer significant advantages over conventional manual methods because they can manipulate information with great speed and precision, but they have limitations. Computers make excellent information systems because that was the original purpose of many computer applications, but they are much less suited to be record keeping systems. Data on a computer can easily become corrupted for one reason or another. Not every country accepts computer generated data as evidence in a court of law, but those that do, do so only on strict conditions. Part of the solution is to use paper as an integral component of the automated system. Information systems analysts must remind themselves that computerisation alone rarely solves problems.

1. Introduction

> The major factor contributing to gross inefficiencies and lack of continuity in policies, procedures and measures of many African states is not, as commonly proposed, frequent changes in governments, but bad management of records.
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> K.B. Asante, Secretary for Education, Ghana [1]

Records are a subset of the wider information universe. Their unique quality is that they are the sources of information that provide the evidence base for accountability. This makes the maintenance of good record keeping systems of particular significance to public sector reform. Sadly, public sector records keeping systems in many developing countries throughout the Commonwealth have broken down and some have collapsed. This situation has major consequences for the administration reform programmes now underway in dozens of developing countries throughout the world. The significance of the problem is only just beginning to be recognised.

As we approach the 21st century, two global trends have increasing significance for the way we manage public sector records. Firstly, since the 1980s many developing countries have introduced Structural Adjustment Programmes, often as part of 'conditionality' for loans from the Bretton Woods organisations. In many cases a major component of these Structural Adjustment Programmes is the reduction of civil service budgets by eliminating 'ghost workers' and cutting back on the overall size of the civil service [2][1]. Clearly, accurate personnel and payroll records are essential to do this. Secondly, computers are rapidly being introduced in every area of public administration to enhance control of key resources, notably finance and personnel, and to improve efficiency. National and donor governments alike have come to view computers as the solution to the management of the information required to deliver effective public services.

If public sector reform is to be a reality, this thinking needs to be modified. While it is essential that developing countries build up computer competency quickly, the failure to link the computerised record systems to paper-based systems is dangerous and needs to be addressed urgently.

2. Common difficulties with existing paper systems[2]

Almost nowhere in developing Commonwealth countries is the management of modern paper records being addressed adequately[3]. Problems with paper records systems are systemic rather than simply procedural. In the 1980s, a Luverhulme funded survey of 32 Commonwealth countries revealed that many parts of the developing Commonwealth had missed out on the 'records life-cycle' revolution in records management that had occurred after most of these countries achieved independence. The survey was carried out by Dr. Anne Thurston of the School of Library Archives and Information Studies at University College London between 1986 and 1988. The reports are unpublished. The National Archives responsible for managing government records were not equipped with the necessary legislation, strategies and techniques to manage systematically the enormous explosion in the volume of paper records generated[4]. In many countries ministries became overwhelmed with paper. Registries and file rooms ran out of storage space. Consequently they became untidy and it became progressively more difficult to locate and retrieve information.

The low status of records activities has prevented the problem receiving the attention it deserves. Records management is seen as a low grade service area and virtually no attention is given to the way information is created, structured and managed. In the ministries of many countries, files are simply opened in a running sequence, with no indexing systems and no means of tracking this movement.

[1]For example, the Government of Uganda has reduced the size of its Civil Service from 320,000 in 1991 to 148,000 in March 1996, according to Mr. M. Lagara, Commissioner Compensation and Pay Reform, Ministry of Public Service, Uganda. The difficulties in obtaining basic information needed to implement this retrenchment programme were the justification for the development of the Central Personnel Management Information System (CPMIS), see KPMG Management Consulting 'Government of Uganda: Personnel Information and Management Control', KPMGref:p/sbmstaff/js/mr/Uganda2.rep, November 1993. See also [2].

[2]This paper draws upon the years of experience of the International Records Management Trust in carrying out work all over the world, and in particular in carrying out projects in Africa. Individual governments are not named where it might cause embarrassment.

[3]There are exceptions which prove the rule. Examples include Ghana, Gambia and Uganda where much progress has been made.

[4]For example, in Uganda it is illegal to destroy any government record. A new National Records Act is in the final stages of preparation which will rectify this situation.

