

**Part V:
Implement the
Technology**

“Those parts of the system you can hit with a hammer (not advised) are called hardware; those program instructions that you can only curse at are called software.”

— Anonymous



CHAPTER 16 PREPARE AN IMPLEMENTATION PLAN

Chapter 16:

Prepare an Implementation Plan

- What** An Implementation Plan is the *blueprint* that enables project management to define the rules that will guide the project toward completion.
- Why** Failure to conduct implementation planning could lead to missed deadlines, vague responsibilities and, almost certainly, costly change orders.
- Who** The Project Managers (for both the agency and the vendor) work together with the respective Project Teams to form an Implementation Team; the Steering Committee and Executive Sponsor review and approve the Plan.
- When** Implementation planning starts once the Statement of Work has been finalized. If the project kick off is next week, you've waited too long!

This chapter may seem familiar *if you prepared a Project Plan* (as outlined in Part III). An Implementation Plan is merely a variation of the Project Plan that includes new material related to the vendor's obligations. This chapter defines the documents that need to be collected or prepared in order to develop the implementation blueprint, also known as the Implementation Plan.

Creating the Implementation Plan

Did we mention that successful technology initiatives require careful planning? Like the Project Plan that guided the Project Team to this point, the Implementation Plan is the blueprint for *completing* the project. It is different from the Project Plan because your Project Team now has an important new member — the vendor!

Remember: The vendor agreement is also known as the contract, and consists of a primary agreement and a variety of exhibits. See Chapter 15.

Although the primary agreement (as discussed in Chapter 15) includes a Statement of Work and an “initial project plan,” nothing specifically addresses the “who, what, where, when and why” like a solid Implementation Plan that can be used by both the agency and the vendor.

The good news about creating an Implementation Plan is that most of your work should already be done. Creating the plan merely requires that the Implementation Team modify the “Project Plan” that was created in Part III to accommodate the role of the vendor. Therefore, before you begin to craft the plan, you'll need to retrieve two documents: your Project Plan and your vendor agreement.

What to Put in the Plan

The following is a description of the primary elements of a useful Implementation Plan. Remember, each plan is unique, so adding or subtracting elements is normal.

CHAPTER 1: PROJECT SUMMARY	
Overview	This is merely a one-paragraph summary of the project's general scope, timeline and budget.
Deliverables	Look to your contract for the Project Deliverables Exhibit (<i>you do have one, don't you?</i>). Simply cut-and-paste it into this section, which defines what will be delivered and when.
Audit Trail	Use this section to record what has happened and when. Because this will become a living document, it's very important to record when something is scheduled to be complete and, ultimately, when it was completed. Usually, a simple three-column chart will suffice (Who, What, When).
Definitions	All projects have unique terms and acronyms that need to be clearly defined for all members to prevent confusion. You probably already have a glossary in your RFP, so just cut-and-paste it into this section.
CHAPTER 2: PROJECT ORGANIZATION	
Approval Process	In keeping with the concept of planning ahead, this section mimics the Project Plan's approval process, in which the actual approval processes for deliverables are defined. The only difference here is that you must be sure that the approval process for vendor deliverables is consistent with the agreement language. If you're not sure, have your attorney or consultant review the language first.
Organizational Structure	Again, taking the project organizational chart from the Project Plan, modify it to include the vendor's staff.
Relationships	This brief statement addresses the potential use of subcontractors (e.g., your vendor is supplying mobile hardware from a third-party vendor). This section articulates the relationship between the vendors. NOTE: As recommended in Chapter 15, your contract should specify that the primary vendor — not your agency — is responsible for the action and/or inaction by the subcontractor! Be sure this language makes it into the Implementation Plan as well.
Responsibilities	Refer to your vendor agreement for the specific responsibilities of the contractor and the agency. Inserting those responsibilities into the Implementation Plan ensures that project participants without access to the agreement documents clearly understand each party's obligation.

