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# INFORMATION, INFORMATION MANAGEMENT AND GOVERNANCE

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## Abstract

This paper makes the link between information, its management and governance. It explores the literature in an attempt to gain an appreciation of what constitutes governance and extracts from that search a number of views. The paper is built in part around those views that in fact converge. Governance needs to be informed continually by information flows that are examined, digested and evaluated against the intended direction of government policy. The mechanics of establishing an effective information system are discussed against the background of an existing system that is unequal to the contemporary demands for information to inform governance. The paper views appropriate and relevant data as a necessary input into the process of governance, but does not focus on that process. The importance of networking of both people and computer hardware is observed. The paper observes the importance of networking among people in the interest of the national good. The continued existence of islands of information is viewed as being undesirable because of the inherent duplication of effort, information and incomparability of data purporting to measure the same phenomenon. A recommended way forward is the 'horizontal approach' which advocates a re-design of the information architecture. It finds a measure of support in the recent data dissemination initiative of the International Monetary Fund (IMF) and the World Bank. The paper recognises the effort of the IMF and the World Bank to have countries document their methodologies and place quality delimiters on their data. This effort is applauded.



**Key words**: Information, information management, governance, policy, networking, horizontal, vertical, information architecture and dissemination.

# INFORMATION, INFORMATION MANAGEMENT AND GOVERNANCE

## Introduction

The importance of information has for many years been appreciated and argued by a relatively small group of professionals comprising statisticians and librarians or documentalists. Their forums included the participation of planners and other major users of data who could assist in changing the nature of data collection, processing and dissemination. From as early as 1989 the Subregional Headquarters for the Caribbean of the Economic Commission for Latin America and the Caribbean (ECLAC) has advocated the enunciation of an information policy in its member countries. Such a policy would include a statistical information policy that would prescribe the management of numerical data for the benefit of national economic and social development. Numerical data cannot be maximally useful without qualifiers of the numbers. The data require an information set that describes how the numbers were derived, assigns a quality rating to them and indicates the periodicity with which updates to the data may be expected.

This paper discusses the nexus between information, information management and governance. It focuses on issues relevant to the public sector and makes a case for its reform, especially in the area of information systems.

## Exploring the nature of 'governance' and the importance of information management to 'good governance'

While not proffering a direct definition of the term "governance", the Commission on Global Governance[1], an independent group of 28 public figures, expressed the view that the end of the Cold War offered opportunities to build a more co-operative, safer and fairer world. The Commission presented proposals for improving the world's governance and better managing its affairs in a report published in 1995. In 2000, the Commission facilitated the convening of a Millennium Assembly and Summit. Two major subjects were addressed. These were:

- Involving civil society; and
- Improving world economic management.

[1] The Commission was established in 1992 and directed its attention to the strengthening of Global Cooperation. A major force behind the formation of the Commission was Willy Brandt, former West German Chancellor. The Co-Chairs were Ingvar Carlsson, then Prime Minister of Sweden and Shridath Ramphal, former Secretary-General of the Commonwealth Secretariat.

It is likely that these topics emerged in the environmental scan and interviews were conducted by the team in preparation for the Millennium Assembly and Summit.

In an explanation of the concept of "Governance", Strassman (2000)[2] observes that:

> *"'Governance' is what information management is mostly all about. Information management is the process by which those who set policy guide those who follow policy. Governance concerns power, and applying an understanding of the distribution and sharing of power to the management of information technologies".*

Making the statement that sustainable development requires good governance, Secretary-General of the United Nations, Mr. Kofi Annan[3], proffers the view that

> *"Good governance entails a vast set of democratic processes and institutions at every level of society, from the local council to regional, national and international institutions, that allow the voices of the people to be heard, conflicting interests to be peacefully resolved, and a forging of consensus towards greater social progress."*

Speaking at the Olof Palme International Foundation's Seminar entitled "Governance at the End of the Millennium" at Barcelona, Spain, in February 1999, Sir Shridath Ramphal, former Secretary-General of the Commonwealth Secretariat, clarified that:

> *"When we talk of 'governance' and 'democracy', we have to look beyond governance within countries and democracy within states. We have to look to Global Governance and Democracy within the Global State".*

This paper looks at an aspect of governance within countries and democracy within States. In order to achieve the goals of global governance and democracy one must start at the elemental country, community within country and individual citizen level. It is at this level that we can move from abstraction to concrete problems and solutions that will affect governance where it matters most - at the national and local levels. Indeed, the approach to be adopted in this paper cites resonance in the discussions

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[2] Paul A. Strassman, Governance of Information Management: Principles and Concepts, ISBN071737310X. Strassman is adjunct Professor, School of Information Warfare, the National Defense University in Washington and Adjunct Professor, Systems Engineering, US Military Academy at West Point.

