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Systems Strategies
for Public Financial
Management

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Abstract

Public Financial Management (PFM) is one of the governments' most important responsibilities. In developing countries, in particular, fiscal constraints induced by macroeconomic adjustment programs require efficient PFM both to maintain economic growth and to alleviate the impact of adjustment on the poor. Many governments, therefore, have reform programs in place to improve PFM (often in cooperation with the World Bank and the IMF). An important element of these programs is the development of computer-based information systems to simplify and speed up the business processes associated with PFM.

Normally, a wide variety of computer-based systems support PFM. However, these systems are usually implemented as components of separate projects responding to specific needs, with little appreciation of requirements in other areas, and little thought given to critical interrelationships. As a result, the information systems are often disparate and segmented with little or no capacity for sharing data. They have overlapping and sometimes conflicting functionality and provide incomplete coverage, particularly for managerial information requirements that normally span several functional areas.

This paper develops a strategic framework for the network of systems required to support PFM consisting of: (i) an information architecture; (ii) a systems architecture; and (iii) a technology architecture. To derive this framework, the paper uses a methodology that focuses on the business or functional processes within PFM rather than on the institutions that perform them. This ensures that the framework remains valid in spite of organizational changes, and that it can be used as an implementation roadmap over an extended period of time. This paper addresses questions such as: what are the scope, scale, and type of a particular area's system components; how do these elements interrelate; what are the major issues and options associated with the introduction of these systems; and where do the greatest problems and opportunities lie. The paper also discusses some factors that determine the choice of technology for the component modules of the PFM systems network and approaches to some implementation issues.

It is hoped that the framework and methodology presented in this paper can assist public sector managers in developing countries and task managers from international financial institutions to determine more easily the scope, timing, phasing, resources and priorities of information systems programs for PFM.
Foreword

A large number of Bank lending projects have informatics components. A recent study by Nagy Hanna (ASTIF) has estimated that 90% of lending operations in 1991 contained informatics components comprising approximately $900 million.

ITF has from time-to-time provided technical support to Bank operational projects involving informatics components. Much of this support was provided by the Operations Support Group which specialized in this type of work. In July, 1991, this unit was relocated from ITF to ASTIF and has now moved to the new Vice Presidency for Finance and Private Sector Development. At the request of this group, and directly in response to operations managers, ITF staff continue to provide expert consulting for such work.

Over a period of years, the informatics group and ITF staff have accumulated extensive experience in identifying, defining and evaluating informatics components. It was felt that it would be beneficial if the accumulated data was analyzed and synthesized to describe best practices and lessons learned in the implementation of sector specific informatics components.

This paper, a joint effort between ITF and the Telecommunications and Informatics Division of the Industry and Energy Department in FPD, analyzes experience gained in the area of information systems to support Public Financial Management (PFM) and develops a framework for development of information systems in this area. The framework and methodology presented should be of help to task managers and country officials in planning investments in PFM related information systems.

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A. Introduction

1. The importance of Public Financial Management (PFM) in developing countries has become increasingly evident in the context of their fiscal constraints. As a consequence, both the Bank and the IMF have undertaken operations in several countries designed to improve the management of this area.

2. An important element of the PFM reform process has been the development and implementation of computerized information systems to support the associated business processes. Such initiatives have formed important components of several Bank projects (e.g., in Jamaica, Bolivia, Kenya, and Papua New Guinea).

3. Normally, a wide variety of computer-based systems support PFM. For example, computer-based information systems assist developing countries in:
   - adjusting to changing macro-economic conditions;
   - improving the effectiveness of public expenditure programs by developing and implementing mechanisms for fiscal planning, budgeting and evaluation;
   - managing external resources available through foreign aid programs;
   - mobilizing domestic resources;
   - managing the size and efficiency of the civil service; and
   - disseminating information within government and to the private sector.

However, these systems are usually implemented as components of separate projects responding to specific needs, with little appreciation of requirements in other areas, and little thought given to critical inter-relationships. As a result, the information systems are often disparate and segmented, with little or no capacity for sharing data. They have overlapping and sometimes conflicting functionality, and provide incomplete coverage, particularly for managerial information requirements that normally span several functional areas. Developing a framework that provides an overview of the entire systems network required to support PFM and which can serve as a road map for implementation purposes, is therefore, of value in planning and implementing projects with PFM systems components.

4. This paper will attempt to develop such a framework and answer questions such as:
   - what are the different information systems required to support the business processes associated with PFM; what are the scope, scale, and type of a particular area's system component; how do these systems interrelate; what are the major issues and options associated with the introduction of these systems; and, where do the greatest problems and opportunities lie.

5. It must, however, be pointed out at the outset that a purely computer systems-based response to the problems encountered in public financial management would be inappropriate. Implementing and streamlining computer-based information systems are normally undertaken as part of engineering or re-engineering the broader operation. First,

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1See Hanna, 1991.
the business processes, procedures, the legal regulatory framework associated with the management of public expenditure, and the institutional capacities of the relevant government agencies are analyzed, inadequacies highlighted, and appropriate corrective measures identified. Computer systems are then introduced to assist in the implementation of the corrective measures. Benefits actually realized from an implementation of computer systems depends on the degree of success achieved in strengthening the basic business processes and organizational arrangements related to PFM.

B. Methodology

6. A systematic analysis of business or functional processes, information content, and information flows can help establish a coherent framework for addressing problems – both technical and organizational. In this paper, the authors apply a widely-used analytical methodology known as Information Strategy Planning (ISP)\(^2\) to the problem of Public Financial Management in developing countries. This analytical methodology yields a generic framework that links functions to information systems and ultimately to technology and implementation issues.

7. The analysis starts with developing an understanding of the functions associated with PFM and the information required by these functional processes. This includes:

- defining the basic functions associated with PFM. This step involves preparation of a description of each functional process showing what the process entails and how it fits in the PFM framework;

- identifying the information created and required by each function;

- identifying which agencies are responsible for specific PFM functions. It is recognized that the organizational responsibilities for functional processes could vary from country to country and with time. Therefore, the organizational groupings used in this analysis and the names used in the paper are generic in nature and pertain more to the function being performed rather than an actual organizational unit. Examples are: Central Bank, Ministry of Finance, Planning Agency, Revenue Collection Agencies, Line Ministries, etc.;

- determining the information flows between the processes and the nature, volumes, and frequency of these flows. This also involves determining whether the information associated with the functional process is kept at a central location or is decentralized to different regional locations throughout the country. If it is the latter, it also involves determining how frequently this information is required to be aggregated at the center or referred to by other agencies of government;

\(^2\)The Information Strategy Planning (ISP) methodology, promoted by IBM as Business Systems Planning (BSP) was widely adopted in the late 1970s, to define the nature and scope of the information systems required to support organizations, and the strategies to be pursued for the introduction of such systems. The ISP methodology has been described in detail by James Martin in his book on information engineering (Martin 1990). ISP is a structured methodology based on the premise that the enterprise's information systems and technology should directly support its business objectives. The methodology enables the scope, characteristics, needs, and priorities of the information systems to be derived from a top-down analysis of the enterprise's business processes. By focusing on business processes (which are relatively unchanging), rather than on organizational groupings (which tend to change more often), the methodology arrives at systems configurations that will be more enduring and independent of organizational groupings.
determining the data characteristics of the information used and created by
the function. This involves determining whether aggregate or detail data is
required; whether the data pertains to a specific time slice, or time series
information is required; whether the data is textual or alphanumeric, etc.

C. Components of an Information Systems Strategy for Public Financial
Management

8. Using the above methodology, the following elements of the PFM systems
framework were produced:

(i) **PFM Functional Processes and their Information Requirements.** The ISP
methodology requires an understanding of the functional processes of an
organization and the information requirements of these processes. To
complement our own experience in the PFM area, we referred to a number
of Bank and IMF publications where these processes have been discussed\(^3\)
and compiled a list of the processes and their information requirements.
This list is attached as Annex I. Organizational responsibility for these
processes is shown by the table in Annex II. This list was validated by
interviews with Bank staff who have worked in this area and are familiar
with these processes. It is recognized that PFM functional processes do
vary to a degree from one country to another when viewed in detail. They
are, nevertheless, sufficiently similar across countries to enable formulation
of a framework. This framework may, however, need to be adjusted to
account for country-specific differences.

(ii) **Information, Systems and Technology Architectures.** The ISP
methodology uses information or functional processes and their information
requirements to derive three key products which together constitute the
framework for PFM. These are the information the systems, and the
technology architectures.

(a) The **information architecture**\(^4\) establishes an overview of the inherent
data structure and functional processes associated with an enterprise.
It identifies the interaction between the functional processes and their
information requirements and provides a basis for defining the
databases and information systems for the enterprise.

(b) The **systems architecture** is a model of the information systems
major databases and information flows required to support the
information architecture. It provides the basis for planning

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\(^3\)See Lacey, 1989; Bird and Stevens, 1991; Premchand, 1983; Antonaya, 1988; De Zoysa, 1988; Allan and

\(^4\)To derive an information architecture, first, an analysis of the affinities and information coupling between
functional processes is carried out. Those processes most closely related in terms of their information
requirements are grouped together. The data classes generated by these processes are similarly grouped.
This causes all the data generated or used by the PFM functional process to be divided into discrete groupings
called information areas. The information architecture leads naturally to the systems architecture which identifies
the major component modules of the systems network required to support PFM functional processes. The type of
information contained in each information area, together with the nature of its functional processes, determines
the nature of the systems support that will be required for that area. The information flows between the various
areas of the information architecture and with the external environment define the nature of the interfaces between
the component systems modules required to support PFM.
development and ensuring integration between the component elements. The information architecture and the systems architectures, taken together, provide a framework for the entire information systems network required to support PFM and serve as a road map for implementation purposes.

(c) The technology architecture – an identification of the major functional characteristics of the component modules of the systems architecture helps determine technology choices for the hardware and software that would be appropriate to set up the various modules. This is the technology architecture.

D. The Information Architecture for Public Financial Management

9. Figure 1 shows a summarized generic representation of the information architecture for Public Financial Management. The detailed analysis on which this diagram is based is given in Annex III. This schematic representation shows nine well defined business process groupings and information areas applicable to the management of public finance. The types of information contained in each of these areas include:

(i) **Macro-Fiscal Planning**

*Fiscal Policy and Medium-Term Expenditure Plans (MTEP).* This area contains information generated by the business processes associated with the preparation of the medium-term expenditure plan. This includes information on the MTEP, the macro-economic targets (such as GNP, inflation rates, interest rates, Central Bank deficits, etc.), the Public Sector Investment Program (PSIP), and the fiscal plans.