CHAPTER 3: MANAGEMENT PROCESS	
Project Objectives	Include the objectives from the Project Plan.
Assumptions/ Constraints	Include those listed in the Project Plan and supplement the list with any implementation-specific issues (e.g., elected officials impose a new time restriction on the project, change orders up to \$5,000 can be approved without Steering Committee approval, etc.).
Risk Management Plan	The original Risk Management Plan from the Project Plan should be valid and recent, so cut-and-paste it into this document.
Staffing Plan	Describe the numbers and types of personnel needed to conduct the project. Describe the required skill levels, start times, duration on the project, method of obtaining the personnel, training required and phasing out of project personnel.
CHAPTER 4: WORK, SCHEDULE AND BUDGET TOOLS	
Select Contract Exhibits	Take the following sections from the Agreement and insert them into the plan (remember, not everyone has access to the agreement, so this information is helpful to the wider Project Team audience): <ul style="list-style-type: none"> • Project Costs • Payment Schedule • Initial Project Schedule

Yet Another Plan to Maintain

Once the Implementation Team has drafted the Implementation Plan, it goes to the Steering Committee for review and approval, with the Executive Sponsor having final approval/authority.

Similar to the Project Plan, the Implementation Plan will require updates at least once per month (although in the early stages of the project, weekly updates are more appropriate). Generally the Project Manager is assigned to update the Plan and identify any changes to the Steering Committee during regularly scheduled meetings.

Some agencies post the Implementation Plan to an agency Intranet site for widespread communication of the project's status and detail. We encourage agencies that have such resources to take advantage of them (the more eyes the better!).



CHAPTER 17
DEVELOP AND USE QUALITY ASSURANCE
TESTS

Chapter 17:

Develop and Use Quality Assurance Tests

- What** Quality assurances are actually *tests* that ensure the vendor's hardware and software perform according to specification.
- Why** Failing to conduct any type of quality assurance testing could allow defective hardware or software to be installed at your agency with little or no recourse.
- Who** Depending on the type of test, users, technical support staff, the Project Manager and vendor staff may be involved. The Steering Committee and Executive Sponsor are involved in evaluating vendor/product performance.
- When** The type of test dictates when it is to be performed.

This chapter addresses the key elements associated with identifying and executing the three most common benchmarks used for evaluating the quality of a public safety vendor's products (hardware and software), including: Functionality, Reliability and Performance. Additionally, we have included sample text for use in planning for any of the three testing scenarios. Whenever possible, the content of these tests should be agreed upon by the agency and the vendor during contract negotiations (see Chapter 15).

Quality Assurances and Testing

As the name implies, quality assurances (QA) are measurements by which agencies can determine whether or not a vendor's offering meets or exceeds minimum quality standards. In the vast majority of cases, QA is measured by the success or failure of a product as measured against various forms of acceptance testing.

Acceptance testing is the process that an agency uses to verify that the delivered and installed product meets requirements specified in the procurement documents and contract, and is ready for use. From the agency's point of view, this usually means that every user-oriented function should be thoroughly exercised and that any purchased hardware should be free from defect.

A typical test is organized as a *multi-layer script* that guides the tester through a series of data entry/retrieval actions:

- The first layer would seek to verify that the major functions are properly operating in their most common mode.
- The next layer would seek to test specific modules.
- Lastly, the script may call for the tester to do something very specific, hoping to examine functional specifications.

In the public safety software arena, agencies should employ the following types of acceptance testing:

Note:
Agencies should attempt to include all forms of acceptance testing as elements of the vendor contract.

- **Functionality:** This testing is designed to ensure that the vendor’s software is functioning as described in product literature and, possibly, in their response to the agency’s RFP. Functionality testing usually starts after users have been trained and the software is in a “live environment.” The duration of the test can range from no less than 30 days on up to 90 days, depending on the vendor’s willingness to agree to the agency’s terms during contract negotiations.
- **Reliability:** This testing is designed to determine the “uptime” of a vendor’s solution. Typically, this testing involves the use of special software (e.g., WinRunner, LoadRunner) that simulates the volume of transactions that the vendor claims to be acceptable. Reliability tests can be performed at any time or place, although usually it is best to perform the test on-site after any software customizations have been made to ensure that the “as-built” software conforms with the vendor’s assertions regarding reliability. Reliability testing is often run over a period of 5 to 7 days, with results being extrapolated to simulate a period of 1 year.
- **Performance:** This testing is designed to determine the speed of the combined hardware and software package during various transactions. This involves using scripts that instruct a user to enter various commands, input data, conduct search routines, generate reports and perform other functions while the time it takes to execute the command, task or search is recorded (either by a human with a stopwatch or with approved software). Performance testing is usually conducted late in the project, well after customization and interfaces have been built.