[3] Does Sustainable Development Require Good Governance?, UN CHRONICLE, 1998

in the World Summit on Social Development (Copenhagen, 1995) in which emphasis was placed by the Summit on the right of communities to participate as full partners in their own development. Duncan (1993)[4] emphasises that:

> *"Community participation should not be a privilege granted at the discretion of bureaucratic agencies, or arising out of the 'connections' and accidents of local leadership. It should be legally and constitutionally entrenched as a right of local communities. Whether in relation to local government or NGO participation in community development and poverty reduction, the legal and institutional framework should be transparent and formal."*

The public has the right to know about the data that have been collected, disseminated and maintained by the government so that it can evaluate government's performance. Whereas the process of knowing by the governed is not the focus of the paper, the need for a mechanism and a forum for informing the public and eliciting feedback "from the bottom" is clearly appreciated. Whereas the Internet is an excellent medium for providing wide access to government information, it must be supplemented by a dissemination modality that uses a lower technology level to cater for citizens who do not have easy access to computers. One such modality would comprise physical meetings with various interest groupings and sections of the community. These groups may present different views of the same data that should be of interest to all concerned.

The context of Duncan's intervention was the United Nations Development Programme (UNDP) forum on "Breaking the Cycle of Poverty". This observation holds true for every development issue and not poverty alone. Openness to participation and information must characterise the approach to placing people at the centre of development and to forging some degree of equity in the society. The wisdom of the recommendation for bi-directionality in information flows between top and bottom is matched by a no less important need for horizontality in flows of information. The latter may well prove to be the more difficult to achieve. Indeed, this is a major area of focus on the present paper.

Reviewing the statements about governance, good governance and information as articulated by and Annan, Duncan, Ramphal and Strassman, a number of statements stand out.

- *Governance is what information management is mostly all about;*
- *Sustainable development requires good governance;*
- *Good governance provides the framework for steering political processes towards a translation of a long-term vision for a nation's social, cultural and environmentally sound economic development into reality".*

From the foregoing statements, information and information management emerge as being essential to sustainable development, which in turn is facilitated by good

[4] Prof. Neville Duncan, of the UWI Department of Government, Building Consensus on Social Policy in Trinidad and Tobago, IDB

governance. Information and information management are therefore essential to inform the decisions that are aimed at securing development and "good governance".

Throughout this paper, unless otherwise specified, the term 'governance' refers to 'good governance'. This paper acknowledges the fact that notwithstanding quality, offices outside the "Central" Statistical offices produce some data. This paper includes such offices in the national information infrastructure.

**Information management**

Information management seeks to provide answers to the developmental areas as perceived by policy. Policy makers, on the basis of their social and political orientation, develop a view of the world or an appreciation of what the society is as opposed to what it should be. This gives rise to the identification of "problems" and "development objectives". An information management system is then created to do the following, *inter alia*:

(a) Gather and process data on the strengths and weaknesses of the society through the examination of social and economic variables;

(b) Analyse the development over time of these variables to ascertain the direction of their evolution;

(c) Benchmark progress in the society against developments in one or more comparator societies;

(d) Inform the political directorate and civil society of the local situation so that consensus could be built as to what changes, if any, should be engineered;

(e) Identify a mechanism for digestion and filtration of the data collected to produce information to be considered by the administration and its planning structure;

(f) Receive feedback from top down and bottom up for modification of the next round of data gathering.

The information management system is assisted by information technology. The policy drivers of the system are people and their networking attributes. The mechanical aspects of presenting data are usually delegated to computer systems while the distillation of data into information requires human intervention. The distillation of data into information will be normative and therefore influenced by a particular view of the world.

Perhaps the most complete definition of "information management" is that of Rowley[5] (1988), in which the writer submits:

> *"Information management includes organisation-wide information policy planning, the development and maintenance of integrated systems and services, the optimisation of information flows and the harnessing of leading-edge technologies to the functional requirements of end-users, whatever their status or role in the parent organisation".*

This paper views information management as being crucial to "good governance", but takes a step back to examine the practice of data collection and suggests ways in which it may be improved.

A number of keywords used in that quoted text are relevant to our discussion. Information management is essential to policy planning. Instead of thinking in terms of a firm, we may adopt the thought to the public sector for purposes of this paper. Integrated systems and services are what will maximise output and optimise information flows.

## Technology

Technology is described as the science or study of the practical or industrial arts. It is also described as applied science. Technology is employed to achieve the best means of accomplishing an objective.

Cybernetics can be described as the study of the complex relationships involving informational feedback. The Encarta Encyclopaedia offers the following definition:

> *"Cybernetics, interdisciplinary science dealing with communication and control systems in living organisms, machines and organisations. The term, derived from the Greek word kybernetes ('steersman' or 'governor'), was first applied in 1948 from the theory of control mechanisms by the American mathematician, Norbert Wiener. Cybernetics developed as the investigation of the techniques by which information is transformed into desired performance".*

There are four key words in the text quoted above: *Governor, information, desired and performance*. These keywords establish the importance of information, monitoring and evaluation to governance. This definition and its analysis corroborate Strassman's observation on governance, as earlier quoted. Of interest in this context, is the use of the word "information" as opposed to "data". The former is invariably value-affected, whereas data are not so affected. Since governance is about the management of information in the interest of furthering policy objectives, data collected would be processed through a policy (or political in that sense) filter to yield information to those who set policy and institute programmes of action to achieve a desired performance.