(ii) **Budget Preparation, Monitoring and Control**

*Budget and Cash.* This area contains information related to the preparation, implementation, monitoring, and evaluation phases of the budgetary process maintained by the core agencies (Ministry of Finance [MOF], Planning, etc.). This includes information on:

(a) budget guidelines; ceilings and sectoral allocations; budgeted allocations – capital and recurrent, and sources of financing for programs and projects; data on virements (budget transfers) and supplementary allocations; data on warrants – actual fund releases against budgeted allocations over the course of the year; summaries of commitments and expenditures against budgeted figures by program and project; and overall cash flow forecasts based on program and project expenditure plans and schedules;

(b) periodic reviews of the aggregate position as contained in the fiscal reports and budget reviews prepared during the course of the fiscal year; and

5 Normally there are several levels in the hierarchy of government, including the central government, provincial or state governments and local governments. This paper restricts itself to a discussion of the functional processes associated with PFM at the Center. The concepts presented here would, however, also apply to operations at subordinate levels to the extent the functional processes discussed here are relevant to these levels.
Information Architecture for Public Financial Management

**Business Processes**
- **Macro Fiscal Planning**
  - Develop Macro Economic Framework
  - Develop Public Sector Investment Program
  - Prepare Fiscal Plan

- **Budget Preparation, Monitoring and Control**
  - Make Initial Budget Allocations
  - Issue Budget Call Circular
  - Prepare Annual Budget Submissions
  - Prepare Draft Budget
  - Finalize Budget
  - Authorise Budget Adjustments/Supplementaries
  - Prepare Overall Cash Flow Forecasts
  - Release Funds to Agencies
  - Monitor Cash Flows
  - Issue and Redeem Securities
  - Prepare Fiscal Reports
  - Monitor/Evaluate Budget Implementation

- **Management of the Public Sector Work Program**
  - Receive Budget Authorizations
  - Prepare Expenditure Plans
  - Authorise Expenditure
  - Procure Goods and Services
  - Pay/Receive for Goods and Services
  - Request Budget Adjustments
  - Monitor Progress on Agency Programs and Projects

- **Debt Management**
  - Float Domestic Loan Offerings
  - Account for Receipts
  - Project Debt Service Requirements
  - Service Debt

- **Foreign Aid Management**
  - Coordinate Aid Inflows
  - Disburse and Account for Aid

- **Revenue Administration**
  - Administer Tax Revenues
  - Administer Non Tax Revenues

- **Human Resource Management**
  - Develop Civil Service Strategies and Policies
  - Administer Civil Service
  - Administer Compensation and Benefits
  - Administer Retirement Benefits

- **Government Accounting**
  - Administer Payment and Receipt Systems
  - Maintain Budget Ledgers
  - Maintain General and Subsidiary Ledgers
  - Account for Fixed Assets
  - Account for Inventory
  - Develop Costs for Programs and Projects

- **Auditing**
  - Perform Audits

**Information Areas and Data Classes**

- **Fiscal Policy and Plans**
  - Macro Economic Framework
  - PSIP
  - Budget Policy

- **Budget and Cash**
  - Init. Bud. allocations
  - Budget Guides/Ceilings
  - Line Agency Subm.
  - Draft Budget
  - Approved Budget
  - Budget Adjust/Suppl.
  - Cash Flow Forecasts
  - Budget Warrants
  - Liquidity Position
  - Govt Issues/Redept.
  - Fiscal Reports
  - Budget Reviews

- **Pub Sector Work Program**
  - Budget Authorization
  - Expenditure Plans
  - Expd Authorizations
  - Procurement Documents
  - Payment/Receipts
  - Requests for Bud Adjst
  - Proj/Prog Reviews

- **Debt**
  - Loan Offerings
  - Data on Dom Borrowings
  - Debt Service Payments
  - Debt Service Requirements
  - Debt Service Payments

- **Foreign Aid**
  - Proj.-Specific Aid Alloc
  - Data on Ext Borrowings

- **Revenue**
  - Revenues
  - Data on Tax Revenues
  - Data on Non Tax Rev.

- **Human Resources**
  - Civil Service Strat. and Pol.
  - Personnel Actions
  - Data on Employees Benefits
  - Data on Retirement Benefits

- **Government Accounting**
  - Receiv/Payable Ledgers
  - Budget Ledgers
  - General/Gen. Sub Ledges
  - Fixed Asset Ledges
  - Stores Invent Ledges
  - Cost Accounts Reprts

**Audit Flows**
- Audits
- Audit Reports

**External Information**
(c) information on the liquidity position of the government, based on information on cash balances in various government accounts, data on government bonds, treasury bills and cash deposit maturities, cash flow forecasts, fiscal reports and debt reports, information on issues, and redemptions of government securities generated on the basis of the liquidity position.

(iii) **Management of the Public Sector Work Program**

Public Sector Work Program (PSWP). This area includes information on:

(a) detailed descriptions of programs and projects to be undertaken by the various line agencies, broken down by fiscal year, including project plans, schedules, milestones, performance indicators, and project and program status/progress reviews;

(b) expenditure plans for the programs and projects based on schedules and progress to date;

(c) summaries of commitments and expenditures against budgeted figures; and

(d) procurement tracking and contract monitoring information.

This information area includes detailed information on programs and projects to be executed by line agencies over the fiscal year. Summaries of this information are provided by the line agencies to the core agencies during the budget formulation and implementation phases. The summarized information is part of the budget information area described above. On the other hand, information on budget allocations (and adjustments to these allocations) for programs and projects maintained as part of the budget information area, is provided by the core agencies to the line agencies.

(iv) **Debt Management**

Debt. This area contains information on public domestic and external borrowings. This includes information contained in loan documents and loan transactions generated against these loans, forecasts of drawdown and debt-servicing liabilities, and debt implications of different fiscal and deficit financing policies.

(v) **Foreign Aid Management**

Foreign Aid. This is a subset of the public debt databases. Data with respect to external borrowings, grants, and grants-in-aid is usually maintained separately and includes, in addition, program and project-specific information for which the loan has been granted and information on loan disbursements related to project performance.

(vi) **Revenue Administration**

Revenues. This area contains information on all tax and non-tax revenues, including data on tariff rates and rates for services which generate non-tax
revenues, data on actual collections for each category of tax and non-tax revenue, and historical data on collections.


*Human Resources (HR)*. This area contains information on the business processes associated with Human Resource Management. This includes government HR strategies and policies, authorized civil service complements for various agencies, data on civil servants on roll and personnel actions related to these civil servants, and data on compensation and benefits paid to civil servants and retirees.

(viii) Government Accounting

*Government Accounts*. This area contains information related to the operation of the government's payment and receipt systems, and maintenance of government accounts. This includes information on payments, expenditure authorizations, receipts and other financial transactions related to the public sector work program, external and domestic borrowings, revenue receipts, payments to and receipts from civil servants and retirees, inventory, fixed assets and cost accounting, etc.

(ix) Auditing

*Audit*. This information area contains information on audit observations and queries relating to government business processes and associated transactions and the follow-up actions taken or pending, relating to these observations.

E. Information Flows

10. Several types of information flows occur between the various areas of the information architecture. The major information flows illustrated in Figure 1 are discussed below:

(i) Fiscal Policy and Planning Flows. Three types of information flows are involved in this category. *First*, during the policy and plan formulation stage, information flows occur from several areas of the information architecture to the Fiscal Policy and Plans area based on which the government's fiscal policy and budget plans are formulated. Once the policy and plans have been consolidated, the *second* set of information flows from the Fiscal Policy and Plans to the other areas of the information architecture provide the governance and guidance for the execution of the public sector work program and other business processes associated with PEM. *Finally*, as the fiscal year progresses, information feedback from the other areas of the architecture to the Fiscal Policy and Plans area, in the form of fiscal reports and expenditure reviews, forms the basis for adjusting the plans and policies in the light of actual progress.

(ii) Accounting Information Flows. During the course of the fiscal year a large number of commitment, payment, and receipt transactions take place that need to be recorded in the government's books of accounts. Examples are: commitments, payments and receipts relating to the programs and projects associated with the public sector work program; government receipts from...
tax and non-tax revenues; loan inflows and repayment related to domestic and external borrowings; and payments and receipts from civil servants and retirees.

(iii) **Cash Management Flows.** These represent the information flows on cash balances from the accounting area and the cash flow forecasts that form the basis of determining the liquidity position of the government. Information on the cash position feeds back to Budget and Cash Management area and determines the allocation of money (warrants) to the public sector program and projects.

(iv) **Public Sector Work Program Flows.** These represent the information flows from the PSWP area to the HR and the foreign aid areas and represent information on:

(a) the HR transactions relating to the changes in the authorized complement (e.g. creation of new posts) or civil servants on roll (transfers of civil servants), in response to work program priorities or as part of the normal career progression of civil servants; and

(b) project-specific foreign aid disbursements.

(v) **Audit Flows.** These represent the flows to the audit information area that form the basis of the audit observations pertaining to the different areas of the information architecture, and the corresponding feedback from the audit area to these areas.

(vi) **External Information Flows.** These represent the information flows to and from the component boxes of the architecture to the external environment. Thus, for example, external data from economic databases (e.g., prices) forms an important input to the macro-economic management processes; information on government policies such as rates of customs duties and income taxes need to be disseminated to the external environment, etc.

F. **Systems Architecture for Public Financial Management**

11. **Figure 2 shows the systems architecture, which is based on the information architecture for PFM described above. Each box of this diagram may be seen as a potential business support system that may comprise a number of subsystems. Each group of systems uses information from a number of different databases. The information flow between the systems modules and the PFM information areas are also shown in the diagram. The major groups of information systems required to support the PFM business processes are discussed below.

(i) **Systems to Support Macro-Fiscal Planning.** This group of systems assists the MOF and the Planning Agency in the business processes associated with macro-fiscal planning including the development of the macro-economic targets, the PSIP and the fiscal plan which form the basis of the government's fiscal policy. These in turn are used by the MOF to set aggregate budget parameters and guidelines for spending agencies to submit budget estimates.
The business processes associated with macro-fiscal planning requires, inter alia:

- economic data from external economic databases;
- information on programs and projects that the government intends to implement over the period of the program, including program status and sources of financing;
- data on tax and non-tax revenues;
- data on domestic and external borrowings including information on debt servicing liabilities and loan disbursements;
- data on the civil service complement, etc.