REPORT CARD DAY

Generally, there are three scores a tester can assign: **Pass**, **Fail** or **Reservation**. A “Reservation” score indicates that the system passed the majority of tests within the script, but failed to accomplish 100% of the tested features.

How to Prepare a Test

Aside from outsourcing the preparation of testing materials to a consultant, many agencies start the process by relying upon vendor-supplied test plans. Generally, vendors will provide a “sample test plan” to agencies as a courtesy during the RFP response period, or upon request. This is usually a good starting point, although agencies often have to tighten the pass/fail parameters because the tests are naturally biased in favor of the vendor.

Other options include (a) using the test plans of other agencies that have recently installed and tested the products, or (b) creating your own test plan based on the vendor’s response to the RFP and the vendor’s product documentation. While the latter suggestion is possible, it is both labor- and time-intensive and not recommended for most agencies.

Sample Test Language

Each test plan is unique and can include virtually thousands of testing requirements, making the provision of multiple samples impractical. However, on the next four pages we have included sample testing procedure language for each of the three tests described above. In an actual contract, the text would be followed by actual functional specification tests and scripts, which would naturally be specific to the vendor’s product.

FUNCTIONAL SYSTEMS TEST — SAMPLE LANGUAGE

At least sixty (60) days prior to commencement of the functional systems testing, the vendor shall submit for approval a detailed functional systems test plan based on the general procedures described herein and that shall certify that the desired functionality has been delivered and meets all performance and load benchmarks.

The test plan shall document how each functional specification is to be tested, the method of testing and the anticipated results. This documentation shall describe each scenario to be used for each functional specification. The functional systems test shall be conducted jointly by the agency's Project Manager and designees and the vendor. The functional systems test will:

- Demonstrate every functional attribute of the software, including system software, operating system, utilities, interfaces, system administration procedures, all ancillary application program modules and all management information requirements.
- Verify that all transactions with external systems are performing as specified.
- Test and verify that real-time recovery and switching to the backup system(s) operates as specified by the vendor.
- Conduct full-scale load benchmarks based on scenarios jointly developed with the vendor and approved by agency staff.

The test results shall be included in the test report and the agency's Project Manager or designee shall have the option of conducting an independent test of all or any of the functional requirements, as specified in the Response Document.

Within fourteen (14) days after completion of functional systems testing, the vendor shall provide a written report to document completion of the test, and to indicate test results, problems, solutions and a schedule to implement such solutions. When the operating system, software and interfaces have been delivered, installed and fully tested, including the functional systems test, and the system is ready for reliability testing, the vendor shall provide written certification to the agency's Project Manager that the installation phase of the contract has been fully completed and all requirements have been met.

RELIABILITY TEST — SAMPLE LANGUAGE

The reliability test shall run for a period of thirty (30) consecutive days, twenty-four (24) hours a day for a total of seven hundred twenty (720) consecutive hours after the system is implemented in production mode. This period shall be known as the performance period. During the performance period, the agency shall have the option to run in parallel mode all subsystems that will be replaced by the system until the system is fully accepted. The performance period shall begin on the date the vendor notifies the agency that the system is ready for reliability testing.

If there is a system failure, as defined below, deficits shall be corrected and the reliability test and the performance period shall start over. The following criteria constitute the standard of performance:

The system shall operate in conformance with the vendor's technical specifications and functional descriptions, which shall satisfy the requirements of this proposal at a 100% accuracy level:

- As quoted in the vendor's proposal
- As amended in the contract negotiations
- As amended throughout the design and development stages
- As formally documented

Operation use time and downtime shall be measured in hours and whole minutes. System failure downtime is that period of time during which the scheduled productive workload, or simulated workload, being used for reliability testing cannot be continued on the system due to failure of a software system component. If simulated workload is being used for reliability testing, it shall be consistent with the data processing requirements set forth elsewhere in this contract. Operational use time for performance testing for a system is the accumulated time during which the system is in actual operation and can be used by the agency.