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[5] Rowley, J E, Basics of Information Technology, London: Library Association, 1988.

The distinction between data and information is important because much of the data gathering will be performed in the public sector. The impartiality of data collection is paramount. The relationship between the main data-gathering arm of the public service and other ministries and departments that engage in data gathering must be well established against the knowledge of what information is needed to inform policy and to monitor the effects of policy implementation.

The most direct definition of governance that the present research effort encountered was the definition offered by the Institute on Governance,[6] a non-governmental organization (NGO) research organization focusing on the promotion of effective governance. The Institute defined it as:

> *"The institutions, processes and traditions which determine how power is exercised, how decisions are taken and how citizens have their say."*

This definition will guide the discussion in the paper, the focus of which will be the demonstration of the importance of information, information architectures, information technology and networking to governance at national level.

## Characteristics of the information infrastructure in the public sector

The public sector is essentially information collecting in nature. Its major task is the facilitation of economic and social development while ensuring the observance of law and order, the collection of taxes and the maintenance of some elements of infrastructure. The public sector is divided into ministries, departments and statutory bodies. Each entity is concerned with a narrow aspect of governance and seeks to deliver in accordance with its mandate. The result is the creation of narrow-based information stacks. Each stack is characterised by "legacy systems" - old data collection and handling systems onto which modifications have been bolted as new data sets are required or different views of the data become necessary. The information design or architecture in the public sector is described as being "vertical". The system, because of the nature of its evolution, lacks elegance in design because of the incremental nature of its development. Within a ministerial information system it is not uncommon for the same type of information to be collected via different administrative forms, which are legal documents and which are subject to change only by parliamentary process. Thus, redundancy is a characteristic of legacy systems and is conducive to response error on the part of the person supplying the data. This type of information system is usually excessively protected by the ministry and data tend not to be shared easily. Such systems are "stand-alone" systems as they are not linked and in many instances do not utilise standardised coding or classification schemes. The data contained in the databases may be considered to be confidential and

[6] Institute on Governance, 122 Clarence St., Ottawa, Ontario, CANADA KIN 5P6. E-mail: info@iog.ca

as such is not shared. Closure of this nature circumscribes very narrowly the usefulness of the data collected.

The entire public service is served primarily by data collected to achieve ministerial or departmental objectives. The narrowness of the information stacks speaks of inefficiencies in the approach to integrated data management. What results are overlaps in the collection of some elements of data and disconnects[7] across the public service. The term "disconnects" refers to the failure of one or more organizations to capture critical information. The disjointed approach to data organization would in such cases have caused some information to "fall between the cracks".

The information infrastructure in the public service is further affected when political will is trained on the solution of a societal problem (which, of course, would have political repercussions). As an example, suppose that the Central Government in its determination to eradicate poverty decides to establish a Poverty Information System and does so in isolation from other related systems. The result will be the creation of another information stack unable to make use of related data on poverty issues that are resident on other systems in the same public service. If, on the other hand, the Poverty Information System is conceived as being one of a number of newly designed information subsystems, connectivity can be built in and both effectiveness and elegance introduced into the design.

The statistical offices of the English-speaking Caribbean have been patterned after the British Central Statistical Office. Their Ordinances closely resemble those of the British Office and are remarkably forward-looking in their provisions. Many of the Statistical Offices have not, however, been able to perform their role as information needs throughout the public service have grown in excess of the ability of the existing information architecture to accommodate the changes. The Statistical Offices were supposed to have been the hub of the national information systems, according to the Statistics Ordinance. They have seen their function usurped by the proliferation of ill-conceived attempts at constructing information systems that lack the rigour and discipline of data management. An uncoordinated approach to households and business establishments to gather data has increased the respondent burden on these entities. Data quality has suffered and in many instances the design of the data collection vehicles (questionnaires) has been so unsatisfactory as to have rendered some of the responses useless.

In the Caribbean, the Central Banks have within more recent times emerged as major collectors of specialised monetary and financial data as part of their overall supervisory authority over the financial sector. They therefore enjoy the same central position as the statistical office, but in respect of their area of specialty as described. Some Central Banks are also responsible for external sector statistics. The surveys that

[7] On the subject of disconnects, Terry Ennis of Du Pont observes in The Horizontal, Business Week Dec 20, 1993, that every time that you arrive at an organizational boundary, you get the potential for a disconnect. He states "the bigger the organization, the bigger the functions and the more disconnects you get".

produce supporting tables to this account, if conducted by the Central Bank, are usually undertaken under authority delegated by the statistical office.

The above description of the evolution and present status of public sector information systems explains the inability of the official data sets to throw light on the contemporary issues. Among these are the nature, incidence and causes of poverty, the demographics of crime and violence and the several views of the imbalance in the sharing of the national wealth.

The *de facto* situation of public sector information systems that have been allowed to engage in questionnaire design and data processing, often without reference to the Statistical Office or the Central Bank, brings the quality of much data collected into question. The failure to put the Central Statistical Office and the Central Bank regarding monetary and financial statistics at the centre of government's information architecture must be corrected before a horizontal approach to national information systems can take place.

