

# **5 FAM 620 PROJECT MANAGEMENT**

*(TL:IM-32; 01-23-2002)*

## **5 FAM 621 MANAGING STATE PROJECTS (MSP)**

*(TL:IM-32; 01-23-2002)*

a. Project managers should use the MSP method for managing the development of IT projects. This method provides for overall systematic control of the effort (i.e., planning, staff, contractors, budget, progress reporting) throughout the project's life cycle. The MSP method must be used for all IT projects that meet one or more of the following criteria:

(1) Projects with an estimated cost (excluding capital expenditures) of \$500,000 or greater;

(2) Projects that exceed one year;

(3) Projects that are considered by executive management to be highly visible or sensitive;

(4) Projects that require a Memorandum of Understanding with another bureau or agency; and,

(5) Projects that, in the opinion of the project manager, require the formal discipline of a project management method.

b. All projects must have a project manager identified by name.

*c. Project managers may use E-Sign in project development for contract negotiations when official Government forms are used.*

## **5 FAM 622 PERFORMANCE MEASURES**

*(TL:IM-29; 02-04-2000)*

a. Project managers must define performance measures with their project plans. Performance measures are indicators of progress toward achieving goals and objectives.

b. Managers should define objectives in terms that can be quantified. For performance measures to be meaningful and effective, managers must:

(1) Establish baselines against which to measure progress;

- (2) Gather relevant data throughout the year; and
- (3) Track project performance and be prepared to report the results annually upon request from a review board.

c. Project managers should select performance measures that will show progress or the lack of progress for:

- (1) Effective system or product delivery;
- (2) Efficient program administration; or
- (3) A reduction of burden, including information collection imposed on the public or the internal user.

(See 2 FAM 1160 for a discussion of the Department's information collection program, including responsibilities of Department offices.)

## **5 FAM 623 PROJECT TYPES**

*(TL:IM-29; 02-04-2000)*

a. Project managers must determine the project type at the beginning of the planning phase (i.e., study), which analyzes the problem.

b. A project type contains a pattern of characteristics for comparison purposes. Project types are important in helping to accomplish the following:

- (1) Identify the characteristics of a specific project;
- (2) Understand the risks associated with certain types of projects; and
- (3) Provide information on how to plan, tailor, and manage a specific project.

c. The project types listed below represent the types of projects undertaken throughout the Department of State.

### **5 FAM 623.1 Research and Development (R&D)**

*(TL:IM-29; 02-04-2000)*

Research and development (R&D) projects are based on investigation and application of new science and/or technology. Requirements are driven by customer need and new legislation and regulations. The project team examines feasibility or proof of concept. Prototype development is for demonstration purposes only and does not require formal test and verification. R&D projects are considered high risk as success may depend on science and/or technology maturity. Deliverables may be studies or

prototypes to develop further or to increase knowledge.

## **5 FAM 623.2 System Development**

*(TL:IM-29; 02-04-2000)*

Development projects provide systems that are custom built to meet user requirements. Often they use state-of-the-art and/or leading edge technology and design techniques. Performance is emphasized in meeting user requirements. These projects are high risk, as the system has not been previously built. The deliverable is a system with a new design of hardware and software.

## **5 FAM 623.3 Product Integration**

*(TL:IM-29; 02-04-2000)*

Integration projects provide integrated systems that meet unique needs using proven and standard off-the-shelf products and materials. Design effort centers on system engineering, product evaluations, and demonstrations to assess functionality, performance, and interfaces. Hardware and/or software vendors play significant roles. Integration projects contain moderate risk that increases as the need to modify hardware or software increases. The project uses a high percentage of off-the-shelf products and varying degrees of hardware and software content.

## **5 FAM 623.4 System Operations and Maintenance**

*(TL:IM-29; 02-04-2000)*

System operations and maintenance projects are operated and maintained using accepted practices and procedures defined in existing system documentation. After transition to operations, design refinements and their implementation must be rigorously controlled. If a change is significant, a separate project may need to be created to effect the change.

## **5 FAM 624 PROJECT CYCLE**

*(TL:IM-32; 01-23-2002)*

a. The project cycle establishes project goals, provides direction, and encourages teamwork. It consists of periods, phases, and activities. Regardless of the type or development model used, the following are common to any project:

- (1) Benefit and/or cost and requirements analyses;
- (2) Formal review and approval procedures;
- (3) Schedule of activities;

- (4) Standard documentation;
- (5) Quality assurance, and
- (6) Configuration management.

b. The MSP project cycle consists of three distinct periods: study, acquisition, and operations, which are explained below. The periods, phases, and activities within the project cycle can be tailored depending upon the project's type, size, and complexity (see 5 FAM 625).