This means that the group of systems supporting macro-fiscal planning need to interface with the systems and the subject area databases that maintain the information specified above. These interfaces are shown schematically in Figure 2.

(ii) **Systems to Assist in Budget Preparation, Implementation, Monitoring and Evaluation.** This group of systems forms the core systems support for the budget preparation, implementation, monitoring, and evaluation processes and is required by both the line agencies and the core ministries (MOF, Planning, etc.). Five type of systems are involved:

(a) **Systems to Assist in Budget Preparation.** At the start of the budget preparation phase, these systems receive submissions from the various line agencies containing details of their proposed programs and projects, consolidate them, and produce the documents that form the basis of the negotiations with the line agencies. After finalization of the budget, the systems produce the approved budget estimates.

(b) **Systems to Monitor Budget Implementation.** These systems are the primary repositories of data on: budgeted allocations (both capital and recurrent) and sources of financing for programs and projects; budget transfers and supplementary allocations; fund releases (warrants) against budgetary allocations during the course of the year; and, summary data on commitments and actual expenditures against budgeted allocations derived from the accounting databases. This data is used to monitor the budget implementation process.

(c) **Systems for Fiscal Reporting and Budget Evaluation.** These systems use data maintained in their local databases along with that maintained by the group of systems responsible for maintaining information on revenue collections, public debt, accounting and human resources, to monitor and evaluate the overall budget implementation processes and prepare budget reviews and fiscal reports. This provides the feedback loop to the fiscal planning and policy area and provide the information required to make adjustments as the need arises.
(d) **Systems for Cash Management.** These systems maintain an up-to-date picture of the government's liquidity position and cash requirements. By comparing data from cash flow forecasts and fiscal reports with data on cash balances, government bonds, treasury bills, and cash deposit maturities, this group of systems helps the government decide on the amount of fund releases and issues, and redemption of government securities to provide short-term financing for shortfalls in cash.

(e) **Systems for Monitoring Public Enterprises.** In situations where a substantial part of the PSWP is carried through Public Enterprises, a separate module is required to monitor key indicators of Public Enterprise performance.

(iii) **Systems for PSWP Management.** These systems are mainly used by the line agencies to keep track of the physical and financial progress on programs and projects included in their work programs. They maintain detailed data on these programs and projects and provide summaries of this information to the central systems. In addition, information maintained by these systems is used to prepare cash flow forecasts on the basis of the plans and schedules of programs and projects and to track progress on procurement related to these programs and projects.

In a technologically advanced environment, the MOF's budget monitoring systems would directly tap into the agency systems for information on programs and projects. The line agencies, on the other hand, would obtain information on the status of their budgetary allocations, budget transfers, and warrant releases by tapping into the central system. However, it is more likely that the central system will depend on submissions from other agencies for its data input and provide periodic output to be used by line agency systems.

(iv) **Systems for Debt Management.** This group of systems maintains the information on all government loans and assist in the business processes associated with debt management including the servicing and accounting of all existing loan liabilities. They provide important information required in the formulation of fiscal policy (for example, the debt implications of different fiscal and deficit financing policies). The debt management system is one of the subsidiary accounting systems and, therefore, provides input to the overall receipt and payment systems. Systems for debt management are normally operated by the Treasury or the Central Bank.

(v) **Systems for Foreign Aid Management.** This group of systems forms a subset of the group of systems responsible for debt management and maintain information on external borrowings, grants, grants-in-aid, etc. They track loan disbursements against specific projects and programs and relate these to the progress of work on the projects and programs. These systems are normally operated by the MOF and the Planning Agency.

(vi) **Systems for Revenue Administration.** This group of systems assists government tax collection agencies and the agencies responsible for the collection of non-tax revenues. A number of separate systems are involved in this group: for example, those supporting the administration and collection of income taxes, customs duties or VAT, and those supporting
the collection of the various types of non-taxation revenues such as stamp duties. They account for all receipts and provide feedback information on actual collections. They also provide summary information on revenue collections to the central government accounting systems and form an important module of the government's overall receipts systems.

(vii) **Systems for Human Resource Management.** This group of systems is responsible for maintaining the data on the government's civil service policies, the authorized civil service complement for various programs and agencies, civil servants on roll, and the personnel actions related to these civil servants. This group of systems would consist of several interrelated modules. Among these would be:

- modules for staff planning and complement control, which would keep a record of the authorized complement and skills requirements for various agencies;
- the personnel information system that maintains the personal data for all civil servants on roll and all personnel actions related to these civil servants;
- career planning and training modules that assist in these aspects of HR management;
- a payroll system that administers the pay and benefits package for the civil servants on roll; and
- a pension system that administers the retiree benefits.

The payroll and pension systems are, in fact, subsidiary modules of the government's overall payment systems. The HR systems interface with the systems responsible for managing the public sector work program and the accounting systems. Since the business processes associated with HR management are still quite centralized in a large number of countries, these systems are often located at the government agency primarily responsible for managing the civil service. The central system provides periodic output for the use of other agencies.

(viii) **Accounting Systems.** This group of systems are required for processing the government's payments and receipts and for maintaining the government's books of account. A description of these systems has been given by Allan and Woolley (1992). Normally, the following systems are maintained: General Ledger, Budget Ledger, Commitment Ledger, Accounts Payable System, Accounts Receivable System, Fixed Asset Accounting System, Inventory Control System, and Cost Accounting System.

The General and Subsidiary Ledgers are implemented at two major levels, at least: **First,** a General Ledger System (GLS) at the Treasury or another division of the MOF as the official record of the aggregate budgetary, and asset and liability accounts; **Second,** a GLS and associated subsidiary system catering to the payments and receipts and other accounting transactions, maintained at the line agencies concurrently with the central system. These systems interface with the central system to post summary data. The receipt and payment systems at both levels should incorporate the
capacity to handle receivables and payables in addition to simple receipts and payments.

Systems for the administration and maintenance of various forms of tax and non-tax revenues need to be linked to the main receipts system at the center. Similarly, receipts and payments related to government borrowing and foreign aid handled by subsidiary systems for debt and foreign aid need to be posted to the central systems. The payroll, pension, and employee advances systems also post summaries to the central system periodically.

Systems for fixed-asset accounting maintain records of all government assets and makes provisions for the annual valuation and eventual disposal of assets. These systems are useful for agencies (such as the Public Works Department) that are responsible for a large stock of assets.

Systems for cost accounting provide facilities for accumulation of costs for products and/or services. They are useful for agencies where cost recovery is required for services and products. The inventory accounting systems maintain the inventory and stores accounts for government.

(ix) Systems to Support Auditing. These systems assist in the business processes associated with auditing of government expenditures and processes. They also keep a record of audit observations/queries and track progress and follow-up actions.

G. Technology Architecture

12. The technology architecture defines the nature of the hardware, software, and communications technology required to support the information and systems architectures. The components of a technology architecture include:

- the nature, size, and distribution of the computer-processing facilities and associated workstations;
- the nature of the communications interconnections between the computer processing facilities; and
- the nature and type of
  - applications development and systems software
  - database management systems software (DBMS)
  - office support systems software
  - special purpose software to support analytical capabilities, text management, desktop publishing, etc.

13. The technology architecture provides the basis to:

- select appropriate technology to support the systems architecture;
- guide acquisition of hardware, software, and communication facilities; and
- ensure integration and compatibility of component elements of the architecture.
14. The elements of the technology architecture will be country specific. This paper, therefore, restricts itself to a discussion of the factors which need to be kept in mind while making technology choices.

(i) Application-Specific Factors. The technological requirements for the various systems modules described in the foregoing could vary quite significantly. Some of the application-specific factors that define the functional characteristics of the application system and determine the choice of information technology are:

- the volume of data to be handled and the sizes of the databases required to be maintained;
- the volumes and rates of the transactions that take place against the databases and the numbers of concurrent users of the system;
- the volumes and frequency of the information flows between component parts of the system or with other systems modules;
- whether the information processing requirements are centralized to a single location or are distributed to a number of widely separated locations, and if the latter, how frequently the information maintained by the system is required to be aggregated at the center or referred to by other agencies of government;
- the type of data handled by the system: whether it is primarily alphanumeric or textual; and whether it pertains to a given time slice or, requires time series;
- the nature of output facilities required by the system: desktop publishing, graphics, report writing, and imaging;
- the nature of analytical facilities required, e.g., modeling, statistical analysis tools, etc.; and
- whether off-the-shelf software packages are available to assist in the implementation of the system.

The systems characteristics identified in Table 1 broadly define the information technology requirements of the systems modules. In general, the data volumes and transaction rates determine the computing power requirements at a particular node of the system and the degree of sophistication required in the database management software used. The larger data volumes and high transaction rates would generally require larger mainframe computers. However, the increasing power and sophistication now becoming available with microcomputers hooked up to networks has made the distinction less clear. High transaction rate systems with a large number of concurrent users require sophisticated database management software.

