

SUBJECT : Information System Project Management

INFORMATION SYSTEM PROJECT MANAGEMENT

TOPIC: Information systems in business context

SESSION 2

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Introduction

The World Bank and other financial institutions make thousands of loans every year for many different types of projects in developing countries. All of these projects should use project management techniques for effective and efficient implementation, but many do not. **Figure 1** is a list of common project management problems found on international development projects.

- Lack of a shared perception and agreement on the objectives of a project by staff and stakeholders
- Lack of commitment to the project by the team, management, and stakeholders
- Lack of detailed, realistic and current project plans (for the schedule, budget, procurement, resources, and so forth)
- Lack of strong project leadership
- Unclear lines of authority and responsibility
- Lack of adequate resources (personnel, equipment and supplies)
- Organization not committed to, or structured for, project management
- Poor feedback and control processes so that problems can't be detected early
- Poor or no analysis of major risk factors
- Delays caused by bureaucratic administrative systems
 - Delays in approvals
 - Slow decisions in personnel administration
 - Delays in procurement and import of goods
 - Delays in release of funds (especially local funds)
 - Delays in land acquisition

Figure 1: Project Implementation Problems[1]

One of the key problems is the failure to prepare and maintain detailed project plans and schedules. This paper describes the components of a Project Management Information System (PMIS) designed and implemented for a World Bank financed education project in a small island based developing country. The system was based on the MS Access Data Base software and was used for planning, control and reporting purposes.

Introduction | The Context
Five Components of the Project Management Information System
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The Context

Ministries of Education are basically functionally organized bureaucracies involved in mostly day-to-day operational activities. Projects are generally foreign to them and the staff does not have experience with managing large projects. International lending agencies often require these ministries to set up small project management units in a matrix type organization to oversee the implementation of projects that could range in size from US\$10 million to US\$50 million. The average project would have a variety of components including "hard" components like school construction and "soft" components like curriculum development and teacher training.

The World Bank requires certain procedures including semi-annual progress reports. In the past year the World Bank has introduced new requirements to provide greater control over accounting and disbursement called the Loan Administration Change Initiative (LACI). In this project one of the components was training and systems development and the authors worked on a consulting basis to design and install a total Project Management Information System to manage implementation and to meet the new requirements of LACI.

Definition of Requirements

The first step in any systems development effort is to define the requirements of the system. In this case we discovered that a high percentage of the activity on the project was the procurement of a wide variety of products as well as construction of two high schools and development of new curricula and testing systems. Attached, as **Figure 2** is a list of components from the Project Report, which served as the top level WBS for the project.

- Education Project – WBS:
 - Corporate Planning
 - General Administration
 - Curriculum Development
 - Education Materials Preparation

- Education Testing & Measurement
- School Supervision
- New School Construction

Figure 2: List of WBS components from World Bank Report

One key requirement was to develop a critical path based project plan and schedule (CPM) for the entire project. A sample is shown in **Figure 3**.