## A horizontal approach to information systems

The vertical approach to information systems is essentially the "stand alone" model in which entities, such as government ministries, operate virtually in isolation from others to achieve their objectives. This approach does not encourage the use of common concepts, definitions and classification schemes. The consequence of this type of architecture is the possibility of having two or more organizations arrive at different quantifications or interpretations of the same phenomenon. Zachman's[8] framework provided the standard for enterprise information systems design. In proposing a horizontal approach, it advocated an integrated approach to the collection of data. This approach advocated a great degree of networking among the entities. It provided a methodology to control decentralised chaos that had resulted from the decentralisation of the information collection and management processes. It is evident that the advent of microcomputing has not helped to organize information systems, either throughout the enterprise or throughout the public service, which is the focus of this paper. The following quote from Zachman describes the problem of disintegration that has been facilitated by the technology:

> *"In either case, since the technology permits "distributing" large amounts of computing facilities in small packages to remote locations, some kind of structure (or architecture) is imperative because decentralisation without structure is chaos. Therefore, to keep the business from disintegrating, the concept of information systems architecture is becoming less an option and more a necessity for establishing some order and control in the investment of information system resources."*

There is much to be gained from the use of distributed computing. Distributed computing carries with it an element of empowerment of personnel in a given organization to process centrally accepted datasets into reports and analyses for their ministerial or

[8] John Zachman, Framework for Information Systems Architecture, IBM Systems Journal 26, no. 3, 1987.

departmental or special interest purposes. The facilitation of information to ensure good governance would be much improved if the concepts of database management systems, data dictionaries and horizontal architectures were understood, appreciated and implemented. Their application throughout the public service would provide the data and information sets that could be used to report on and monitor government policy implementation.

## Applying the horizontal approach to information systems in the public service

Using as a point of departure the statement that information management seeks to provide answers to the developmental areas as perceived by policy, any information system, for example, a proposed Poverty Information System, must rely on data that reflect ideally all aspects of the phenomenon of poverty. The information system must gain an appreciation of the geographical location of poverty as well as its characteristics over time. The information system must capture information on the major contributing factors to poverty. It must also identify the indicators to be used to determine poverty and locate them.

The gathering and processing of data on poverty must recognise the existence of several sources of data. The data elements of interest should be collected in such a manner that they fit into an information design and contribute to the understanding of the phenomenon. Data must be collected from the following sources:

- Census records
- Household survey records (where these exist)
- Health records
- Social security records
- Education records
- Housing records

The information required does not reside in any one location. It would be accessible through an organized and integrated data infrastructure. The integration of databases will ensure that there is a minimum of redundancy in data collection. The success in integrating separate datasets will depend on the sponsorship and demonstrated interest in the paradigm as coming from the highest level of government. Applying this paradigm to the data types identified above would involve cooperation across functional boundaries. For example, the Ministry charged with the responsibility of monitoring poverty will see the need to cooperate with the Central Statistical Office, the Ministry of Education, the Ministry of Health and other ministries that collect data that are related to levels of living. The outreach for input information should extend to NGOs and Community-Based Organizations (CBOs) whose focus would tend to be more directed to the "local" or small area level.

The data available will most probably be uncoordinated, repetitious and diffuse. This will render the use of different data sets difficult unless an inventory of the data elements important to the measurement and monitoring of poverty is made. The inventory will identify duplication of data collection throughout the data-collecting

entities and advocate the removal of the duplication, where possible. There will be revealed different levels of data definition. For example, some data will be local level oriented, while other data will be more macro in nature. The designers of the system will need to determine beforehand, the use to which every data element collected will be put. This data mapping exercise will streamline the data collected over all entities and establish the necessity of the data to be collected.

The public sector model will make use of the data sets identified in the inventory exercise and set up processes to utilise the data, regardless of where they are stored. The work flow model will develop from the need to access data from a number of entities. The work flow model must be supported and endorsed at a high level in order to give it "teeth". This level of support is necessary since the activity crosses administrative and ministerial boundaries, with each entity having its own functional pressures which may easily be accorded a degree of importance greater than the need to collaborate inter-organizationally. Support and sponsorship at a high level in the public service will send a clear indication of where the priority should lie.

All departments must contribute to the development of a data dictionary that must be designed ultimately by the Central Statistical Office or the Central Bank in collaboration with the other data collecting and processing agencies. The public sector information system will observe the separation of process from data. The database management system (DBMS) that will be designed should not be compromised by narrow ministerial or special interest considerations. The poverty information system, if properly constructed, should consist of one well-designed member of an integrated database family. That database should be activated at ministry level by software that can process a data set wider than that collected by the ministry to analyse the phenomenon at one or more levels of geography, income or social class. The horizontal approach views information systems from the viewpoint of data, process and technology. The **data architecture** is built around facts (form). The **process architecture** is built around activities (function) and the **technology architecture** is built around physical constraints such as geography, computer hardware and network topology. Table 1 below takes a detailed look at the three architectures.