c. *Project managers must be familiar with Pub. L. 106-229 (E-Sign) and how it relates to the project life cycle. Refer to 4 FAM 050, Obligation Validity Criteria.*

## **5 FAM 624.1 Study Period**

*(TL:IM-29; 02-04-2000)*

a. Major activities occur within the study period. Define the **what** of the particular requirement, not the **how**, which is defined in the design phase. Study Period activities include, but are not limited to, the following:

(1) Define user and system requirements. User requirements must be linked to the project's mission and IRM goals. User requirements should not be expressed in terms of solutions, but statements of need for specific functions, e.g., output from the system. System requirements can be expressed as attributes (i.e., system function, and usage), constraints (e.g., interfaces, communication protocols) regulatory requirements, and/or specifications (i.e., performance characteristics, interfaces and operations);

(2) Identify risks and assess technical feasibility;

(3) Prepare a benefit and/or cost analysis (BCA). Any project that requires approval of the ITPB or approval by the Capital Planning and Investment Control (CPIC) process must be accompanied by a BCA (see 5 FAM 660);

(4) Prepare a project plan for approval by executive management. Any IT project that requires approval of the MRAG or the TRAG must be accompanied by a project plan that includes goals and objectives, performance measures, resources (i.e., funds and personnel), name of project manager, roles and responsibilities, milestones (i.e., control gates), and completion date (see 5 FAM 616); and

(5) Conduct necessary reviews.

b. Executive management decides whether to commit resources based on the requirement. How the requirement is defined will shape the analyses and decisions of the feasibility study (if appropriate) and subsequent phases of the life cycle. Management also determines whether staff and/or other resources will be devoted to defining and evaluating alternative ways to respond to the identified requirement.

c. The project manager must conduct reviews (i.e., control gates) to ensure that schedules are met and work is satisfactorily completed, and addresses problems that may arise.

## **5 FAM 624.2 Acquisition Period**

*(TL:IM-29; 02-04-2000)*

The acquisition period encompasses the source selection and system implementation phases. Configuration management of all hardware and software items (including documentation) must be in place. Major activities are as follows:

- (1) Develop requirement document(s);
- (2) Prepare request for contract proposals;
- (3) Include acquisition planning and market research data;
- (4) Negotiate contracts;
- (5) Develop preliminary and detailed system designs assembling system items;
- (6) Conduct quality assurance;
- (7) Prepare system for shipment or installation;
- (8) Audit contract deliverables; and
- (9) Conduct necessary reviews.

b. Project managers may procure other products directly (i.e., commercial off-the-shelf software—COTS; government off-the-shelf software—GOTS) during the acquisition period to eliminate or significantly reduce the need for costly and time-consuming development efforts.

## **5 FAM 624.3 Operations Period**

*(TL:IM-29; 02-04-2000)*

a. The operations period encompasses the deployment, operations and maintenance, and deactivation (system retirement) phases. Some

major activities are:

- (1) Installation of a system;
- (2) System or product verification and validation;
- (3) On-site training;
- (4) Final review of documentation;
- (5) Conducting reviews as necessary;
- (6) System operation and maintenance; and
- (7) Retirement of a system or product.

b. The decision to retire an IT system must be supported with a benefit and/or cost analysis and should be approved by the system sponsor (see 5 FAM 660). The manager assigned to implement the retirement prepares a plan to remove active support by the operation and maintenance organizations. The plan will include the following:

- (1) Stopping full or partial support after a certain period of time;
- (2) Archiving software products and associated documentation;
- (3) Responsibility for any future residual support issues;
- (4) Transitioning to the new system, if applicable; and
- (5) Providing accessibility for archiving copies of data.

c. The project manager must notify users of the retirement plan and activities as follows:

- (1) Describe replacement or upgrade with its date of availability;
- (2) Explain why the product(s) or function is no longer supported; and
- (3) Describe other support options available, since support has been removed.

d. The project manager should conduct parallel operations of the retirement and new software products, when necessary.

e. When the scheduled retirement date arrives, the project manager must notify all concerned and archive all associated development documentation, logs, and code in accordance with records disposition schedules. These schedules are established by the Department's Records Management Office (A/RPS/IPS) and approved by the National Archives. Data used by or associated with the retired system will be made accessible

in accordance with existing security and privacy regulations.

## **5 FAM 625 PROJECT TAILORING**

*(TL:IM-29; 02-04-2000)*

a. Project managers must tailor the project based on type, unique characteristics, and complexity factors (i.e., size, costs, schedule constraints).

b. Project managers should eliminate tasks and data that add unnecessary costs or that do not add value to the activity or product. Projects may be tailored as follows:

(1) Delete unnecessary phases, tasks, control gates, and documentation;

(2) Alter phases to more explicitly reflect the application; and

(3) Add tasks, control gates, and documentation as needed.

c. Project managers should use those periods, phases, activities and/or products, and control gates that will establish a logical sequence for the development strategy or implementation that will yield successful results.