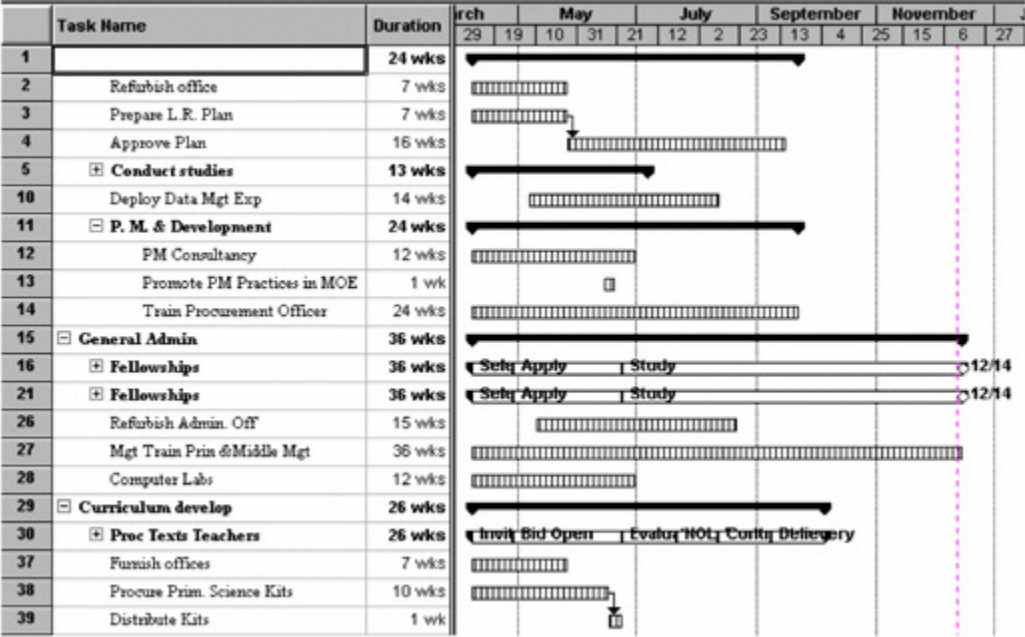


Figure 3: Project CPM Schedule

CPM however excellent for complicated and inter-related activities is not efficient and effective for planning and control of procurement that consists of a series of simple sequential steps. We also identified the training needs and developed a series of training efforts based on these specific needs. Another requirement was to assist the project manager and project team in how to be successful in a matrix type organization with complete responsibility and limited direct authority.

Five Components of the Project Management Information System

Based on the above requirements the consultants developed five modules for assisting the project management team to improve the quality of the information used in management planning, control and reporting. The design principle using rapid prototyping techniques stressed the ease of use, use of existing formats and procedures while requiring the minimum of effort in maintaining the systems. The following paragraphs briefly describe the components that were developed and adopted. Efforts will be made in the future to integrate the components into a single system when the organization's local area network (LAN) is operational. A flowchart of the system is shown in **Figure 4**.

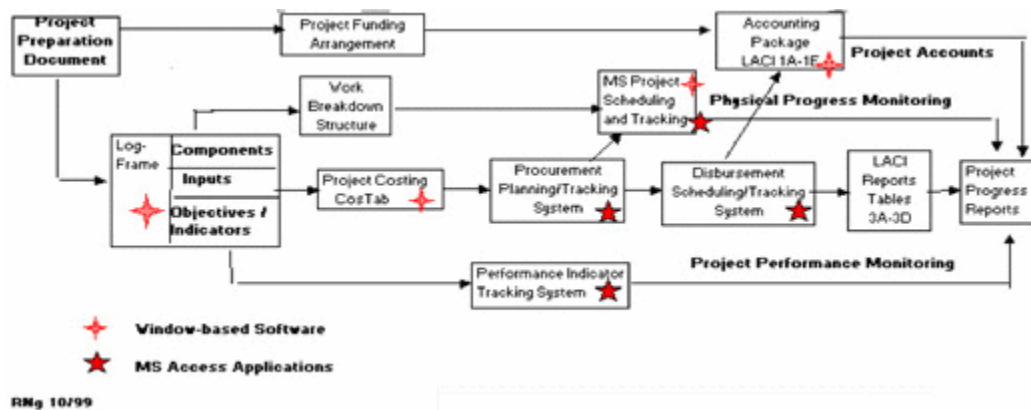


Figure 4: PMIS Flowchart

1. Project Performance Indicator Tracking System

The project managers are required to report to the World Bank the status of each Performance Indicator from the project's Hierarchy of Objectives and management actions taken towards their achievement. The report must be on a semi annual basis and in an agreed format. For the past few years, this report was compiled using a word processor. As the report has a column on comments by the project manager on the status of each indicator, the project manager had to devote considerable time in the production of this report.

The new Project Performance Indicator Tracking System (PPITS), stores the indicators in a database format, and codifies the status into five outcomes: Accomplished Successfully, Being Achieved (on course), Experiencing Minor Problems (being addressed), Experiencing Major Problems and Rescheduling of Target Date Required, and Not Yet Due. With a graphic interface in MS Access, the project manager updates the status of each indicator as events occur, inputs the comments, and records the management actions undertaken. At the

end of each reporting period, the required report is produced automatically (an internal feature of the system) with all the up-to-date information.

2. Procurement Planning and Monitoring System (PPMS)

Procurement is a major part of the project activities. The procurement activity involves a number of discrete steps to be followed in sequence leading from development of specifications through bidding to contract signing with the suppliers who win the bid. The acquisition of goods and services essential to the implementation of the project will be delayed if the timetable of events is not followed. However, in many projects, procurement staffs simply follow the process in a step-by-step manner, finishing one step before tackling the next, with neither systematic planning nor tracking.

A good estimate of when project goods and services will become available can only be done when a contract is signed. The revised list of dates will be automatically updated if a constituent step for any item slips. Since the different methods of procurement for works, goods and services have different steps the PPMS uses different milestones for each type. It also produces a list of procurement activities for a specified time period, thus providing a calendar of all procurement activities required for the next month. This serves as a reminder of critical procurement tasks that the project staff has to perform on a day-to-day basis.