The data distribution profiles and the nature and frequency of information flows between component modules of the system or with other modules of the PFM network, determine the nature of the telecommunications facilities that will be required. The frequency of information flows between the
<table>
<thead>
<tr>
<th>Systems For:</th>
<th>Relative Data Volumes and Transaction rates</th>
<th>Dist. Processing; Online Data Transfer and access facilities</th>
<th>Analytical Modelling, and Statistical Analysis Facilities</th>
<th>Text Management Facilities</th>
<th>Desktop Publishing Graphics, Report Writing Facilities</th>
<th>Availability of Packaged Software Solutions</th>
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<tbody>
<tr>
<td>Macro Fiscal Planning</td>
<td>Low</td>
<td>Periodic transfer of data to center</td>
<td>Economic modelling, statistical analysis and spreadsheets</td>
<td>Some text management facilities</td>
<td>Good report writing and graphics</td>
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<tr>
<td>Budget Preparation</td>
<td>Moderate</td>
<td>Some distributed processing; online data access and transfer</td>
<td>Some analytical capabilities</td>
<td>Some text management facilities</td>
<td>Desktop publishing; Good report writing and graphics</td>
<td>Available for core requirements in the Budget Implementation and Evaluation areas</td>
</tr>
<tr>
<td>Implementation &amp; evaluation</td>
<td></td>
<td>a definite advantage</td>
<td></td>
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<tr>
<td>Public Sector Work Program</td>
<td>Moderate</td>
<td>Dist. processing; periodic transfer of data to center</td>
<td>Analytical and project management tools</td>
<td>Some text management facilities</td>
<td>Good report writing and graphics</td>
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<tr>
<td>Management</td>
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<td>Debt Management</td>
<td>Moderate</td>
<td>Periodic transfer of data to center</td>
<td>Some analytical capabilities</td>
<td>Good report writing and graphics</td>
<td>Available for core requirements</td>
<td></td>
</tr>
<tr>
<td>Foreign Aid Management</td>
<td>Moderate</td>
<td>Periodic transfer of data to center</td>
<td>Some analytical capabilities</td>
<td>Good report writing and graphics</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Revenue Administration</td>
<td>Very High</td>
<td>Dist. processing; on-line access and transfer a definite</td>
<td>Some analytical capabilities</td>
<td>Good report writing and graphics</td>
<td>ASYCUDA, a customs package developed by UNCTAD, is under implementation in about 50 countries</td>
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<tr>
<td>Human Resources Management</td>
<td>High</td>
<td>Some dist. proc.; periodic transfer of data to center</td>
<td>Some analytical capabilities</td>
<td>Text management facilities</td>
<td>Good report writing and graphics</td>
<td>Available for core requirements</td>
</tr>
<tr>
<td>Accounting</td>
<td>Very High</td>
<td>Dist. processing; online data access and transfer a definite</td>
<td>Some analytical capabilities</td>
<td>Good report writing and graphics</td>
<td>Available for core requirements</td>
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<td>advantage</td>
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</tr>
<tr>
<td>Auditing</td>
<td>Moderate</td>
<td>Periodic transfer of data to center</td>
<td>Specialized analytical facilities</td>
<td>Text management facilities</td>
<td>Good report writing and graphics</td>
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nodes of the network determine whether the telecom link needs to be active all the time or whether information transfer at periodic intervals would suffice. Thus, for example, information systems to support tax administration would ideally have distributed processing facilities available at all important taxation centers, which would be connected with each other and with the center by telecommunications facilities. On the other hand, systems for fiscal planning or debt management, which are primarily operated by the MOF, would need only limited telecommunications access to other systems on the network.

Systems that handle large quantities of text information, as opposed to straight alphanumeric information, require special text-management software. Similarly, systems that require image processing capabilities have special hardware/software requirements. Systems that require special analytical or modeling tools, graphics, desktop publishing or report writing capabilities require the use of appropriate software for this purpose.

In general, it is advisable to opt for packaged software solutions where feasible. Packaged software can be acquired for systems with relatively standardized requirements. However, efforts should be made to ensure that the chosen software provides the core functionality required and that it is written in an environment (e.g., using fourth generation languages, application development tools and relational database management systems) that makes it easy to add to and change its features. The use of these tools also increases application development productivity and provides easy-to-use facilities for end users. Systems with country-specific requirements may need to be custom developed. The cost and risks associated with such projects are higher.

(ii) The Use of "Open Systems Architectures". Recent developments in the area of "open systems" are trying to ensure that hardware and software manufactured by several vendors that subscribe to this concept can be substituted for each other. Use of hardware/software that conform to open systems standards, therefore, adds tremendous flexibility in technology choices.

(iii) Software Portability. Some proprietary software packages are portable across several vendor platforms and across the whole range of hardware from micro-computers to mini-computers to mainframes. Portability of applications software to different hardware environments ensures that organizations are not locked into one proprietary line of hardware, and that applications that use this software can be scaled to different environments.

H. Implementation Issues

15. A full discussion of all implementation issues associated with building information systems for PFM is beyond the scope of this paper. We will restrict this discussion to some issues which we have found to be particularly relevant to the implementation of PFM systems. Factors that need to be kept in view while initiating a project to improve or implement computer-based information systems to support public financial management include:

(i) Awareness of the Scope and Dimensions of the Exercise. The systems for budgeting, accounting, revenue administration, human resource
management, and debt management constitute the basic transaction-processing systems in the overall network required to support PFM. They are the repositories of most of the data that is required by the other modules of the network and form the foundation for modules of the network that support fiscal planning and provide the decision support mechanisms. These systems are characterized by high data volumes, and several of them require distributed processing facilities. The order of magnitude of effort involved in their implementation is much higher than those for the other systems in the network. The high data volumes and transaction rates associated with these systems make them primary candidates for computerization. As a matter of fact, in the absence of some form of automation, these areas are liable to generate severe backlogs of data, which can result in major gaps in the information required for fiscal management. These areas therefore present the major opportunities for automation. In view of their size, however, they also represent the systems most likely to encounter problems if the implementation process has not been planned carefully.

Development of an overall framework outlining the nature and scope of the different modules of the information systems network and the interconnections between these modules would enable the project to be put in proper perspective. It will focus attention on the specific parts of the systems network that are included in the scope of the project, and what other modules would these systems need to interface with.

(ii) Project Management Strategy. The implementation of government-wide computer systems to support PFM is a substantial undertaking. It is very important that project planning methodologies are used to plan, implement, and monitor the project, with project management responsibilities clearly identified. It is advisable to implement such projects in a phased manner so that they can be put in place and adequately monitored in a controlled environment. A phased implementation also ensures that they do not exceed the absorptive capacities of the organizations where they are implemented.

Ensuring project sponsorship at the highest levels of the functional areas and participation from the widest range of users is necessary in all phases of the project. Senior Management input is particularly important during the earlier planning and design phases of the project. The main skill requirements for these phases are an in-depth knowledge of the functional area and a managerial capacity to ensure that the project is accepted by users. The technical aspects become important only during the later implementation phases. To ensure this, it is desirable to set up a steering committee headed by a senior level manager and members from different user groups. This committee would be a vehicle to provide user input to the technical team responsible for implementing the project. Steps taken to involve users in the design and implementation phases also ensures that the project is owned and adopted by the users once it is completed.

(iii) Social and Political Implications of PFM Systems. Implementation of computer-based systems to support PFM requires an understanding not only of the business processes and information requirements, but also of the social, cultural and political environment of the organization and the country within which they are being implemented (Walsham, Symons, and Waema, 1988). It has been argued that computer-based systems are social systems
in which technology is only one of the elements. The organizational
arrangements required to ensure a "social fit" therefore take on increasing
importance.

As an example of the social and political implications of PFM systems,
officials in operational departments (such as taxation or accounting) who are
responsible for ensuring that all transactions pertaining to their areas are
processed speedily and recorded in their books, would normally encourage
the installation of computer-based information systems to make their jobs
easier. However, installation of computer-based information systems
would also add transparency and thus accountability to government
operations. There may be situations where this would not be considered
totally desirable and could lead to impediments in project implementation.
This is another reason why PFM systems projects would need a sponsor at
the highest levels who could overcome the social and political constraints
and pilot the project through the initial stages.

(iv) Dependence on Functional Process Reforms. It needs to be reiterated that
the introduction of a network of PFM systems may require fundamental
reforms of the functional processes, such as the introduction of an
appropriate budget classification system that enables costs to be related to
specific programs and projects rather than to aggregate line-item categories.
Computer systems should be viewed as a means to assist the
implementation of re-engineered business processes and procedures. For
example, a computer system can assist in the introduction of a payment
system where the actual payment (such as a check issue) is made an intrinsic
part of the system. Such a system would ensure that all payments are
automatically recorded as they are processed by the system. This would
simultaneously generate accurate data on payments, as opposed to a system
where payment vouchers are processed outside the system and are recorded
ex-post. The latter system would introduce a lag in the timeliness of data,
as well as the possibility that some vouchers were not posted at all, thereby
making the payment data captured by the system incomplete or inaccurate.

(v) Human Resource Issues. The requirements for trained staff to implement
and support government-wide information systems are very considerable
and often grossly underestimated. The technical skills required in the
implementation and support of these systems are rarely present within
government due to long-standing problems of lower salaries compared to
the private sector. Most projects, therefore, rely on external consultants.6
The skill requirements for the implementation of computer-based systems to
support PFM include:

- **High-Level Project Design and Planning Skills.** These include the
  skills and experience required for conceptualizing and designing the
  overall project and subsequently formulating a detailed project plan.
  These skills are the most difficult to come by in most developing
country environments.

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6Some recent Bank projects have adopted a Build Operate Transfer (BOT) strategy for implementing projects with
large information systems components. In these projects the selected contractors would not only be responsible
for the design and implementation of the system, but would also operate it for a period of time (say, 5 years) over
which the government would build up its capacity to take over the systems.
- Project Management Skills. These include the skills required to manage a complex project with a large number of interdependent activities. An important component, is the ability to interface with senior government officials to ensure that project resource and logistical requirements are fulfilled. These skills are often present in local government officials, though they may not be related to the implementation of informatics projects. However, since these officials are much more familiar with the political and other social considerations particular to the environment and since these considerations are very important for successful project implementation, it is highly desirable that project management be entrusted to country officials. If necessary, consultants could assist these officials in an advisory capacity on the more technical aspects. The skills profile required for this position includes an overall knowledge of the business area requirements coupled with good leadership, project management, and interpersonal skills.

- Technical Implementation Skills. These include familiarity and experience in the use of the hardware and software actually used for the implementation of the computer systems. These skills are also not often present within government. However, they may well be available through local consultants or from the private sector. A possible model is to set up a pool of technical experts to assist in the design implementation and support of government computer systems. It may be necessary to use a mix of local and expatriate consultants/personnel in the pool depending on the availability of local experienced staff. The close association between these groups would also encourage transfer of skills and knowledge from the expatriate consultants to local staff.

- User Support Skills. In addition to the technical skills that are required for the design and implementation of computer systems, another area which is at least as important is that of end user support. These include the skills required to provide hot line support, hand holding, and more formal coaching to end users in the use of the systems. This end user support staff would be responsible for providing training to end users in the actual use of the systems to government personnel involved in the PEM business processes. Once these systems are implemented in government, courses in the use of these systems should form part of the normal training required by the finance and accounts personnel and should be delivered through the local training institutions responsible for providing related training.

- Management Training. These include high-level orientation courses for managers in the advantages that computer-based information systems provide for financial resource management in the area of PFM.

(vi) Organizational Issues. An information systems (IS) organization will need to be set up, or existing organizational units strengthened to incorporate the skills mentioned above, to manage the planning, development and operation of the PFM suite of systems.
IS professionals are hard to retain in government in view of the salary structure prevalent compared to the private sector. Any elaborate IS project will, therefore, need to remedy this situation. A number of approaches are possible; for example, grant of special technical allowances, project based financing, etc.

It is likely that IS support will be distributed amongst several agencies across government. It is very necessary that appropriate coordinating mechanisms be created to ensure that a set of policies, procedures, and standards are put in place for managing data (data administration) and systems across government.