A letter arrives, is seen by a senior official and then disappears; no one knows where it is filed. The result is that governments lack the information they need to plan and implement policy on an ad hoc basis and are unable to monitor the results of their policies.

The problems often associated with personnel records will be used to exemplify the issues because personnel information is often one of the first categories of information to be computerised. Also it is crucial for civil service reform and for controlling the size of the civil service. Nevertheless, the problems described are in many cases typical of those found with other types of public sector record. These difficulties help to explain why computerisation is such an appealing notion for managers.

Too often, paper files are in disarray. Storage rooms are overcrowded and disorganised, there is often little security, and they are often damp and badly ventilated, which encourages the spread of mould and rot. Sometimes procedures are inadequate. The registry has no means of finding who has a file at any particular point because file tracking systems are often deficient. Files cannot be retrieved without a major search being launched. The result is that large amount of staff time is wasted.

Even when the relevant files can be located there may be problems. First, when a master set of files officially exists, there is a tendency for duplicate files to proliferate. Sometimes the cause is an unnecessarily complex and centralised administrative system. In one African country, each appointment or promotion in the civil service generates no fewer than 14 pieces of paper. These documents are filed in three places: with the department, the office of the head of civil service, and the civil service commission. In another case study in a different country it was found that the Ministry of Education has three sets of almost identical service files of teachers: at headquarters, province and district levels. At each level there are two files. There is an open file containing forms and correspondence that may be seen by the teachers. Secondly, there is a confidential file that contains assessments of performance and other information that may not be seen by the teachers. At each level these files are held in open and closed registries, respectively. In addition, personnel files are kept at the school, but these do not contain complete information. Finally, there is a separate finance file for each teacher at headquarters. Thus each teacher generates no fewer than eight personnel files held in different locations.

The decision making process is similarly convoluted and demonstrates the time-consuming and costly nature of this highly centralised process. For example, appointments and promotions have to pass up and down four links of the chain of command. In most cases, when recommendations are passed from one authority to the next they are accompanied by a typed letter, and in some cases by the file itself. This wasteful process greatly adds to the records management workload and to the costs with no benefit to the decision making process. Often there is another consequence. The proliferation of files encourages the filing of multiple copies in different parts of the system, yet the nature of the system makes it difficult to ensure that there is a master file that contains a complete set of records. The problem is compounded where staff move from one department to another. The consequence is a proliferation of files on the same person scattered through many filing systems, but no one place where all the information is located. Obviously this has a serious impact on records management. Huge amounts of expensive office space are occupied needlessly by duplicate records and much time is wasted attempting to obtain information spread over many locations. Moreover, the situation can be particularly annoying to individuals on retirement when they need to establish proof of their service record to claim their pensions; in fact delays have on occasion led to actual hardship.

The situation described above was perpetuated by the fact that no one had responsibility for ensuring that the entire information system was practical and that it matched current realities and requirements. The system should be systematically analysed as a whole and restructured to ensure that the information system matches the information needs of the users. Clearly the key is to simplify the process and

reduce the number of copies that need to be created and sent. Although this will require a substantial effort the result may be justified in terms of increased speed and efficiency. This would be beneficial whether or not it is decided to automate part or all of a business process.

Another major problem for personnel managers is that it is often very difficult to compile an accurate list of everyone who works for a department by using the official records. This is largely because whole categories of government employees may not have individual personnel files. For example, unqualified teachers, non-establishment workers, or establishment staff who were promoted out of non-establishment posts may be categories for which personnel files are not created and kept. This is a situation that makes it relatively easy for inaccuracies to creep on to the payroll records – the 'ghost worker' problem – because it is so hard to compile an authoritative master list of personnel.

The direct cost to the government's budget of salaries fraudulently claimed is often substantial. For examples, in Uganda, a report on the successful Civil Service retrenchment programme concluded that wages and salaries accounted for 22% of government expenditure. In each year since 1990, between 5% and 9% of the payroll were identified as ghost workers. It was concluded that if the ghost worker problem was allowed to return to levels experienced in the early 1990s 'then approximately 1.5% of current recurrent expenditure of Ushs[5] 350 billion, i.e., Ushs 5.25 billion, would be at risk' [4]. Also, there is a cost in terms of the inability to carry out human resource planning because the reliable statistics of how many staff exist on each particular grade are not available.