Downtime for each incident shall start from the time the agency contacts the vendor's designated representative at the prearranged contact point until the system(s) is back in proper operating condition. The vendor shall provide continuous telephone coverage to permit the agency to make such contact. Any single failure or any series of failures of the system software that results in any of the following conditions shall be considered a system failure:

- Complete shutdown of the system. This includes failures that cause human intervention to maintain critical operations or to restart the operating system or server applications software to restore the system function.
- If three (3) seconds is the specified response time, then an increase to nine (9) seconds or longer in five (5) transactions is a system failure.
- An increase in any single transaction response time of four (4) times the response time proposed in the RFP, or longer. For example, if three (3) seconds is the specified response time, then an increase to twelve (12) seconds in one (1) transaction is a system failure.

RELIABILITY TEST — SAMPLE LANGUAGE (CONTINUED)

- Loss of any of the basic system functions, such as the inability to transfer event messages between workstations, loss of the use of all communication functions, or the inability of the system to maintain folder status or event status on a current basis.
- Loss of all or a major part of the mobile functions; loss of the ability to communicate with most or all of the mobile devices.
- Repeated failures of the same function or equipment component is unacceptable even if it does not cause the conditions listed above for a system failure.
- More than two incidents of downtime per week for the same problem.
- Any critical entry or information control capability is not available at all active workstation positions.
- The loss of the ability of the system to communicate (in either direction) with agency systems, interfaces, data sources.

During the reliability test period the system shall be fully available, in excess of seven hundred sixteen (716) hours, i.e., a total of four (4) hours or more of downtime (unavailable time) shall be considered system failure.

The agency shall maintain appropriate daily records to satisfy the above requirements and shall notify the vendor in writing of the date of the first day after the successful performance period. The date of acceptance shall be the first day after the successful performance period. If the system fails to meet the standard of performance after ninety (90) calendar days from the installation date or start of the performance period, whichever is later, the agency may at its option request a rescission of the contract and request the immediate removal of the system. The impact on prior payments of such a rescission shall be determined in contract negotiations.

PERFORMANCE TEST — SAMPLE LANGUAGE

All files and tables shall be capable of being updated online without adversely affecting performance or degrading response time, as described below. The system shall provide the option of batch updates for all files and tables in addition to the online updates described above. All necessary backups shall be able to be done online without adversely affecting system operations, and without lockouts for updates. The system shall provide the option of cold backups in addition to the online backups described above.

Appropriately formulated queries to interfaced databases shall be made without adversely affecting system performance, i.e., asynchronous messaging capabilities. Such inquiries shall not tie up or lock up the workstation.

The vendor shall provide the exact transaction response times for the proposed system, based on the network and hardware requirements proposed in the RFP. These shall be used as the basis for the response time testing and acceptance. Response time for data retrieval shall be measured from the point of issuing the request (pressing the enter key) to displaying the record to the client.

The following method shall be used to measure response time: A representative mix of system transactions based upon the peak daily loading from field operations, normal processing, records operations and mobile computing activities shall be entered into the system for a period of twenty (20) minutes via an automated product such as Mercury Interactive Corporation's product "Load Runner" or its equivalent. The vendor shall provide software to measure and print out transaction response times. The response time shall be measured under peak workloads and meet or exceed the following:

TRANSACTION	CRITERIA
Mean response time	7 seconds
Simple queries	3 seconds
Complex queries	10 seconds
Document retrieval request	7 seconds
Concurrent transactions per second	50
Transactions per minute	3,000

Capacity and Growth: The initial system software configuration shall be expandable to handle an anticipated increase of workload comparable to the expected growth rate for the agency of 10% for each of the five (5) years following implementation. This expansion shall allow the system to maintain the specified system performance requirements, including response time.