(vii) **Infrastructure Requirements.** A number of the systems required to support PFM, described above, would ideally be implemented as an interconnected network of modules at important regional locations, with a central node where all data is consolidated and analyzed. The primary candidates for this configuration are systems that support the tax/custom duties collection processes. However, an essential prerequisite for this type of network is the availability of good telecommunications facilities that can be used for data transfer between the nodes of the network. The degree of stability and sophistication of the telecommunication network often determines the timeliness of the data from the systems network. In most countries, good on-line communications between nodes of a network may not be possible. In these situations, periodic communications between nodes is used to transfer data. If even this is not possible, then data is transferred by off-loading it onto computer-compatible media and transporting the diskettes/tapes physically between nodes.

The stability of the electrical power systems is another major requirement for the operation of computer systems. In most situations it is necessary to use a UPS to ensure that data is not lost when the system comes down on account of power breakdowns.

It is imperative that the hardware and software chosen for the implementation of computer systems can be supported locally. It should be ensured that the vendors have an adequate local presence to be able to provide training and technical support during the life of the system.

I. **Some Country Examples**

16. Many developing country governments have programs in place to improve PFM in general, and supporting information systems in particular. Here we will describe some of these initiatives, on which the World Bank and IMF have cooperated, to see how they fit in terms of the overall information and systems architectures for PFM described above and examine the implementation strategies adopted.

(i) **Public Financial Management Systems in Bolivia.** Computerized information systems, together with administrative reform, regulatory reform, civil service reform, and human resource development, are one of the instruments being used by the government of Bolivia since 1987 to improve the effectiveness of its public sector over a 10 to 15 year period.

Starting in 1987, with financing from numerous ODA agencies (UNDP, USAID, IDB, bilateral assistance from Switzerland and Italy, and the IDA),
the government has been developing several systems to modernize fiscal management according to landmark legislation (SAFCO Law) creating a decentralized financial administration and control system in the country:

(a) *Tax Administration Systems*, addressing primarily the taxpayer registration and tax collection functions. These systems have been quite successful, and measurable expansion of both the taxpayer and the revenue bases can be attributed at least in part to them. However, they use technology incompatible with that of other PFM systems, and produce incomplete data flows to the accounting system.

(b) *Systems for Public Investment Program Budgeting, Management and Financing*. These have had varying degrees of success. The investment budgeting system has been the most successful, and since 1988, produced the country's investment budget submission to the legislature. This system, however, has weak links to external debt management, macro-economic policy formulation, and government accounting. The investment program management system has been less successful, due mainly to lack of efficient data flows with sector ministries and decentralized implementing organizations. Finally, the investment financing system, which in the case of Bolivia would be particularly complex because of the multiplicity of ODA sources, has yet to be developed in full.

(c) *Emergency Program Cash Management System*. Severe fiscal austerity being a major part of Bolivia's successful stabilization program in 1986, a system to track expenses and cash throughout the public sector was an indispensable tool. This system was successfully developed, and for over three years it was the government's main fiscal management instrument. Since it was developed under crisis conditions, however, the system unfortunately lacked data compatibility with other PFM systems.

(d) *Integrated Government Accounting and Payment System*. PFM in Bolivia has been substantially improved already through the installation of this rather successful system. Indepth analysis preceded its development that standardized budgeting, accounting procedures, and coding standards country-wide. The system has not been extended to sector agencies and decentralized institutions, however, and has a number of technical problems, among them its confinement to proprietary technology and its weak links to other PFM systems.

(e) *Expense Budget Formulation and Evaluation Systems*. These are the weakest in the suite of PFM systems. Although coding standards and administrative procedures were rationalized, the actual systems support has been reduced to function-poor software for budget formulation. Implementing agencies do not have access to the system, and MOF staff must travel extensively to help them with budget formulation. Systems support for budget evaluation is even weaker, and devoid of working linkages with investment budget monitoring.
In hindsight, it is possible to conclude that a strategic perspective for PFM systems in Bolivia would have contributed greatly to avoid the following problems:

(a) **Inability to Transfer Information Across Systems.** An information architecture would have allowed incremental development of modules while ensuring that data structures were compatible across systems.

(b) **Incompatible and Proprietary Technology.** With a technology architecture at hand, the government would have had a decision framework for hardware and software choices made for the various systems, and the isolation of the accounting system into proprietary hardware and software could have been avoided. The current four different and incompatible technical environments would have been reduced, and the government would have made the most of the knowledge of scarce technical staff through transfer across core organizations.

(c) **Difficult System Expansion to Decentralized Implementing Agencies.** The clear identification of information requirements and flows provided by an information architecture would have resulted in systems that from the beginning would have pursued the fulfillment of those requirements and flows as a central objective.

(d) **Weak IT Support Organizations.** None of the core agencies involved has IT support organizations and policies commensurate with the importance of the information systems to be developed and maintained. A good strategic plan would have pointed this out and proposed timely remedial action.

This is not to deny the benefits of Bolivia's PFM systems efforts. The new systems streamline, regularize, and speed up key functional areas of government. Additionally, they provide key support to other instruments of public sector reform:

- **Regulatory Reform** is supported through built-in system design features implementing many of the internal control, accounting, and financial management regulations of the SAFCO Law; and

- **Administrative Reform** is supported through the modernization of administrative practices required by the new systems. Decentralized program budgeting – a major administrative reform in Bolivia – was introduced concurrently, and supported by, the new system.

(ii) **Financial and Program Management Improvement Project in Jamaica.** This project was approved in June 1991. The objectives are to support the efforts of government to improve the management of the financial and human resources of the country. The project aims to develop the methodology and procedures for the preparation of an informative budget by defining clearly the objectives and expenditures of government programs, projects, and activities. The program budget would help in clearly defining priorities in allocating scarce funds among competing demands. The project is assisting the government in revising the budget
model in use to program budgeting, designing a standard object code, and adapting the present accounting, cash management, and financial reporting systems to the revised budget model. Particular emphasis would be given to the improvement, timely and accurate compilation, and consolidation of accounts by the spending agencies, and the preparation of the aggregate government accounts by the MOF. The project is also strengthening the personnel management processes of the Ministry of Public Service.

The informatics component of the project is assisting the government to implement:

(a) a Financial Management Information System (FMIS) for the MOF and line ministries to support the budgeting, accounting, cash management, and financial reporting processes; and

(b) a related Human Resources Management Information System (HRMIS) to assist the Ministry of Public Service in the management of civil servants.

The implementation of these systems would provide the MOF, the Ministry of Public Service, and the line ministries with the tools necessary to manage the financial and human resources at their disposal.

In terms of the systems architecture mentioned earlier, this project is focusing on the following areas:

(a) the FMIS which is essentially a system to assist the government in the budgeting, monitoring, and accounting areas; and

(b) the HRMIS that will assist the government in the areas of human resource management.

In terms of implementation issues, earlier experience gained in Jamaica indicated that the project would need to be limited in scope and implemented in a phased manner. It was, therefore, decided that to start with, the project would be limited to the implementation of systems at 11 major ministries. It was also noticed that government agencies prefer to have control over the data they generate and that the telecommunication network cannot be relied on exclusively for the transfer of data between line agencies and central ministries. A highly centralized mainframe-based system located at the MOF and connected via the telecommunication network would therefore be unsuitable in the context of Jamaica. It was decided that computing power would need to be distributed to various government organizational units where the systems are used and could not be restricted to a central site. The FMIS is accordingly being implemented on a series of microcomputer-based networks located at the MOF and line agencies. The computers located at the line agencies would perform all necessary local processing. Data would be transferred to the MOF using the telecommunications systems to the extent feasible. When this is not possible, the data would be transferred periodically on computer-compatible media.

The project intends to use packaged software written using modern fourth generation language application-development tools for implementation of the systems. To overcome the shortage of technical staff required for the
implementation and support of the systems, a pool of computer experts has been set up under the project. This pool is staffed by Jamaican computer professionals and assisted by the expatriate consultants employed under the project. It is hoped that close interaction between the expatriate consultants and local specialists would also encourage transfer of skills to local staff.

To get an idea of the order of magnitude of the effort, it may be mentioned that the project envisages systems implementation to be completed over a three to four year period and the computer component costs are estimated to be about US$6.2 million (of this amount, about $3.7 million is for hardware and software, and $2.5 million for consulting services) out of a total project cost of some US$15.5 million.

In addition to the above initiatives, some other information systems have been put in place under separate projects. At least two debt management systems are in operation; one each in the Central Bank and the Office of the Accountant General. This has resulted in the inevitable problems associated with duplicated systems (for example, numbers from the two systems not agreeing with each other). An elaborate set of systems and associated hardware has been put in place to support several areas in tax administration. The system services the tax administration area quite well. However, some problems have been reported by the MOF of not obtaining adequate data from these systems. It is felt that development of an information and systems architecture at the outset would have partly avoided some of these problems by enabling the systems components to be designed to be compatible with each other and fulfill the government information requirements.

J. Conclusions and Recommendations

17. An information and systems framework as presented in this paper provides a strategic view of the network of PFM computer systems and a model to prepare a country-specific framework which can serve as a roadmap for the country's PFM systems programs. The information architecture identifies a single source and establishes ownership and responsibility for each type of data. It thus simplifies the data collection effort and attacks the critical problem of data duplication. The systems architecture is both a top-down view of the network of information systems and databases needed for PFM, and a roadmap for the implementation work. It is relatively impervious to organizational changes since it is solidly based on analysis of business processes and information requirements of each functional area of PFM. The technology architecture provides the basis to make appropriate technology choices, to guide the process of acquisition of technology, and to ensure integration and compatibility of technology acquired by the various organizations at different times.

18. In most cases, governments will not be able to start the redevelopment of PFM systems afresh, and will need to incorporate a strategic perspective into the existing suite of systems. The following recommendations could permit them to benefit from the strategic, top-down view provided by the information and systems architectures:

- **Gain the strategic perspective:** Develop PFM information, systems, and technology architectures through a short (3-6 months) focused strategic study along the lines described in this paper. Use this as an opportunity to streamline and simplify administrative procedures and rectify any
institutional weaknesses. (For example, changes may be required in accounting policies and conventions and the legal framework governing PFM.)

- **Concentrate resources on priority systems:** Establish priorities for system development by reference to the strategic perspective and by gaining the consensus of key managers in the agencies involved. Examine the current information systems project portfolio and reallocate resources to priority projects. Maintain an up-to-date strategic systems development plan thereafter.

