Implementation Guide

Best Practices for Quality Assurance of Product Development in the Lottery Industry

Version 1.1, October 2007

NASPL

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Best Practices for Quality Assurance of Product Development in the Lottery Industry

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Document Number: IG0601

Published by The Open Group, October 2007.

Comments relating to the material contained in this document may be submitted to:

nsi-specifications@opengroup.org

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Preface

North American Association of State and Provincial Lotteries (NASPL)

The NASPL Standards Initiative (NSI) was approved and funded by NASPL and the vendor community as a collaborative development effort with participation from the lotteries, gaming vendors, and retail associations. Project management and facilitation services for standards development and validation are provided by The Open Group in conjunction with NASPL.

The NSI vision is to provide an interoperable lottery environment that is based on a set of open Technical Standards, approved Best Practices, Certification and Verification programs that, when implemented, will further the quality and integrity of the lottery environment, and will provide increased efficiencies, resulting in reduced costs and increased profit margins for lotteries, vendors, and lottery retailers.

The NSI mission is to establish a resilient organizational structure, set of processes, and procedures that will engage all constituents (lotteries, vendors, and retail representatives) in an environment of open discussion and cooperative development.

Further information about NASPL is available at www.naspl.org.

The Open Group

The Open Group is a vendor-neutral and technology-neutral consortium, whose vision of Boundaryless Information Flow™ will enable access to integrated information within and between enterprises based on open standards and global interoperability. The Open Group works with customers, suppliers, consortia, and other standards bodies. Its role is to capture, understand, and address current and emerging requirements, establish policies, and share best practices; to facilitate interoperability, develop consensus, and evolve and integrate specifications and Open Source technologies; to offer a comprehensive set of services to enhance the operational efficiency of consortia; and to operate the industry's premier certification service, including UNIX certification. Further information on The Open Group is available at www.opengroup.org.

The Open Group publishes a wide range of technical documentation, the main part of which is focused on development of Technical and Product Standards, Best Practices, and Guides. Full details and a catalog are available at www.opengroup.org/bookstore.

Readers should note that all published NSI Technical Standards and Best Practices, and any updates, in the form of Corrigenda, are available at www.opengroup.org/naspl/published.

1 Introduction

1.1 Purpose and Scope

This document is the Implementation Guide for the Best Practices for Quality Assurance (QA) of Product Development in the Lottery Industry.

It has been developed to aid lotteries and vendors in the implementation of the following three Best Practices:

- QA: Requirements Definition (Vendor and Lottery Practices)

- QA: Development Process (Typically Vendor Practices)

- QA: Acceptance Testing (Lottery Practices)

This collective group of QA Best Practices offers a set of processes and procedures that address the quality assurance requirements throughout the hardware and/or software production cycle from requirements specification through design, implementation, and testing, to acceptance and deployment. The scope of these Best Practices, although general enough for many software or hardware production environments, has some quality assurance aspects that are specific to the lottery industry.

The applicability of these Best Practices extends to all areas of software and/or hardware production for the lottery industry, including:

- Production of a new lottery system

- Creation of new software and/or hardware components for use in an existing lottery environment

- Updates or extensions to existing lottery system components

1.2 About This Document

The structure of this document is as follows:

- Chapter 1: Introduction

  This section introduces the document and describes the purpose and scope of the Implementation Guide.

- Chapter 2: Why Implement the QA Best Practices?

  This section addresses the business rationale and operational issues that are driving the implementation of the QA Best Practices.

Best Practices for Quality Assurance of Product Development in the Lottery Industry

- Chapter 3: How to Implement the QA Best Practices

    This section provides a guide for practitioners who will be responsible for implementing the QA Best Practices.

- Chapter 4: Certification/Verification Process

    This section looks at what comes after the Best Practices have been implemented, with a focus on moving toward formal certification/verification; that is, NSI Verification for lotteries and NSI Certification for vendors.

- Chapter 5: Contact Information

- Appendix A: Best Practice Templates

2   Why Implement the QA Best Practices?

The major business drivers for implementing the Best Practices for Quality Assurance of Product Development in the Lottery Industry are the potential for reduced risk and increased integrity for the lotteries, reduction in development costs, decreased potential for lost revenue, and decreased rate of project failure. These business drivers are summarized below:

- **Liability**: The potential for liability issues exists if faulty software or hardware is installed. The types of conceivable issues depend on the type of software or hardware being installed, but issues could include large dollar liabilities in the case of incorrect tickets being generated or paid. Even with the protection of rules and regulations, which attempt to limit the liability issue, legal issues will still arise and may ultimately be successful. Preventing problems by following Best Practices for quality assurance before deployment will help prevent the costs after the fact.

- **Lost revenue**: This business driver is associated with the costs to the business in terms of lost sales or productivity when the system or supporting networks are down or performance is poor, in the retail environment or at the lottery central office.