**Table 1. A detailed look at the three architectures**

| VIEWPOINT | WHAT IS INVOLVED | RESPONSIBILITY |
|---|---|---|
| Data architecture | Identification of data needs<br>Questionnaire design<br>Survey design<br>Derivation of population estimates<br>Imputation for non-response<br>Coding and classification schemes<br>Concepts and definitions<br>Who collects what<br>Periodicity of collection<br>Statistical Unit or unit of enquiry | All actors in collaboration with the Central Statistical Office. |
| Process architecture | Distributed processing paradigms<br>Software<br>Data format conversion<br>Data transfer systems<br>Multiple output formats | All ministries, with the possibility of one Ministry outsourcing its data processing. |
| Technology architecture | Computer hardware configuration in various ministries<br>Size of data files<br>Data transfer modalities | Various ministries |

Bringing about this collaboration in the public service

The move from the vertical *modus operandi* to the horizontal will not take place merely because the public service is peopled by persons of good will. The chief executives of the various organizations are chiefs of their own outfits and will not easily surrender control of what they perceive to be activities under their jurisdiction. Autonomous collaboration will depend on the personalities of the Heads of Department and therefore cannot be guaranteed. The senior public officers are well aware that they operate in a rules-based system. Some consensus should be reached to bring them together with an agreed degree of urgency and priority to work out the collaboration necessary to achieve the objective of networking across organizations. An organ such as a High Level Statistics Priorities Committee should be formed to meet at a strategically appropriate time to streamline the entry into the field to collect data. This machinery will result in fewer surveys; better quality of data collected as a result of expertly designed questionnaires; more efficient and effective data processing; and better results of the data collection, processing and analysis stages. It may also mean the expenditure of less public funds as one slightly expanded survey may cover the needs of two or more other organizations that might otherwise have conducted separate enquiries. The level of representation at this forum should be at a high level by persons who can commit their organizations. If the output of meetings of this committee can be fed into something such as a national information system, the mechanism will earn for itself a purpose (that of contributing to the national information system) and will move to ensure the necessary collaboration across ministerial divides.

Even with the establishment of an official forum such as the Statistical Priorities Committee, there exists the possibility of resistance from Heads of Department who still see the department or ministry as being essentially a "stand-alone" organization with a vertical structure as discussed earlier. The move to the new system should be achieved through the approach of change management. Suspicions of loss of power, ulterior motives and the fear of being taken over by a nebulous "them" must be allayed by explanation of the new paradigm, its benefits and the possibility of it producing a service larger than the sum of the existing "stand alone" parts.

Assisting collaboration – the legal framework and networking

The link between information and governance has been made in this paper. In addition to the provisions for new organs to further the work of interministerial or departmental collaboration and after the orientations to the new way of doing things, the new arrangement should be fully adopted. To this extent, the Ordinances that govern the collection and disclosure of data must be revisited. There are ordinances that enforce the collection of some data and are form-specific. This means that the form cannot be altered except by an Act of Parliament. The form may need to be modified in the light of a changed political, economic, social and technological environment. The changed technological environment may recognise the need for greater networking of people to achieve maximum impact of the relatively scarce information sets available. In order to enhance the possibility of collection of significant quantities of data from each form, the penalties associated with non-compliance must be reviewed and designed to reflect the disservice occasioned by non-response to the entire data-collection effort. This means that enforcement systems should be revised to such an extent that the enforcement of the law for non-compliance should not be aimed at securing more and more fines for the government treasury, but should act as a gentle persuader to the data suppliers to provide the information requested. With respect to collaboration at the level of public sector agency, compliance with the CSO's data requirements must be written into the Ordinance. The Ordinance must be even-handed by its provision for data and information delivery systems as a justification for public expenditure. The commitment of time, human and financial resources must be protected by data delivery requirements, with penalties for non-delivery.

Parallel with the review of the Statistics and related Ordinances, networking should be encouraged across functional borders in the public service. As integrated information systems are put in place, the realisation that government has a value chain or a number of value chains will emerge. The usefulness of networking across the public service to procure supplies at the best prices will be made apparent. In terms of governance, the exploitation of the value chain(s) will effect savings, assisting in the provision of government services at minimum cost.

***What is a value chain?***

The value chain may be regarded as the set of activities within an organization that are crucial to its viability and competitiveness. These activities may be categorized into two groups:

1. Primary activities; and
2. Support activities.

The primary activities are directly related to the main organizational objective such as the manufacture of a particular product or range of products. They include:

1. In-bound logistics such as materials handling or operations,
2. Out-bound logistics such as distribution, marketing and sales and after sales service.

Each of the primary activities involves its own support activities. If each activity within an organization is considered in terms of the value chain, it is possible to identify a possible source of competitive advantage.

Each of the primary activities is supported by other activities related to:

- Procurement, which refers to the processes for the acquisition of the various resource inputs into the primary activities. It does not refer to the acquisition of the resources themselves.
- Technology development that is relevant and appropriate to the primary activity in question.
- Human resource management. This is concerned with the recruitment, training, development and rewarding of staff within the organization.
- Infrastructure. This refers to systems of planning, finance, quality control and the like, organizational structures and processes that sustain the organization's culture.