- **Reflect strategic perspective in systems projects:** Modify, to the extent possible, the scope and objectives of priority systems to: (a) unify data sources; (b) support business processes across all organizations affected, not just those sponsoring the system; (c) develop and implement common coding and messaging standards to be used across all systems; and (d) where feasible, migrate to selected technology architecture or develop a migration plan for the future.

- **Fund strategic enhancements to existing systems:** Pool resources and establish a system development fund that government agencies can tap to enhance existing systems according to the strategic perspective and government-wide priorities.
BIBLIOGRAPHY


1.0 Prepare Medium Term Expenditure Plan (MTEP)

Some form of expenditure and resource planning should chronologically, be the first step in the annual cycle associated with public expenditure management processes. The International Monetary and the World Bank increasingly encourage developing countries to prepare a Medium Term Expenditure Plan (MTEP) as part of Adjustment Operations. Policy or project decisions have a fiscal impact extending over several years and these effects are difficult to capture in the short time frame of traditional annual budgets, therefore, a multiyear (3-5 years) time frame is adopted. The MTEP is revised continually and rolled over and extended periodically.

The MTEP provides information on:

- Changes in the aggregates of the government budget, notably revenues, expenditures, and the overall fiscal deficit and its financing.
- Shifts in the balance between the capital and the recurrent components of the budget.
- Shifts in the composition of expenditures by the main sector spending ministries.

The MTEP is based on the following components: A Macro-Economic Framework, A Public Sector Investment Program (PSIP); and a Fiscal Plan. These are described below. (In practice, the rigidity and scope of the medium-term planning exercise varies from country to country.)

(i) **Develop Macro-Economic Framework**

This business process involves developing a macro-economic framework linking the growth of national income, savings, investment, and balance of payments to public expenditures and revenues.

**Data Classes Created:**

*Macro-Economic Framework.* An economic framework linking growth of national income, savings, investment, and balance of payments to public expenditures and revenues.

**Data Classes Used:**

- Δ External Economic Data
- Δ Public Sector Work Program (PSWP)
(ii) **Develop Public Sector Investment Program (PSIP)**

A PSIP shows the investment projects which a government intends to implement over the period of the program. It includes projects at all stages of their life cycle.

PSIP fulfills several functions. It is an instrument of economic management to ensure that macro economic and sector strategies are translated into programs and projects. It is a tool for aid coordination, helping maximize aid inflows, and to channel external resources to priority areas. A PSIP assists public sector financial management, by making it easier to balance commitments with resources. Finally, it strengthens the project cycle by providing a framework within which the preparation, implementation and monitoring of projects can occur.

**Data Classes Created:**

*Public Sector Investment Program (PSIP).* A listing of investment projects which a government intends to implement over the period of the program (3-5 yrs) with possible sources of financing.

**Data Classes Used:**

- Public Sector Work Program
- Fiscal Reports (previous)
- Expenditure Reviews (previous)
- Data on External Borrowings/Grants/Grants in Aid

(iii) **Prepare Fiscal Plan**

Specifically the fiscal plan would include:

- Revenue forecasts at existing rates of taxation consistent with the macro economic assumptions;

- Forecasts of non-tax revenues (surplus of public enterprises, fees, user charges, etc.) based on macro-economic projections but without changes in policy;

- Estimation of additional revenues which may be mobilized by, for example, higher tax rates, a different tax structure, or institutional and administrative
reforms in tax collection;

- Estimation of additional income resulting from changes in the policy framework for public enterprises, public sector pricing policy, charges in the social sector, etc.;

- Estimates of resources available from domestic and external borrowing, and grants; and

- Projections of current expenditure including debt servicing, (both on the existing stock of debt and the prospective future debt) defense, administration, (including the wage bill, operating expenses, and transfers), and recurrent expenditure on development (subdivided between committed and anticipated discretionary expenditures).

**Data Classes Created:**

*Fiscal Plan.* A medium-term rolling plan (3-5 yrs) showing resource mobilization scenarios (forecasts of tax and non-tax revenues, estimates of additional incomes, estimates of resources from external and internal borrowings), and projections of current expenditure.

**Data Classes Used:**

- Public Sector Work Program
- Fiscal Reports (previous)
- Expenditure Reviews (previous)
- Data on Domestic Borrowings
- Data on External Borrowings/Grants etc.
- Debt Service Projections
- Data on Tax Revenues/Collections
- Data on Non-Tax Revenues/ Collections
- Data on Civil Service Complement/Employment/ Benefits

**FUNCTION: Budget Preparation**

2.0 Prepare Budget Estimates

(i) **Make an Initial Allocation of Resources to Agencies and Programs (Based on the MTEP)**

After the MTEP exercise has been completed, the next step in the process is to link the medium-term framework to annual budgeting. On the basis of the estimates of global ceiling for public spending within the budget period, derived from the fiscal forecast, the core agencies make an initial allocation for the CURRENT BUDGET by agency and program. This may be done by using the most recent update of the MTEP to provide the basis for the annual budgetary ceilings for departmental submissions.
Data Classes Created:

*Initial Budgetary Allocations to Programs/Projects.* Resource allocations made by core agencies to programs and projects made at the start of the budget cycle, derived on the basis of the global ceiling for public spending.

Data Classes Used:

Δ Macro-Economic Framework
Δ PSIP
Δ Fiscal Plan
Δ PSWP (previous)
Δ Expenditure Reviews (previous)
Δ Fiscal Reports (previous)

(ii) **Issue Budget Circular Containing Budget Ceilings and Guidelines**

(iii) **Prepare Annual Budget Submissions**

The core agencies send the sector agencies a budget circular indicating economic prospects, broad policy objectives, and how the budget is expected to help attain them. The sector agencies are required to justify proposals for increases and reductions in agency allocations.

In the absence of guidance from the MTEP, the budget circular is restricted to a general statement of resource availability and policy objectives, allowing the sector agencies to respond with their own proposals for allocation.

For CAPITAL EXPENDITURES the sector agencies present proposals for new projects based on criteria indicated by core agencies, including rate of return, availability of financing, implementation capability, and consistency with overall economic and social objectives. A timetable proposes an annual breakdown of expenditures for inclusion in the budget.

Data Classes Created:

*Budget Call Circular.* A circular issued by the core agencies, indicating economic prospects, broad policy objectives, budgetary ceilings, and guidelines inviting line agencies to present programs and projects for inclusion in the budget.

*Line Agency Budget submissions.* Line agency proposals for programs and projects to be executed during the fiscal year.

Data Classes Used:

Δ Macro-Economic Framework
Δ PSIP
Δ Fiscal Plan
(iv) **Prepare Draft Budget**

This business process covers the steps associated with the preparation of the draft budget and the iterations between the Ministry of Finance and the sector agencies prior to the finalization of the budget. Sector agencies respond to the budget circular with their budget requests. Since requests generally exceed resources, negotiations between core and sector agency staff at the technical level are required for adjustments, integration and harmonization, and in preparing a consolidated draft document.

**Data Classes Created:**

*Draft Budget.* A draft compilation of the public sector work program based on submissions from line agencies, including data on revenue projections, descriptions of proposed programs and projects, budgetary allocations under capital and recurrent budget heads, and data on status and performance indicators where applicable.

**Data Classes Used:**

- Δ Budget Ceilings
- Δ Budget Guidelines
- Δ Line Agency Budget Submissions
- Δ Expenditure Reviews (previous)
- Δ Macro-Economic Framework
- Δ PSIP
- Δ Fiscal Plan

(v) **Finalize Budget**

After the above process is completed, the final budget is prepared by the core agencies for presentation to the legislature. The final budget is then considered by the legislature. This review can involve several sessions: (a) consideration of the budget framework; (b) examination of detailed proposals at budget committee level; and (c) final plenary session to pass budget into law.

**Data Classes Created:**

*Approved Budget.* The final budget arrived at after extensive discussions with line agencies and consideration by the legislature, containing data on revenue projections, approved programs and projects, status, performance indicators; approved budgetary allocations under the capital and recurring budget heads.
3.0 Implement Budget

(i) Prepare Expenditure Plans

(ii) Prepare Cash Flow Forecasts

Sector agencies are required to prepare forecast of cash requirements over the year based on known and anticipated commitments for both recurrent and capital expenditures. These forecasts highlight information on inescapable commitments and the foreign-exchange component of anticipated expenditures. These are consolidated at the Ministry of Finance.

Data Classes Created:

Expenditure Plans. Line agencies projections of expenditure based on planned programs and projects.

Cash Flow Forecasts. Forecasts of cash requirements over the year based on known and anticipated commitments for both recurrent and capital expenditures.

Data Classes Used:

△ PSWP
△ Expenditure Reviews
△ Fiscal Reports
△ Fiscal Plan
△ PSIP

(iii) Release Funds to Agencies

The Ministry of Finance administers payments to sector agencies so as to ensure adequate control over the flow of expenditures. The MOF releases funds (issues warrants) to sector agencies based on the cash flow forecasts or periodic releases based on the approved budget. The sector agencies are required to prepare monthly/quarterly requests and actual expenditure statements for the previous month/quarter. Capital expenditure
warrants are allocated to specific projects. At times supplementary warrants are required to be issued to meet unanticipated expenditures or to meet the balance of commitments which could not be covered by the earlier warrant. There may be separate warrants for recurrent and capital budgets.

**Data Classes Created:**

*Budget Warrants.* Warrants issued by MOF authorizing periodic release of funds to sector agencies within the budgetary allocations.

**Data Classes Used:**

- Approved Budget
- PSWP
- Cash Flow Forecasts
- Expenditure Reviews
- Fiscal Reports
- Fiscal Plan
- PSIP

(iv) **Receive Budget Authorization and Execute Programs and Projects**

(v) **Procure Goods and Services**

(vi) **Pay for Goods and Services**

On receipt of moneys from the MOF, sector agencies initiate work on the implementation of programs and projects for which they had requested budget allocations. The activities associated with this process include the normal management activities associated with the development, design, planning and implementation of work programs and projects envisaged in the budget estimates.

The actual process of procurement of goods and services maybe decentralized to the sector agencies. In these cases, core agencies are responsible for establishing uniformity in contractual procedures to ensure as many competitive bids as possible. Sector agencies administer the procurement process including advertising detailed cost evaluation, evaluation of bids, negotiation with contractors, and review of contractors performance.

In other cases a Supply Division, often associated with the MOF, acts as the government's purchasing agent and is responsible for ensuring that goods and supplies are provided speedily and at least cost.

In both cases it is necessary to institute systems to assist and monitor the procurement process including the various stages viz requisitioning, ordering, receiving, warehousing and inventory control in addition to the accounting aspects discussed above.