## **5 FAM 626 SYSTEM IMPLEMENTATION**

*(TL:IM-29; 02-04-2000)*

a. Implementation strategies determine the most logical approach for implementing project findings that are arrived at during the acquisitions period (see 5 FAM 624.2).

b. The implementation strategies listed below were originally used in software development and integration environments; however, they can also be applied to almost all types of product delivery.

### **5 FAM 626.1 Waterfall**

*(TL:IM-29; 02-04-2000)*

The waterfall strategy performs the development process a single time. The team simply determines user needs, defines requirements, designs the system, implements the system, tests, fixes, and delivers. The waterfall approach may be used for short-term product delivery, i.e., 3-6 months. The waterfall approach:

(1) Follows structured project management and technology development practices;

(2) Implements a project where the requirements are clear and implementing those requirements are very well understood by both the user and the developer;

(3) Can proceed in progressive stages from requirements, through design, implementation, testing, and operation;

(4) Uses basic techniques in a series of discreet phases, with clear phase termination events and limited feedback between phases; and,

(5) May require massive enhancements during operations and maintenance phases, but the problem and problem solution are relatively stable (e.g., no new technology or budget constraints) over the development period.

## **5 FAM 626.2 Incremental**

*(TL:IM-29; 02-04-2000)*

The incremental strategy determines user needs, defines system requirements, and builds capacity into a planned sequence. The first build incorporates part of the planned capabilities; the next build adds more capabilities, etc. until the system is complete. The incremental approach:

(1) Is used when requirements can be specified up front and the design can be partitioned into prioritized deliveries;

(2) Adds capabilities to, and updates the existing product with each subsequent delivery;

(3) Ends when all requirements are implemented; and

(4) Provides the customer with early use.

## **5 FAM 626.3 Evolutionary**

*(TL:IM-29; 02-04-2000)*

a. The evolutionary strategy also develops a system in builds, but differs from the incremental strategy in acknowledging that the user need is not fully understood and all requirements cannot be defined up front. User needs and system requirements are partially defined up front and refined in each succeeding build. The duration of each cycle should be limited to not more than 3 to 6 months. Each cycle is a mini-waterfall. Evolutionary strategy can be a moving target. The evolutionary strategy should be applied as follows:

(1) When all requirements cannot be specified in advance; and

(2) When the knowledge gained in each cycle is used to generate requirements for the next cycle, and to update the documentation produced in the preceding cycle.

b. The evolutionary strategy ends when:

(1) User needs are satisfied;

(2) The project is transitioned to an incremental approach;

(3) It is determined that the project is not feasible; or

(4) Time and money are exhausted.

## **5 FAM 626.4 Prototyping**

*(TL:IM-29; 02-04-2000)*

a. **Prototyping** develops a working model. It may be used with any development strategy and does not eliminate the need for requirements analysis, design, test, integration, planning and/or status, and documentation.

b. **Rapid prototyping** is usually a software requirements demonstration model that provides a simulated representation of the software system. The code is usually discarded once the model has served its purpose.

c. **Throwaway prototyping** produces models that are built quickly in an unrefined manner, given to the customer for feedback, and thrown away once the desired information is learned. Throwaway prototypes should be built when critical features are poorly understood.

d. **Evolutionary prototypes** are built in a quality manner, are given to the customer for feedback, and are then modified further to more closely define user needs. This process is repeated until the product converges into the desired product. Build evolutionary prototypes when the critical functions are well understood but many other features are not clearly understood.

## **5 FAM 626.5 Information Engineering (IE)**

*(TL:IM-29; 02-04-2000)*

Information engineering (IE) applies management and engineering techniques for planning, analyzing, designing, and implementing information systems. The IE method can be tailored to the project cycle, however, the emphasis is on enterprise wide systems rather than small projects. Information engineering uses computer aided software engineering (CASE) tools to store data, relationships and documentation.

## **5 FAM 627 SYSTEM PRODUCT ASSURANCE**

*(TL:IM-29; 02-04-2000)*

a. Project managers must follow Department product assurance procedures to ensure that project deliverables for IT systems development meet the Department's standards for data administration (DA), quality assurance (QA), and configuration management (CM).

b. A benefit cost analysis (BCA) must be performed and documented for an in-depth analysis of cost comparisons and benefits of projects exceeding \$10M. If the life cycle cost is below \$10M, a simplified BCA is required (see 5 FAM 613, Definitions).

c. Project managers must ensure that all IT systems development projects are implemented with integrity and timeliness.

## **5 FAM 628 AND 629 UNASSIGNED**