The set of activities described above refers to the value chain internal to an organization. Apart from the internal value chain as described above, it is possible to identify an external value chain.

***The external value chain – a parallel in the Public Service?***

Johnson and Scholes [9] observe that:

> *"... very rarely does a single organization undertake all of the value added activities from the product design through to distribution to the final consumer".*

[9] Exploring Corporate Strategy, Johnson, G and Scholes, K, Prentice Hall 1993.

This observation is apt when contemplating the public sector as an organization in the business of providing for and facilitating national development [10]. The various ministries may be thought of as separate strategic business units (SBUs) whose activities contribute to the delivery of services that contribute to national development, either directly or indirectly. Any organ is part of a wider value system that is involved in the production of a good or service. The creation of value is as much dependent on the supply and distribution chains as it is on the organization that is the focus of attention. Relating this observation to the public service, one ministry's success is usually dependent on other ministries or private sector organizations that provide inputs into the activities of that ministry or intervene downstream of the product or service. A similar relationship of interdependence exists between any ministry and its counterpart. The result is an interministerial relationship that should be exploited in the interest of public sector efficiency and effectiveness.

***Success factors of the Value Chain include the following 7 Ts:***

- **T**eamwork
- **T**ransparency in development objectives: The development objectives of the organization must be known and must be related to the strategies and tactics employed to achieve them.
- **T**echnology of information (includes numerical databases and data mining). In order to manage both input information which includes procurement, and product or service delivery, information technology is essential to managing the information collected.
- **T**raining in the use of advanced technology that includes Information Technology. Training is an investment in the human resource. Work-related training is essential to the rapid preparation of staff to perform their job schedules. Training in the use of databases empowers the staff member to do a better job.
- **T**ransitivity of modus vivendi as produced by the Value Chain to civil society - effect of the model on people's behaviours. The staff member is also a member of civil society. Behaviours learned on the job cannot be laid aside at the end of the day's work. They are transported to the general behaviours of the individual, even in his functioning as a private citizen.
- **T**ransformation of the development paradigm from product orientation to service orientation. Products are really an unsophisticated and indirect means of achieving a feeling of well-being, whereas well-being is really spiritual or psychic in origin.[11] . The relatively new thrust in the software

[10] National development is a concept far wider than economic development. It encompasses issues such as community empowerment, and the concerns of a host of interest groups in addition to the interest of the nation as a whole.

[11] This has resonance with Maslow's pyramid. Today, the more developed countries of the world have moved on from being essentially manufacturing economies to service economies or 'Post Industrial' economies. Observation of the Retail Price Index suggests an inverse relationship between the importance of Food in the Index and the level of development of the society.

industry has been away from the delivery of software in shrink-wrapped form to downloads[12] via. the worldwide web with a measured productivity.

- **T**argeting of development facilitation to different segments of the society and economy. This will differ from the familiar macroeconomic approach that looks at a national total. The packaging of services and information to reflect development at the local level may require multiple modalities of delivery.

*The above seven Ts are in fact criteria that may be used to assess the level of development.*

## The case for public sector reform

The shift towards "Zachman" horizontality as discussed in this paper will not occur through legislation. The management practices in the public sector have been reinforced by the laws that govern it. Over time, a certain culture of headship of narrow stacks (ministries) has evolved and is more than likely oriented against any suggestion of surrendering control to any other power source.

Many international organizations have intervened in the matter of improving aspects of public sector operation and efficiency. Their interventions have usually been from the viewpoint of their relatively narrow interest and have overlooked the importance of institutional development throughout the public service as a whole. For instance, project activity to develop the agricultural sector takes the modus operandi of the rest of the public service as given and attempts to bolt on changes in the agriculture ministry that may not sit well with the nature of operation of other organs of the public service. This type of intervention is fragmented and is by now understood as not being in the interest of the public service as a whole. Even well-intentioned attempts to assist can exacerbate the problems of the public service. The partial approach to modernization reinforces the adoption of stand-alone solutions that preclude the maximized benefit of networking in a carefully architectured system.

What is needed is for those agencies with their varied interests in a more effective public service to determine the shape that an overhauled public service should take before attempting to "fix" any part of it. In this way, repair work will proceed according to a plan. Clearly, it would be impossible to suspend the working of the public service to introduce a new modality of operation. The change must take place on a phased basis. This means that in any area designated for change activities, the existing system must operate while the new approach is being put in place. A council should approve all change initiatives. That body will ensure that the architecture planned for any given public sector entity is in keeping with the planned architecture for the whole. At the start of the reform process the need to observe the existence of the value chain in government must be registered. This will set the stage for the design of networking throughout the

[12] The Reinvention of Software, John Blackford, Computer Shopper, November 2001.

service. Along with a networking capability will come an upgrade of the human resources in the ministry or department.