3. Disbursement Planning and Tracking System (DPTS)

With the recent introduction of the Loan Administration Change Initiative (LACI), project management units of World Bank supported projects have to furnish the Bank with accounting reports in a specified format. The tables in these reports require listing disbursements made in each quarter and the forecast of payments for the following quarter. The DPTS is a system designed to enable the planning of the payment schedule of each contract for works, goods and services and entering the dates of actual payments against this schedule. The system automatically analyzes the data and produces the reports in the required format. Together with the Procurement Planning and Monitoring System (PPMS), all the required LACI reports can be produced directly from the database.

4. Procurement Activity Tracking System (PATs)

Apart from the major contracts for the building of new schools and the major consultancies, each project management unit also undertakes a number of relatively small contracts for furnishing the new schools and for purchasing

school supplies. These shopping activities include the following steps: Finalizing the initial specifications; contacting suppliers for price quotations; negotiating specification modifications, discounts and delivery dates; receiving shipments or verifying deliveries in terms of quantities and quality; and authorizing payments by the accountant.

Although the process for procuring an individual item is not complicated, when the number of items required for a particular date becomes large, there is a need for a database to keep track of the status of placement of orders and of deliveries so that suppliers can be paid promptly. Notification of authorization for payment is at present done off line, involving printing a list for payments authorized or passing a diskette to the Accountant.

5. Project Planning and Scheduling System (PP&SS)

A complete critical path based project plan and schedule was developed using MS project. A portion of this plan is shown in **Figure 3**. The first level of indenture is the WBS of the project. The schedule for the items of procurement, transferred from the PPMS, is presented on one line in the CPM chart using the rollup technique in MS Project.

◀ The Context

Implementation of the System ▶

Implementation of the System

The system was designed and implemented in three phases. The first phase was requirements definition, basic training and design of a pilot system using rapid prototyping techniques. The second phase was fine-tuning of the system and on the job training. The third phase was higher-level training and assistance in updating the system after a period of a few months. Some additional modifications were also done at this time.

◀ Five Components of the Project Management

Conclusions

1. A simple Project Management Information System can be very useful in implementing a World Bank project. The discipline of a PMIS assists in avoiding many of the problems listed in **Figure 1**.
2. Procurement activities are better planned and managed using a Data Base Management System rather than a critical path plan and schedule since the activities are completely lineal.

3. Both formal and on-the-job training is needed in addition to systems development. Assistance in entering basic data the first time is also necessary.
4. New project managers placed in a matrix organization need assistance in team building to gain influence without authority in a functional ministry.

The following show additional screen shots of the system.