Solutions to these problems exist. There is a need for orderly, well equipped and well-organised registries so that papers are filed consistently and can easily be found. The key is to have a file tracking procedure that works reliably so that a file can be found quickly even if the registry has lent it to an officer. Staff have to be confident that if they send a piece of correspondence to the registry for filing they can get it back again quickly. Registries should be cleared of personnel files of people who have died, retired or left the service. It is essential that the Payroll and Pension Departments regularly pass on to the registries, lists of staff whose records can be destroyed according to the instructions of an officially approved retention schedule. Finally, there must be clear rules about what documents must be filed on the master personnel file and these rules must be strictly enforced. This allows the destruction of duplicate files in 'satellite' record systems, for example, in regional branches, when it becomes operationally convenient, secure in the knowledge that a master set exists at headquarters. Much can be achieved by means of traditional low technology equipment combined with good organisation.

Senior managers have much to contribute by creating the framework which will permit these measures to be implemented. They can ensure that record keeping procedures are regularly reviewed for efficiency and relevance. They can raise the status and morale of registry staff, make appropriate resources available and integrate record keeping operations with the core functions of government. Governments run on information. Records, the main source of information for government, have to be regarded as a vital resource.

3. The reality of automation

> The first rule of any technology used in a business is that automation applied to an efficient operation will magnify that efficiency. The second is that automation applied to an inefficient operation will magnify the inefficiency.
>
> Bill Gates [4]

[5]Ugandan Shillings.

Too often, managers regard technology as a panacea for the shortcomings of the existing record systems, procedures and communications infrastructure. This applies as much to older technologies such as microfilming as it does to computers, whether networked or stand-alone.

Microfilm enjoyed a vogue in large corporations about 20 years ago. It has two useful features: microfilms can be easily and cheaply copied and they take up very little space. On the other hand, experience has led to a consensus in the records management profession that microfilm is appropriate only in particular circumstances. Microfilming has important disadvantages. It is very labour intensive and expensive to carry out microfilming to a consistently high quality. Users do not like consulting microfilmed records, and complain of headaches from viewing poor quality images. Also, unless the microfilm system is supported by computerised retrieval systems, information retrieval is laborious. Unless the original records are well organised and in good condition, the successful retrieval of information is haphazard at best. Microfilm is most suitable either for bulky, well organised, high volume records that are very seldom retrieved, where space is at a premium, or where access needs to be decentralised.

Computerised systems offer significant advantages over conventional manual methods because they can manipulate information with great speed and precision. For example, they permit the collection and aggregation of statistical information which would be very time consuming, if not impossible, to assemble from manual systems. If a network is used computers are a powerful tool for sharing information within an organisation and for working in groups. We should remember that they also have limitations.

First, they do not think or organise, they simply process very simple routine actions very quickly. This is obvious, but its consequence is often disregarded in the enthusiasm to take advantage of the new technologies. Like microfilm, computers will not clean up a mess that exists already. They will simply process that mess much faster. If the existing procedures are muddled, if there is incomplete data, if the personnel information does not match the payroll information, a computerised system will not untangle the confusion. Putting the existing system in order has to come first. If the existing paper based information is incomplete and unstructured, then the data has to be reconciled, verified and organised before it goes on the computer. In many cases implementing a record management programme to improve the existing paper records is a cheap and cost effective way of preparing for successful computerisation.

Secondly computers will not work without electricity. In countries where electricity is not available for several hours a day, or where the current fluctuates, it is risky to rely entirely upon automated systems as the main source of information for the civil service. In these circumstances, it is important to have procedures in place that allow efficient manual operations should the power supply be interrupted.

Thirdly, computer systems will not run without paper; at least not for the present. When we talk about computerised systems in reality we mean a computer-plus-paper system. Even in the most developed countries most of the information in an organisation is to be found on paper and not in electronic form. In 1989, 95% of all information in the USA was in paper medium. By 1999, it is projected to be about 92%, a significant decrease, but still very much weighted towards paper records [5]. Moreover, in absolute terms the growth in the volume of paper in filing systems is growing not falling, even in the USA[6]. Statistics confirm what we have all observed in our daily

[6]Based upon quantity of raw paper stock used in manufacturing file folders 1979–1992. Source: American Forest and Paper Association.

working lives, namely, computers together with photocopiers have led to a massive increase in use of paper. We have more paper to organise and manage, not less. The widely held notion that computers will do away with the need for paper records is a fallacy. Again, this points to the importance of having a records management programme to manage the huge influx of paper that comes with office automation.