Change is always perceived as producing winners and losers. Those who will consider themselves as losers are those who will feel a loss of power or status as a result of the change. They will typically come from middle management if the restructuring produces a flatter hierarchical structure. The winners will be those who, regardless of present position in the hierarchy, can add value to the organization by their skills and flexibility. The former group would tend to resist change in the interest of maintaining the ***status quo***.

Staff, at all levels, needs to be empowered to interface with counterparts in other ministries, with minimal supervision. They must be trained to understand fully their organization's objectives, the degrees of freedom within which they can act and the circumstances in which they must refer to a more senior officer for advice on how to proceed.

Training will therefore be necessary in the areas of negotiation skills; project preparation, management and evaluation; and critical decision-making. Training will also be necessary to enable some staff members to cope with the change, some of which may be a source of trauma to them.

Combining the vertical and horizontal approaches

The new modality of sharing information across functional boundaries while steadfastly working towards the achievement of the narrower organizational objectives may help to create a new kind of manager – the "**T**-shaped manager" (Hansen and von Oetinger, 2001).[13]

The "T-shaped manager" is one who has learnt to live with, and ultimately thrive within tension created by the dual responsibility as described above. He or she must be able to break out of the traditional corporate hierarchy to share knowledge across organizations (represented by the horizontal part of the "T") while remaining committed to individual business unit performance (represented by the vertical part of the "T"). If this model were introduced into the public service, the tension between the vertical and the horizontal approaches would be managed.

The case for public sector reform remains valid even after the introduction of the concept of the T- shaped manager. A few enlightened managers will not be sufficient to transform a public service that has become accustomed to operating in "stand-alone"

[13] See article "Introducing T-shaped Managers; Knowledge Management's Next Generation", Harvard Business Review, March 2001. Morten Hansen is assistant professor of business administration at Harvard Business School and Manager at the Boston Consulting Group Office in San Francisco. Bolko von Oetinger is a senior vice president in the Munich office of the Boston Consulting group and is the director of the firm's Strategy Institute.

mode. The transformation would best be approached through project intervention in which the benefits of the horizontal paradigm can be embedded into a re-design of the operations of the ministries and departments that comprise the public service.

The model of the "T- shaped" manager is by no means an attempt to promote altruism that leads to organizational flaccidity. The manager will have to learn how much to share and what to hold on to in the interest of the acquisition of narrower organizational excellence. No computer software can deliver this skill. At best, expert systems only attempt to understand and emulate human behaviour through the use of "fuzzy" logic.

The new design should recognize the value chain and should facilitate its use through the introduction of an information architecture that would facilitate the transfer and sharing of information. Accounting systems in the public service are already harmonized as they have been designed to fit into a central system. Although information and communications technology will be important to the sharing process, Hansen (2001) cautions that overnetworking through "a bulging Rolodex"[14], as a modality of cross-unit collaboration, is inefficient. A more effective approach would be to cultivate people at various levels in the organization, who reinforce the cross-unit connectivity without having it legislated and "hardwired" into a new architecture, making it as inflexible as the stand-alone culture that has given rise to the islands of information. The essential characteristic of reorganization would be to introduce flexibility to a decentralized organization structure. In this discussion the decentralised organization structure is the public service. The flexibility refers to the human "software" that energises what would otherwise be described as a collection of computer hardware and mission statements. The Rolodex is interpreted to be datasets included in the network. Every care should be taken to ensure that the Rolodex does not bulge with micro data that cannot be utilised effectively in the networked design. It should contain data at an appropriate level of aggregation to satisfy the queries of a variety of data users.

Institutional framework

Recalling Duncan's insistence that the legal and institutional framework should be transparent and formal, those regarding the information system are examined. In the midst of the loud cries for public sector reform or modernisation, Caribbean governments are working with their advisers to identify an effective reform strategy. They have in many cases moved along the philosophical trajectory of the World Bank and other International Financial Institutions (IFIs) to refrain from creating new institutions (institution building). Instead, the thrust has been to strengthen or re-engineer existing institutions in the interest of keeping maintenance costs (calls on government recurrent expenditure) manageable. The convergence of objectives among governments and the IFIs has either been spontaneous or the result of conditioned response to rigid pre-conditions to accessing international financing for public sector reform. Modernised institutions must be designed to work efficiently, effectively and with transparency, just as if they were private sector organizations. The contemporary global market impresses

[14] See "Introducing T-shaped Managers", Harvard Business Review, March 2001.

on governments the need for their public sectors to be accountable for their performance and not only for the use of funds[15].

In fact, a number of services that had formerly been produced by governments are now being turned over to the private sector in the hope that a more focused approach would optimise the service in an economically sustainable manner. Together with privatisation or the creation of authorities comes the increased need for structures that would include these privatised entities in the information net.

This paper recalls Strassman's definition of "governance" as concerning power and applying an understanding of the distribution and sharing of power to the management of information technologies.