System Availability: The system shall provide overall system availability (uptime) of 99.5%, excluding planned downtime.

Use Test Results to Evaluate Vendor and Product Performance

Following the actual testing process, agencies must evaluate the performance of the vendor and its product(s), seeking to determine whether or not the vendor successfully passed the various tests. Usually, agencies withhold acceptance of the technology until after the vendor's products have passed the testing phase (remember, acceptance is linked to payment; thus, vendors have a shared interest with the agency in successfully executing the testing process).

The Project Manager should work with the Steering Committee to interpret QA test results. The Steering Committee is responsible for reaching a formal evaluation decision regarding the vendor/product performance and making recommendations to the Executive Sponsor regarding system acceptance/nonacceptance. Final acceptance authority rests with the Executive Sponsor.

What's Next?

- Undertake Project Closeout and Recurring Tasks Chapter 18
- Manage, and Comply With, Your Grant Award Chapter 19

PART V ASSIGNMENTS

EXECUTIVE SPONSOR

- Role**
1. Ultimate decisionmaker
 2. Provide oversight and guidance

- Implement the Technology Tasks**
1. Approve Implementation Plan (Chapter 16, page 209)
 2. Based on outcomes of Quality Assurance (QA) testing and Steering Committee's recommendation, determine whether to accept/withhold acceptance of technology (Chapter 17, page 220)

STEERING COMMITTEE

- Role**
1. Evaluate post-implementation vendor and product performance
 2. Provide knowledge and recommendations

- Implement the Technology Tasks**
1. Review and approve Implementation Plan and continual updates (Chapter 16, page 207)
 2. Using QA test results and staff input, formally evaluate the performance of the vendor and its products (Chapter 17, page 220)
 3. Report acceptance/nonacceptance recommendation to Executive Sponsor (Chapter 17, page 220)

PART V ASSIGNMENTS, CONTINUED

PROJECT MANAGER

- Role**
1. Coordinate and oversee all tasks and activities
 2. Work closely with vendor
 3. Seek input of City/County attorney and project consultant (if any) as needed
 4. Advise Executive Sponsor, Steering Committee and other players on implementation issues

- Implement the Technology Tasks**
1. Organize an Implementation Team, comprised of staff from the vendor and agency Project Teams; start implementation planning (Chapter 16, page 207)
 2. Gather documents needed to prepare the Implementation Plan (Chapter 16, page 207)
 3. Organize and oversee regular meetings of the Implementation Team as it drafts and updates the Implementation Plan (Chapter 16, page 209)
 4. Oversee Implementation Plan approval by decisionmakers (Chapter 16, page 209)
 5. Post the Implementation Plan to your agency Intranet (Chapter 16, page 209)
 6. Determine appropriate QA testing procedures, oversee testing, help interpret QA testing outcomes and report to decisionmakers (Chapter 17)

PART V ASSIGNMENTS, CONTINUED

IMPLEMENTATION TEAM (A SUBSET OF THE PROJECT TEAM)

- | | |
|---------------------------------------|--|
| Role | 1. Create the Implementation Plan |
| Implement the Technology Tasks | <ol style="list-style-type: none"> 1. Create the Implementation Plan document, modifying the Project Plan to accommodate the vendor's role (Chapter 16, page 208) 2. Participate in regular meetings to draft and continually revise the document (Chapter 16, page 209) |

TECHNICAL STAFF

- | | |
|---------------------------------------|--|
| Role | 1. Participate in QA testing |
| Implement the Technology Tasks | <ol style="list-style-type: none"> 1. Assist with QA functionality, reliability and performance testing, focusing particularly on the performance of hardware and software (Chapter 17) 2. Provide advice and expertise to staff and decisionmakers (Chapter 17) |

OPERATIONAL EXPERTS (USERS)

- | | |
|---------------------------------------|---|
| Role | 1. Participate in QA testing |
| Implement the Technology Tasks | <ol style="list-style-type: none"> 1. Assist with QA functionality and performance testing, focusing particularly on exercising user-oriented functions (Chapter 17) 2. Provide advice and expertise to staff and decisionmakers (Chapter 17) |