- **High costs associated with fixing problems in the field**: Development time and costs are decreased if problems are discovered and resolved during testing in the development or acceptance cycle rather than after installation and deployment in the field.

- **Public relations and loss of integrity**: Public relations problems can result from the installation of defective software or hardware systems in the lottery or retailer environment. Any problem a lottery incurs that becomes public has the potential for negative consequences and negative publicity, which can ultimately turn into concern on the part of the public about the integrity of the lottery.

- **Loss of initiative**: When a new program initiative fails, the impact often extends beyond that of the current initiative. For example, if the software implementation of a game change goes badly, a lottery may be reluctant to run other games of a similar type or to introduce other new types of games. This can result in a lottery having a lower risk tolerance for introducing other innovative programs in the future.

3　How to Implement the QA Best Practices

3.1　Read the Best Practice

The Best Practices for Quality Assurance of Product Development in the Lottery Industry were developed within the NSI Best Practices Working Group and were subjected to a wide review open to all NASPL lotteries and NSI vendors. Following the review, they were approved by the NSI Steering Committee, ratified by the NASPL Executive Committee, and published in April 2004.

In order to implement the Best Practices correctly, you must read them. In particular, you should become very familiar with Chapter 4 of the applicable QA Best Practice, which can be found at www.opengroup.org/naspl/published. The requirements specified in Chapter 4 of the Best Practice must be adhered to as part of conformance to the Best Practice. It is important to note that all of the prescriptive terms found in that chapter must be interpreted according to the definitions in Section 1.3 (Terminology) of the Best Practice.

For quick reference purposes, there is a Requirements Checklist in Appendix A of each QA Best Practice. The Requirements Checklist contains a summary of all of the requirements listed in the Best Practice, each with a reference to the specific section in the Best Practice where the requirement is specified in greater detail, and each indicating which constituent is responsible for meeting the requirement as well as the level of prescription associated with the requirement.

3.2　Incorporating the Best Practice

This section contains a roadmap on how to implement the Best Practice. It is a guide and not necessarily mandatory, but will help with correct implementation of the Best Practice within your organization. Practitioners should refer to the Best Practice to understand what the mandatory requirements are. Practitioners may choose to explicitly follow the steps as outlined in this guide, or they may choose to combine them or do them in a different order depending on their particular circumstances. For example, some practitioners will already have in place procedures, templates, and working methods that will merely need to be updated to reflect the Best Practice; others may need to create these from scratch. The approach to implementing the Best Practice may also be influenced by where an organization currently is in the lifecycle of activities defined by the Best Practice. Regardless of a practitioner's current state of readiness, following all the steps as written in their entirety in the order stated will provide a deterministic roadmap to successful implementation of the Best Practice.

3.2.1　Familiarization and Commitment

This is the starting point to implementation; it is very difficult to implement requirements that are not understood or to which staff may object on the basis of "that's not how we do things here".

All staff that will be responsible for operating under the Best Practice should familiarize themselves with the content of the Best Practice. It is unlikely that each individual will understand every requirement initially. There are recourses that can help with this. Team meetings will help to ensure common understanding, as it is possible that a requirement which may appear obscure to one individual is clear to another. A group discussion at this stage can help to establish common ground for the changes that will need to be made to implement the Best Practice and can feed into the next stage in the process – the Gap Analysis.

Most importantly, the familiarization exercise should be used to identify any requirements that need explanation or clarification. The first resource to be consulted should be the Best Practice FAQ (see Section 3.3). If an issue remains, then the next resource is the Best Practice support contact at nsi-specifications@opengroup.org. It is far more efficient for all concerned – both the practitioner and the Certification Authority – when a requirement can be implemented correctly the first time. Spending the time to fully understand the Best Practice before starting to implement it is likely to save time overall by avoiding the need for rework.

Finally, at a team meeting it will be necessary to remove roadblocks to implementation. Many of us become fixed in the way we approach our work and can be resistant to change. For the implementation to be a success, everyone responsible for operating in accordance with the Best Practice needs to be committed to it. This may mean certain customs and practices have to be abandoned or modified. It is the business practice manager's responsibility to ensure that all staff affected by the Best Practice are committed to making it work within their organization and in their day-to-day work.

3.2.2 Gap Analysis

The gaps are the differences between the way things have been done, and are currently done, and the requirements of the Best Practice. A gap may be a requirement of the Best Practice which is handled some other way, is only partly met, or may not be addressed at all in the current practice.

It is recommended that a current project, and/or a recently completed project, be used as the basis for the gap analysis. The gap analysis is an internal, informal method to establish to what extent the Best Practice is currently applied, and to what extent existing custom and practice must be changed to implement all the requirements of the Best Practice. If there is anyone within the practitioners organization who has experience or training in quality assurance, those individuals may be the most appropriate to undertake the gap analysis. However, anyone with project management experience should find little difficulty in completing it.