Constitutional and common law define the division of power of the offices and agencies that execute and control government policy. In the case of data collection, the legal framework and common practice provide mechanisms that are, by and large, adequate. The data collecting organs of the public service are assisted by laws and ordinances that authorize their officers to enter premises for the purposes of collecting data. Penalties are prescribed for non-compliance with the law. The fines set were intended to act as a gentle persuader to respondents that they should supply the information requested. The quantum of the fines is written into the law and has remained unchanged throughout the years. The result is that today, several firms or other non-respondents would prefer to pay a fine that is insignificant in terms of its purchasing power and significance today *vis-à-vis* its purchasing power and significance at the time when the laws were enacted. In the Caribbean, the legal framework, as represented by the laws against the refusal to comply with requests for data, does not now support the data-collecting ministries and departments. Whereas the fines prescribed are intended to be used in cases where it is clear that there is a refusal to respond to a questionnaire, the preference would be for respondents to be socialized into providing information.

The distribution and sharing of power in the management of information technologies are a function of:

(a) The recognition of a leader in the design and management of information;

(b) The recognition of a leader in the management of information technologies; and

(c) The collective responsibility of all of the players to ensure the smooth functioning of the information systems.

The information systems must incorporate mechanisms for digesting feedback from the user community and making the necessary adjustments to the dataset or to policy for the next round of fact-finding, processing and dissemination.

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[15] Attributed to the World Bank, Caribbean Division, Country Department III, Latin America and the Caribbean, April 1996, Public Sector Modernization in the Caribbean, Report No. 15185 CRG.

## A second approach to information systems in the public service – The GDDS approach

The first approach as suggested in this paper assumed an internal (national) dynamic that would strive for excellence and take the steps necessary to bring about organic change. That approach, as has been discussed, would demonstrate the working of the feedback loop to self-examine and change behaviours in the public service, or even change aspects of the institutional configuration to facilitate critical decision-making in the contemporary world. This approach carries great appeal as it is internally originating and would be relevant to the data needs of the country.

A second initiative towards the achievement of collaboration in the collection and treatment of data in the public service is the current General Data Dissemination System (GDDS) of the International Monetary Fund (IMF) and World Bank. The system elicits methodologies, meta-data and statistical series from countries and, by so doing, encourages dialogue and collaboration between the data producers at national level. Networking across functional boundaries is therefore achieved.

The General Data Dissemination System and the Special Data Dissemination Standard of the IMF in collaboration with the World Bank aims to achieve a set of interactions among public sector entities that is congruent with the paradigm of horizontality that this paper has discussed. The entire data set is designed to enhance transparency in the conduct of government business and paves the way for the recognition and use of the value (supply) chain to minimize the cost of production of government services.

While this approach may yield some organizational benefits by way of a more horizontal approach, it does not immediately solve the problem of incompatible and non-normalized data sets. The GDDS approach does not in addition signal the urgency of a re-design of the national information architecture. The Zachman horizontal approach signals this need more forcibly.

This paper supports the GDDS initiative and urges compliance, but stresses the need for parallel efforts at information architecture and systems redesign.

## Citizen participation

Citizens are the ultimate beneficiaries of development policy. It is to the advancement of their well-being that much of the data collection within the public service is aimed. The fruits of development must filter down to the local level. Measures of development, such as GDP per capita, mean nothing to large sections of society if the fruits of development escape them. Citizens at all levels of society must be empowered through access to information to appreciate and comment on development paradigms and achievements in the economy and society. Information must therefore be packaged to throw light on issues and areas of concern. This will be facilitated by the data

architecture as discussed. The level of detail of data capture must accord with the need to provide information that will be maximally useful.

Citizen participation must be planned and must be designed to be effective. Whereas the Internet may bring information to a section of the community, it cannot be relied on to inform the entire society. A number of physical forums would seem to be the way in which such meetings can be effected.

## Accountability and performance measurement

The information system must be so designed as to provide the basis for the joining of datasets to produce more information than any one dataset could yield. The integrated nature of the architecture and the work demands strict adherence to agreed deadlines and quality of data. Performance at public sector organization level will be measured on the basis of fulfilment of both the narrow organizational goals and the degree to which the organization has engaged in teamwork on a horizontal basis. Performance in the sense of an assessment of the success of policy implementation at any level of government or geography will be measured by the indicators and qualitative information produced by the information system.

## A promise for the future – Open government

Governments have been, to an increasing extent, expressing support for open government, e-government and transparency in the conduct of government affairs. The fact of their recognition of the desirability of embarking on a new solution must involve an examination of the inbound logistics (data collection) and data processing. The main intent is to do business differently from the way in which it was done in the past. Some may point to re-engineering the data collecting organs of the government. Others may point to a modernization of the public sector to deliver a wider range of information to assist and monitor governance. Either course of action requires a clear idea of what is to be done. The best technical advice must therefore be sought. Whatever the advocated solution, it is clear that information is crucial to all aspects of governance. Governments are urged to consider paying attention to the architecture of their information collecting systems with a view to creating an integrated and comprehensive system. This objective will no doubt require project intervention. It will need to be championed at the highest level of government and supported throughout the system. This approach will begin the forging of a new public service culture that can infiltrate the behaviours of all of the social partners and set the platform for development at all levels of society.

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