Computers not only create more paper documents, they actually require them to operate efficiently. This is not a notion widely promoted by the heads of computer departments or computer suppliers, but in practice paper records are an essential component in any computer system. Obviously, a complete set of paper manuals is required to operate and maintain the system, but it goes far beyond this. In many cases the records generated by computer systems do not reside in electronic form, but as paper print outs. This is because computers are very good tools for manipulating information, but they are much less reliable as a means of keeping records.

4. Reliability of electronic and paper based records

Computers do not produce records as reliable as traditional paper systems. This is partly because of the nature of the technology and partly because of the way the technology has been used when designing systems. This has a bearing on the objectives of public sector reform: legitimacy, accountability, competency, respect for human rights and the rule of law. The facility of computers in manipulating and processing information has obvious advantages for improving competency but these very characteristics create a problem of evidence that can detract from the objective of accountability.

Computers make excellent information systems because that was the original purpose of many computer applications, but they are much less suited to be record keeping systems. What is the difference between an information system and a record keeping system? Information systems contain timely, manipulable, non-redundant data, whereas record keeping systems contain time-bound, inviolable, redundant data [5]. Data on an information system is the latest information. Data on record keeping systems may be weeks, months, or even years old. Information systems allow the information to be manipulated and changed, whereas data in a record keeping system must be inviolable. If it is possible to change the figures of a financial statement or the text of a policy recommendation after the event, then clearly it cannot be a reliable record. Finally, information systems do not contain redundant data. When the data is superseded by more recent information, it is automatically deleted and replaced by the latest data. In contrast, record keeping systems keep large quantities of redundant data. Record keeping systems contain the institutional memory, information systems do not. It is a point that cuts right to the heart of civil service reform: accountability. Without good records civil servants are not accountable to their political masters, and subordinates are not accountable to their managers. Moreover, the government is vulnerable to unsubstantiated claims.

It is one of the paradoxes of databases that for 90% (or even more) of the time they are in operation, the data on the database is not completely reliable. The reason is that the constant updating of the data leads to errors. Also the fact that there are usually many different data contributors means that it is difficult for any individual to control all the data on the system. Usually databases used for a particular function such as payroll have an in-built check, in the sense that once a month or once every two weeks the database is used to pay staff. The staff are naturally very keen critics of the accuracy of the data. If anyone is underpaid, the system administrator will hear about it very quickly. Databases

used for business functions, where there is no specific time when there data is required to be accurate (for instance, the monthly running of payroll cheques) tend to accumulate errors. For example, the student registration database used by the University of London in the 1980s is a case in point. It was only when the government required that it received accurate reports on a certain date every year that the extent of inaccuracy in the data was revealed. It was the external government demand that the registry data be accurate that compelled the university authorities to rectify the situation. It was a long and painful process taking several years. The lesson is clear, databases will tend to be inaccurate records unless there is a regular and rigorous audit by a higher authority.

Data on a computer can easily become corrupted for one reason or another. This is why system backups are so important. If the data becomes corrupted, it is possible to reload an earlier instance of that data from a backup. Nonetheless, there remain two problems even when an uncorrupted backup exists. First, the information is no longer a complete record of all the transactions; we only have the old data up until the time the backup was made. A lawyer could argue that the information is unreliable and so cannot be trusted as a record. Second, unless one is able to document precisely what data was entered on to the system, and what changes were made to existing data between the last backup and the discovery that the data has become corrupted, it will be impossible to rectify the deficiency. It will be impossible to entirely trust that information as a record of what happened ever again. This can represent a very serious financial loss. The cost of inputting the data, sorting out what data is corrupted and what is correct may work out to be several times the capital cost of the software and the hardware.