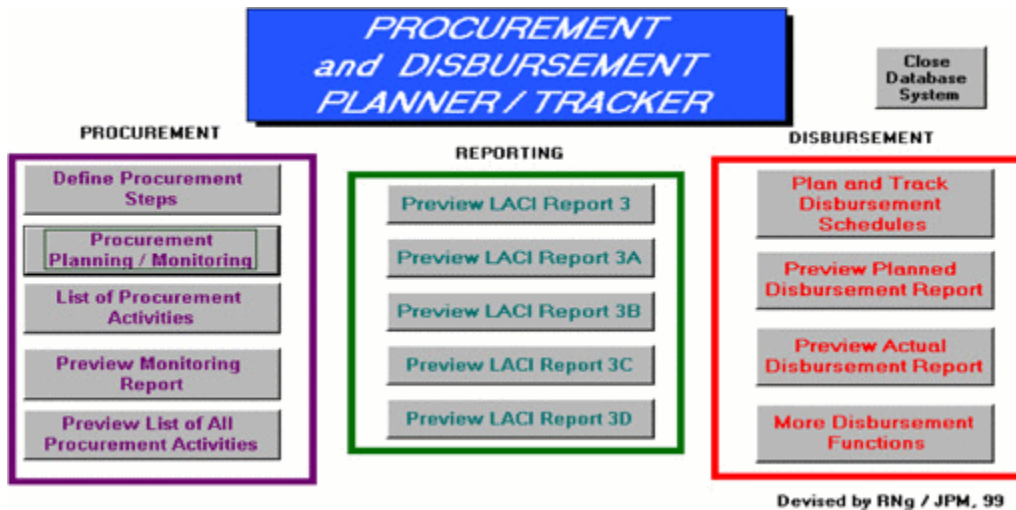


Figure 5: Procurement and Disbursement, Planner and Tracker

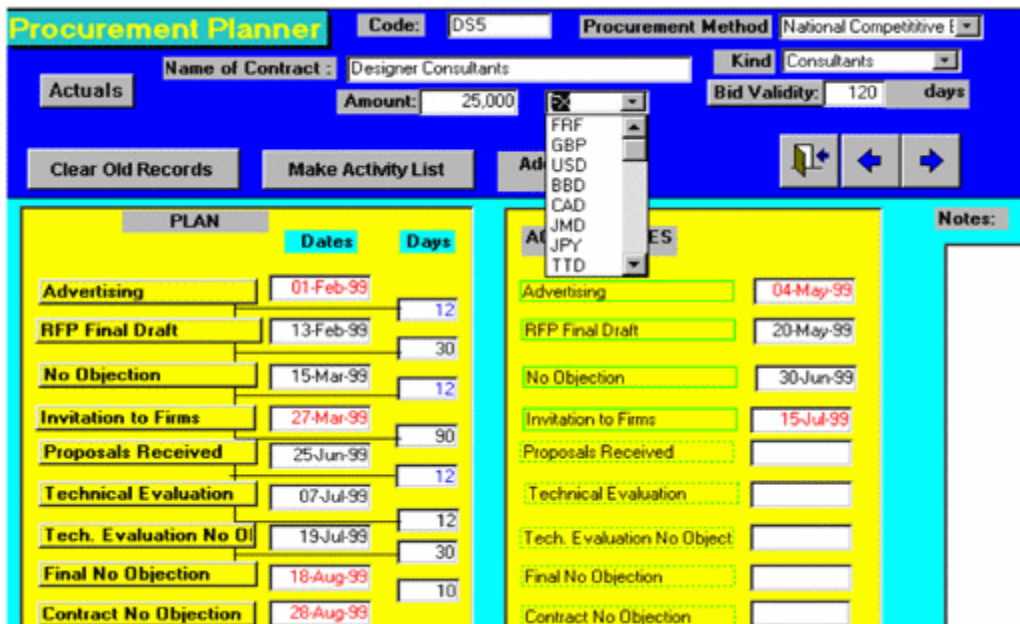


Figure 6: Procurement Planner Input Screen

**Country X: Basic Education Reform Project
Project Disbursement Recording Form**

Make Disbursement Records Add A New Record

Code: CW123 ContractContent: workshop seminar consultants Component: Data Management

ContCommDate: 1/1/99 Fin Source: World Bank ContKind: Services DisCat: Technical Assistance

ContValue: 500000 DisbPerc: 1 DisbValue: \$500,000.00 Supplier: SLITS Nationality:

Payment /Disbursement Schedule:

	Plan		Actual		Notes:
	Date	Amount	Date	Amount	
First Payment	2/1/99	\$1,750.00	2/16/99	\$3,000.00	
Second Payment	3/1/99	\$1,000.00	4/2/99	\$1,000.00	
Third Payment	5/1/99	\$1,000.00		\$0.00	
Fourth Payment		\$0.00		\$0.00	
Fifth Payment		\$0.00		\$0.00	
Final Payment		\$0.00		\$0.00	
Total:		\$3,750.00	Balance:	\$496,000.00	

Figure 7: Disbursement Planner Input Form

◀ **Implementation of the System**

Managing a Project with a Project-Management Information System

Savvy project managers use a project-management information system (PMIS) to keep their projects organized. A PMIS is a set of procedures, equipment, and other resources for collecting, analyzing, storing, and reporting information that describes project performance.

A PMIS contains the following three parts:

- **Inputs:** Raw data that describe selected aspects of project performance
- **Processes:** Analyses of the data to compare actual performance with planned performance
- **Outputs:** Reports presenting the results of the analyses

In addition to requiring that you define the data, designing a PMIS also requires that you specify how to collect the data, who collects it, when they collect it, and how they enter the data into the system. All these factors can affect the timeliness and accuracy of the data and, therefore, of your project performance assessments.

To support your ongoing management and control of the project, you need to collect and maintain information about schedule performance, work effort, and expenditures.

Many information systems have the technical support of computers, scanners, printers, and plotters. But an information system can consist of manual processes and physical storage devices, as well. For example, you can record project activities in your notebook or calendar and keep records of project budgets in your file cabinet. However, you still need to monitor your procedures for collecting, storing, analyzing, and reporting your information; they affect the accuracy and timeliness of your performance assessments.