As programs and projects get underway agencies start utilizing appropriated funds by paying for goods and services required for their programs and projects. In the sequence of administrative steps, the first step of spending agencies towards utilization of these funds is to place orders for the goods and services needed during the year. Such orders, which result in incurring obligations, can be placed at any time during the fiscal year. The next stage in the administrative process is the acquisition of goods and services.
After works are completed or services rendered, bills are received. Spending agencies verify and issue payment orders. The agency's finance department, which is functionally responsible to the central MOF, processes the payment orders and issues instrument of payment or makes an entry in a deferred payment account. As checks are issued these entries exit from the deferred payment account. Finally, checks are received and cashed by vendors and suppliers.

Data Classes Created:

*Procurement Transactions.* Data on requisitions, purchase orders, contracts, receiving reports relating to the procurement of goods and services.

*Payment/Receipts Transactions.* Data on commitments, expenditures and payments and receipts made during the execution of programs and projects over the course of the fiscal year.

Data Classes Used:

\[\Delta\] Approved Budget
\[\Delta\] PSWP
\[\Delta\] Expenditure Authorizations

(vii) **Request Budget Adjustments/Supplementary Allocations**

Transfer of appropriations from one budget category to another and supplementary allocations are other important activities during the budget implementation process. Authority for budget transfers or virement varies with the type of transfer. Thus, for example, budget transfers between major budget head may only take place after authorization by the MOF. Transfers at other levels may be allowed (with exceptions) to agency managers. Supplementary allocations are made by the core agencies.

Data Classes Created:

*Budget Transfers/Virements.* Data on changes in budgetary allocations based on work program priorities and funds availability.

Data Classes Used:

\[\Delta\] Approved Budget
\[\Delta\] PSWP
\[\Delta\] Expenditure Authorizations
Authorize Expenditure and Implement Expenditure Controls

This business process occurs in parallel with the business processes associated with budget preparation and implementation. The main stages of expenditure controls are summarized below:

- During the budget preparation process government policies and actions, formulated at the highest ministerial levels in the core, the sector agencies and the parliament, ensure that budget allocations conform to desired social and economic policies.

- At the stage of releasing funds, the core agencies monitor overall cash availabilities and program/project priorities.

- In the budget implementation process, expenditure controls play an important part. In practice, sector agencies may institute a system of commitment planning and control to ensure that (a) the expenditure does not exceed the sums approved by parliament for specific purposes; and (b) that expenditure is contained within the amounts released periodically by warrants (the instrument that controls the availability of cash). This system also assists the core agencies in cash management by identifying inescapable and priority commitments for which cash has to be made available at specific periods during the year. Examples of inescapable commitments would be statutory payments such as public debt, staff salaries and allowances, unpaid bills brought forward, and existing contractual obligations.

- At the stages of preparation of payment voucher/issue of payment order, internal control is performed by the accountants attached either to spending agencies or to the MOF and is performed after the commitment but prior to payment. At the stage of issuing a payment order, several of the above processes could be repeated and could include the following verifications: the identity of the spending officer; the availability of budget provisions; the exact budgetary imputation; verification of the receipt of goods and services; and the observance of financial regularity.

Data Classes Created:

Expenditure Authorizations. Authority for incurring expenditure issued after ensuring compliance with financial rules and regulations, availability of budgetary allocations, and funds to cover the transaction.

Data Classes Used:

 Δ Approved Budget
 Δ PSWP
4.0 Monitor and Evaluate Budget Implementation

(i) Prepare Fiscal Reports

Quarterly fiscal reports ensure that policy makers are fully apprised of significant developments in the public finances and the macro-economic environment. The reports would detail and explain major deviations from the planned budget program and suggest corrective measures that might have to be considered. The reports would also, if necessary, review critically the key economic assumptions made at the time of the budget and the economic outlook for the rest of the year. In practice, sector agencies prepare periodic monthly or quarterly progress reports and accounts which are consolidated and annualized by the core agencies. Comprehensive, up-to-date and accurate information is essential in the budget execution process to enable the core financial agencies (Budget Division and the Treasury) to monitor the actual flow of spending or use of appropriations (warrants) over the course of the year. A reliable flow of statistical information at regular and frequent intervals is necessary if core financial agencies are to determine whether the budget execution process conforms to the intended aggregates.

Data Classes Created:

Fiscal Reports. Periodic reports to monitor the overall flow of spending or use of appropriations over the course of the year highlighting major deviations from the planned budget program and suggested corrective measures.

Data Classes Used:

\[ \Delta \text{ Approved Budget} \]

\[ \Delta \text{ Public Sector Work Program} \]

(ii) Monitor and Evaluate Budget Implementation

(iii) Monitor Progress on Agency Programs and Projects

On the basis of the information provided by the sector agency and overall fiscal reports, core agencies carry out: (a) periodic review of actual expenditures; (b) analysis of variations with budgetary estimates; (c) analysis of budgetary lags; and (d) matching financial and physical progress and reallocation of funds where necessary.

In addition, monthly monitoring arrangements to suit project/activity managers at different levels are necessary. Moreover, the details ought to be provided for different category of managers (cost center, activity, program, etc.) may vary, so that the data provided may have to be modified to suit different users.
Data Classes Created:

Expenditure Reviews. Periodic reviews of actual expenditures, analysis of variations with budgetary estimates, and comparisons of financial and physical progress; consisting of overall budget reviews and agency reviews of programs and projects.

Data Classes Used:

Δ Approved Budget  
Δ Public Sector Work Program  
Δ Fiscal Plan  
Δ PSIP  
Δ Macro-Economic Framework  
Δ Fiscal Reports

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**FUNCTION: Cash Management**

5.0 Monitor Cash Flows and Expected Cash Requirements; Issue and Redeem Government Securities

This business process involves monitoring monthly cash flows and expected cash requirements, and is aimed at managing the government's cash resources and providing short term financing for shortfalls in cash during the year through issue of treasury bills and management of the timing of bond issues.

This business process caters primarily to the requirement to minimize the cost of borrowing and idle balances, and to provide spending agencies with adequate but not excessive finances to fund their spending programs.

Because of defects in the system, or with a view to escaping surveillance as much as possible, line agencies often prefer to generate special funds over which they have control rather than return cash to a central pool. This can lead to a situation in which core agencies are forced to borrow to meet the government's day-to-day cash requirements at a rate of interest higher than that earned on the line agencies cash surpluses deposited with the commercial banks.

Data Classes Created:

Liquidity Position. Status and forecasts of cash requirements and availabilities.


Data Classes Used:

Δ Cash Flow Forecasts  
Δ Fiscal Reports  
Δ Expenditure Reviews  
Δ Data on Domestic Borrowings
6.0 Manage Public Debt (Domestic and External)

(i) Float Domestic Loan Offerings

(ii) Account for Receipts

(iii) Project Debt Service Requirements

(iv) Service Debt

The business processes would maintain records on all contracted debt on an individual loan basis, and classified according to source and type of loan.

The Accountant General's Office in the MOF (Treasury) is normally responsible for servicing the public debt, both domestic and external. This office arranges to issue checks for payment of interest and repayment of principal. It maintains a copy of all external loan agreements signed by the MOF and all local loan flotations.

In addition to processing payments, this process would also assist in economic and policy analysis by determining, for example, debt implications of different fiscal and deficit financing policies by preparing projections of debt service commitments under existing contracts, and for additional borrowing under specified terms and conditions.

Data Classes Created:

Data on Domestic Borrowings. Includes records on all contracted debt on an individual loan basis, disbursement and repayment transactions relating to these loans, and data on debt service projections.

Data Classes Used:

Δ Fiscal Plan
Δ PSIP
Δ Fiscal Reports
Δ Expenditure Reviews
Δ Data on Issues and Redemptions of Government Securities Approved Budget
Δ Public Sector Work Program
7.0 Manage Foreign Aid

This process has two components: (a) Aid Coordination – Matching of aid resources to PSIP requirements; and (b) Aid Management – Disbursement of and Accounting for Aid Funds.

(i) Coordinate Aid Inflows

The planning agency normally coordinates aid programming, matches aid agencies to projects, and oversees the process of project negotiations. The MOF, however, is responsible for the actual signing of the agreements.

Data Classes Created:

*Data on External Borrowings/Grants/Grants-in-Aid.*
Includes records on all external debt/grants/grants-in-aid on an individual loan basis, debt service projections and data on physical performance of programs, and projects for which the loan/grant has been given.

Data Classes Used:

- PSIP
- Fiscal Plan
- Approved Budget
- Public Sector Work Program

(ii) Disburse and Account for Aid

The MOF has the responsibility for the disbursement of and accounting for aid funds and meeting subsequent loan repayment requirements. In principle total public resource use, including all aid flows, should be considered both for the medium-term macro-economic implications and for setting priorities for resource allocation. In practice the inadequacies of countries' PEMS, have led to situations where aid agencies have bypassed the MOF. While this trend may have been necessary to secure the implementation of aid funded projects, it is necessary to ensure that government is involved in the sanctioning expenditure, and these expenditures are recorded in government accounts.

Data Classes Created:

*Data on Foreign Aid Disbursements/Repayments.*
Disbursement and repayment transactions pertaining to external borrowings.

Data Classes Used:

- Approved Budget
- Public Sector Work Program
- Data on External Borrowings/Grants etc.
8.0 Administer Government Revenue Collection Systems

(i) Administer Tax Revenues and Tax Collection Systems

This business process deals with the administration of the tax policies enunciated at the center, and covers the actual levy and collection of revenues including taxes, duties etc. as laid down in these policies. Separate departments/directorates are responsible for collection of the various forms viz Custom Duties, Income Tax, VAT, etc. These departments often report to a Central Board of Revenue.

**Data Classes Created:**

*Data on Tax Revenues/ Collections.* Includes data on tax policies, tariff rates, and actual collections for each category of revenue broken down by period. Includes all transactions related to tax collections with associated details.

**Data Classes Used:**

- Δ Macro-Economic Framework
- Δ Fiscal Plan
- Δ Approved Budget

(ii) Administer Non-Tax Revenues and Associated Revenue Collection Systems

This process covers the valuation and collection of other non-tax revenue systems such as stamp duties, user fees/charges for services products supplied by the government. This process is carried out by the agencies responsible for the supply of these services.

**Data Classes Created:**

*Data on Non-Tax Revenues/Collections.* Includes data on service rates and actual collections for each category of service broken down by period. Includes all transactions related to non-tax collections with associated details.