Part of the solution is to use paper as an integral component of the automated system. One can arrange for the regular printing out of the contents of the database on to paper or microfilm in a structured format. This print out can include a printed date and time when the report was run on the computer system, so that one can fix precisely the state of the data at an exact moment. This is a reliable and authentic record. Second, one can create and keep data input forms which record what data was entered on the system. These must record what date the information was keyed into the computer. In this way it is possible to know what data was input in between the last uncorrupted backup and the discovery of data corruption. The paper trail should show what ought to have been entered on the computer as well as what actually was on the system at a precise time and date. It is the main safeguard that the data is authentic and reliable. The paper records need to be arranged in a way that is useful if they need to be consulted. Their treatment needs to be tied to the backup cycle of the computer system. For reasons of accountability, the paper filing system should be the ultimate authority.

Finally, not every country accepts computer generated data as evidence in a court of law, but those that do, do so only on strict conditions. In most cases, there is a requirement that the organisation demonstrate that the computer system has consistently applied appropriate procedures to ensure the authenticity of the record[7]. This means keeping records not only of the procedures themselves, but also records to show that the procedures have been regularly applied. Obviously, whether electronic records are admissible in a country's courts of law will have a major impact on the degree to which one can rely on electronic records for accountability.

[7]In the United Kingdom the British Standards Institute has launched a new code of practice: *The Legal Admissibility of Information Stored on Electronic Document Management Systems* (PD 0008). The code of practice is not as authoritative as a full-fledged British Standard and does not guarantee that an electronic document will be accepted in a British court, but is an important first step. The code of practice defines procedures and processes which should be used throughout the lifetime of the electronic document, which demonstrate, in a Court of Law, that a copy document created from the document management system is a true (authenticated) copy of the original document.

5. Conclusion

Efficient records systems are an essential component in the implementation of Structural Adjustment Programmes; the development community and the IT community are beginning to recognise this.

Wherever computers are used to carry out a function, records are being generated either electronically or as hardcopy output. Records are the primary source of evidence of how the functions of public administration are being carried out. Thus records are the building blocks of accountability. Computer generated records are qualitatively different from traditional paper records. They are more vulnerable. They are harder to authenticate and their legal status can be problematic. Much more thought needs to be given to the implications of computerisation, the areas that would be most beneficially automated and the linkages between paper and electronic records. Not only are many developing countries ill equipped to sustain automated systems, but the fact that their paper based systems are often collapsed and chaotic, means that there is no sound information base on which to build. Donor agencies' consultants attempt to work around the problem by ignoring the paper based systems and building new computer systems. This attempt to transfer a technical strategy direct from developed societies without real consideration of the circumstances on the ground has serious consequences. Because no significant research is being carried out on the means of establishing linkages between paper and electronic records systems, there will increasingly be situations where neither system is complete. The failure of donor governments and development planners to address this situation has serious consequences for the process of development planning and the move towards good government, democracy and transparency.

What can be done now? Policy makers have a role in this process in facilitating a closer and better focused co-operation between information technologists and records managers. Second, the legal status of electronic records needs to be resolved. Without certainty in this area the potential of new technology cannot be exploited to its fullest extent. Where there are problems with power supply, access to spare parts, etc., a decision has to be taken over how far essential government functions may be computerised. Guidelines are required for deciding which functions are essential and what minimum level of alternative manual operation is acceptable in an emergency. Office automation offers enormous opportunities for efficiency gains, but it also poses problems for accountability unless steps are taken to ensure that authentic, reliable records are created. This will require leadership at a senior level to ensure institutional requirements for accountability are met, by determining which databases maintained as records and setting target dates when the data must be accurate. There have to be regular audits to verify that the data is accurate.

If these problems are to be resolved it is essential that governments and donor agencies place as much emphasis on paper records as they do on computer records and that they find means of building links between the two systems. Since the analytical process which lies at the base of the electronic and paper systems is the same, the two must be developed in such a way that they are mutually reinforcing. Records managers and archivists should have a role in ensuring that the office systems of the future do indeed produce good records as they bring a unique perspective and expertise to the issues.

Finally, information systems analysts must remind themselves that computerisation alone rarely solves problems. There needs to be a multi-disciplinary approach encompassing not merely computerisation, but also data management, process redesign, design of effective filing systems and record management. Managers need to take a broader view of the issues and be more realistic about the relative importance of 'pure IT' component in the total package.

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