**Data Classes Used:**

- Δ Macro-Economic Framework
- Δ Fiscal Plan
- Δ Approved Budget
FUNCTION: Accounts Administration

9.0 Administer Government Accounts

(i) Administer Payment and Receipt Systems
(ii) Administer General and Subsidiary Ledgers, and Budget Ledgers
(iii) Account for Fixed Assets
(iv) Account for Inventory
(v) Develop Costs for Programs and Projects

This business process covers the recording and accounting of all government transactions relating to revenues, expenditures, public debt and other (e.g. fixed-asset) financial transactions.

The items involved on the revenue side are tax revenues and non-tax revenues. (These include: fees, administrative charges, sales of services and products, etc.). The items on the expenditure side include both direct and indirect expenditures, loans, grants, and public debt (consisting of both domestic and external debt).

Normally, the following books are maintained: the general ledger, accounts payable, accounts receivable, inventory accounting, cost accounting, and fixed-asset ledgers. These are discussed below.

General and Subsidiary Ledgers. The general and the subsidiary ledgers are implemented at two major levels, at least. First, a central general ledger will normally be maintained by the Treasury or another division at the MOF as the official record of the aggregate budgetary, and asset liability accounts. Second, a general ledger and associated subsidiary ledgers catering to the payments and receipts, and other accounting transactions at the ministries and departments are maintained at these offices concurrently with the central system. The maintenance of the first set of books is normally the responsibility of the Accountant General or the Chief Treasury Officer. The heads of the various ministries and agencies are normally considered to be the chief accounting officers for the second set.

Receipts and Receivables. All government receipts are normally paid into a central consolidated fund (or funds) and any expenditure from that fund must be formally appropriated by the legislature. Often this is an account in the Central Bank in the name of the Accountant General (or Chief Treasury Officer). All revenues flow into this account.

Tax Revenues collected from customs duties, income tax, excise, and land revenue are managed by the revenue collection agencies, and could be lodged in local commercial Banks and then remitted to a central account in the Central Bank. The Central Bank then transfers this money to the consolidated fund. The Central Bank would send a daily report to the Treasury of inflows to the consolidated fund account.
**Non-Tax Revenues** for example from the fees, administrative charges, sale of products (e.g. stamps) are similarly managed by agencies responsible for collection of these revenues and are transferred to the consolidated fund.

**Receipts from Borrowing, Foreign Aid and Loans** floated by the government and inflows of foreign aid are lodged in the consolidated fund. Receipts from borrowing and foreign aid would similarly be handled by agencies responsible for these operations and then summaries posted to the central receipts system.

Payments and Payables. After the budget is approved by Parliament, warrants authorized by the Minister of Finance, are sent to the Treasury or Accountant General (AG) as the custodian of the consolidated fund. The warrant would either authorize the AG to make payments out of the consolidated fund, or authorize the Treasury to make money available for payment by the accounting officers of the administrative ministries by crediting the expenditure clearing accounts of the ministries in the Central Bank.

The request for payments in the administrative ministries originates from the executive side, which after verifying that funds are available in the warrants and the vote, send the bills to the MOF representatives in the Ministry. The latter after checking the correctness of the claim and availability of funds, prepares the checks. The daily lists of checks may then be sent to the Treasury AG. The checks are thereafter released for payment against the balances in the expenditure clearing accounts.

A number of other types of payments are of significance to developing countries. These include items such as payables, pension, interest payments, subsidies, operations and maintenance expenditure, and major contracts.

**Fixed-Asset Accounts.** Systems for fixed-asset accounting maintains records of all government assets and makes provision for the annual valuation and eventual disposal of assets. These systems are specially important for agencies such as the Public Works Department which are responsible for a large stock of assets.

**Cost Accounts.** This includes facilities for accumulation of data on financial resources used in accomplishing a particular purpose, e.g. performing a service, providing a product, or completing a project, etc. This is important in situations where full cost recovery is required for services or products.

**Inventory Accounts.** This includes maintenance of inventory and store accounts.

**Data Classes Created:**

**Government Accounts.** Includes data on all books of accounts, e.g., balance sheets, trial balance, general ledgers, subsidiary ledgers, etc.

**Accounts Receivable Ledgers.** Includes data on all government receipts and receivables.

**Accounts Payables Ledgers.** Includes data on all government payments and payables.
Fixed-Assets Accounts Ledgers. Books of accounts containing data on all government-owned fixed-assets and related transactions.

Cost Accounting Reports. Reports containing data on costs for the various public sector programs and projects.

Data Classes Used:

- Approved Budget
- Public Sector Work Program
- Financial Transactions
- Data on Government Receipts/Receivables
- Data on Government Payment/Payables
- Expenditure Authorizations

FUNCTION: Human Resource Management

10.0 Manage Human resources

This business process along with its subsidiary processes are important from the Public Expenditure Management point of view since the wage bill generally comprises a large fraction of most government budgets. Establishment control has a direct link with budgeting.

(i) Develop Human Resources Strategy and Policies

This business process covers the activities associated with the development and maintenance of the government's long-term human resources strategy and policies, including manpower planning complement control, civil service pay policies, recruitment reward and performance policies, staff conduct rules and procedures, and long-term human resource requirements required to implement government programs and projects.

Data Classes Created:


Data Classes Used:

- Approved Budget
- Public Sector Work Program
- Fiscal Plan

(ii) Administer Civil Service

This business process includes the activities associated with the appointment, promotion, transfers, termination, and staff development actions in accordance with authorized complements for various agencies and associated government policies.
Data Classes Created:

Data on Civil Service Personnel Actions. Data on transactions related to civil service personnel such as transfers, promotions, appointments, etc.

Data Classes Used:

Δ Government Human Resources Strategies and Policies
Δ Approved Budget
Δ Public Sector Work Program

(iii) **Administer Employee Compensation and Benefits**

This business process includes the administration of compensation policy, salary benefit, and entitlement programs including the authorization process for these benefits where applicable.

The payroll system is an important system for the support of this business process. The payroll system will maintain data on payments, benefits, and taxation requirements to ensure timely payment of wage and salaries, and appropriate adjustments in conformity with relevant benefits and tax administrative requirements. The system will link to the central accounting system for allocation of payroll payments to appropriate costing categories. It will also be linked to a personnel management system to provide data for recording and managing staff resources. The Government may operate a central payroll or several systems operated by the respective agencies, with payments being made through their respective clearing accounts.

Data Classes Created:

Data on Civil Service Employment/Benefits. Includes data on pay and benefits admissible, and paid to civil servants.

Data Classes Used:

Δ Data on Civil Service Personnel Actions
Δ Government Human Resources Strategies and Policies

(iv) **Administer Retirement Benefits**

This business process covers the administration of activities associated with retirement. A subsidiary payments system, the pension system will maintain records on all retirees and eligible members of the workforce. It should process all payments and should facilitate forecasting of future year's commitments.
Data Classes Created:

Data on Retiree Benefits. Includes data on pensions and other benefits admissible, and paid to government retirees.

Data Classes Used:

△ Data on Civil Service Personnel Actions
△ Government Human Resources Strategies and Policies

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FUNCTION: Auditing

11.0 Audit Government Accounts

Auditing takes place at two levels. Internal audit at line ministries level during the course of the FY, and external audit by the Auditor General through random checks and on the final accounts for the FY.

Most of the financial statements that the various ministries and departments are required to send to the MOF each month are also submitted to the Auditor General's Office. They provide a basis for auditing of expenditures. Thus the warrants on the consolidated fund are also normally copied to the Auditor General. The Auditor General checks that the sums requisitioned for the various services do not, in the aggregate, exceed the sums authorized.

Within a few months after the end of the FY, the various ministries are required to submit an annual appropriations account statement with explanations on any under or over spending related to their vote on account. The Accountant General then lays before the Parliament, the appropriations account with the Auditor General's comments. In addition to the year end processes, the Auditor General submits audit queries, findings, and recommendations to the various ministries and departments all round the year.

Data Classes Created:

Audit Reports. Data on audit observations on actions and activities of government line agencies.

Data Classes Used:

△ Public Sector Work Program
△ Government Books of Accounts/Ledgers/Transactions
## Business Processes

### Organizational Involvement in Public Financial Management

### Business Processes

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<thead>
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<th>Business Processes</th>
<th>Government Organizational Entities</th>
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* R = Responsible
  * A = Associated

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**Organizational Involvement in Public Financial Management**

**Business Processes**

- Macro Fiscal Planning
  - Develop Macroeconomic Framework
  - Develop Public Sector Investment Program
  - Prepare Fiscal Plan

- Budget Preparation, Monitoring and Control
  - Make Initial Budget Allocations
  - Issue Budget Call Circular
  - Prepare Annual Budget Submissions
  - Prepare Draft Budget
  - Finalize Budget
  - Authorize Budget Adjust/Supplementaries
  - Prepare Overall Cash Flow Forecasts
  - Release Funds to Agencies
  - Monitor Cash Flows
  - Issue and Redeem Securities
  - Prepare Fiscal Reports
  - Monitor/Evaluate Budget Implementation

- Management of the Public Sector Work Program
  - Receive Budget Authorizations
  - Prepare Expenditure Plans
  - Authorize Expenditure
  - Procure Goods and Services
  - Pay/Receive for Goods and Services
  - Request Budget Adjustments
  - Monitor Progress on Agency Progs and Projects

- Debt Management
  - Float Domestic Loan Offerings
  - Account for Receipts
  - Project Debt Service Requirements
  - Service Debt

- Foreign Aid Management
  - Coordinate Aid Inflows
  - Disburse and Account for Aid

- Revenue Administration
  - Administer Tax Revenues
  - Administer Non Tax Revenues

- Human Resource Management
  - Develop HR Strategies and Policies
  - Administer Civil Service
  - Administer Compensation and Benefits
  - Administer Retirement Benefits

- Government Accounting
  - Administer Payment and Receipt Systems
  - Maintain Budget Ledgers
  - Maintain General and Subs. Ledgers
  - Account for Fixed Assets
  - Account for Inventory
  - Develop Costs for Programs and Projects

- Auditing
  - Perform Audits
## Business Processes

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### Annex III

- **C = CREATE** - U = USE
- **Up = Use Previous Years Data**
- **External**

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### Note

- The table above outlines various business processes related to public financial management.
- Each row represents a specific process, and the columns indicate the data classes involved in each process.
- The third column shows the flow of information, with 'up' indicating an upward flow and 'U' indicating no flow.
- The rightmost column lists additional categories such as budget, human resources, and audit.
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