Requirements Checklist as a Tool for Gap Analysis

Gap analysis is most readily approached by a compliance matrix between each Best Practice requirement on the one hand, and the project procedures, plans, specification, records, and general documentation on the other.

Fortunately, the Requirements Checklist, found in Appendix A of each of the Best Practices, can form the basis of this matrix and has already done the job of deconstructing the Best Practice into a set of discrete stand-alone requirements.

For each requirement listed in the Requirements Checklist, the practitioners should determine which of the following categorizations apply:

1. **Compliant**: The practitioners believe that the processes they normally use do comply with the Best Practice requirement and they have documents and records in which the requirement is instantiated.

2. **Partly-compliant**: The practitioners believe they meet the spirit of the requirement but they omit some of the detail or they do it in a slightly different way.

3. **Non-compliant**: They do not do it.

In addition, for every requirement the practitioner should determine if:

1. It is realized in planning documentation and/or standard templates.

2. It is realized in project records.

Finally, the practitioner should note the status of each requirement marked partly-compliant or non-compliant.

- If the status is "must", then this is a deficiency that has to be corrected for the organization's implementation of the Best Practice to be compliant.

- If the status is "should", then the practitioner should treat this as a strong recommendation to implement; however, if the practitioner has a compelling reason to use an alternative method of meeting the requirement, this will not necessarily be a barrier to compliance in the future. It should be noted, though, that rationale such as "at the moment that requirement may just not be the way it is done in custom and practice" is not in itself a compelling reason to depart from the Best Practice.

- If the status is "may", then implementation is optional and the practitioner might want to decide if implementation is desirable or not.

By methodically going through each requirement in this way, it should be possible to identify the areas where the Best Practice is not currently followed and whether there are documented processes or templates that need to be created or modified to ensure that the Best Practice is followed in future projects.

3.2.3 Underlying Quality Assurance System (QAS)

It is not enough that specific requirements of the Best Practice are implemented on one project; they must be implemented in each and every project subject to the Best Practice. Each practitioner should determine the way it wishes to implement the Best Practice that is most suitable for its particular circumstances, organizational structure, and day-to-day work. Many requirements can be implemented in equivalent but diverse processes; however, regardless of how you choose to implement, it is recommended, for ease of repeatability, that there be a set of documented underlying methods, processes, and templates that you can use across all projects and over time.

In many organizations this planning documentation is know as a documented Quality Assurance System (QAS) and that is how it will be described in this document from now on. However, no

matter how it is referred to within each practitioner's organization it is a set of plans which explain how to implement the Best Practice across multiple projects to ensure that the implementation is:

- Repeatable from project to project over time

- Reproducible, irrespective of who actually does the work

If the practitioner already has a documented QAS in use in its organization, this stage will be a matter of reviewing and changing it to bring it into line with the Best Practice. If the organization has no such system, this stage is the creation of such a QAS.

In creating a QAS that is designed to meet the Best Practice requirements, the following major areas should be considered:

- Templates

  To implement a long-term documented QAS that addresses the Best Practice requirements on every project, practitioners may want to consider creating templates to be used as starting points for each project. One very straightforward way to do that is to map, where applicable, the template headings and text directly to the Best Practice requirements.

  As a starting point of what templates might be appropriate for each Best Practice, the practitioner should refer to the Documentation Checklist that is in Appendix B of each of the Best Practices. Appendix B not only indicates what documentation is required, but whether the creation and maintenance of each documentation piece is a shared responsibility or a sole responsibility of the vendor or the lottery.

  Please note that an individual practitioner may wish to incorporate internal process requirements and material in the templates that go beyond the requirements of the Best Practice and this is acceptable and may be desirable.

- Sequencing

  Frequently, a Best Practice will identify a specific time or sequence associated with a requirement. It is important that the practitioner be aware of those so that the timing requirements are consistently met.

  The best way to plan effectively for this is for practitioners to capture these time-dependent requirements, both through text in the templates and through customized milestone dates that account for the prescribed sequencing in the appropriate document.

- Sign-off and responsibility

  There are some components of the Best Practice that are designated as shared or sole responsibilities of either the lottery or vendor. The Requirements Checklist in Appendix A and the documentation requirements and responsibilities in Appendix B offer a quick look at who is responsible for what. In addition, many times a Best Practice will require that certain components (e.g., acceptance criteria) should be formally reviewed and receive sign-off approval from both the lottery and the vendor.

  One of the most effective ways to assure that these responsibilities and sign-off requirements are not forgotten and are met across all projects over time is to incorporate

them as requirements and milestones in the templates, and in the case of sign-off requirements, to couple them with explicit signature pages associated with each of those areas as a reminder to practitioners.

By focusing on the above-mentioned areas, the practitioner should be able to create or revise a documented QAS that fully reflects each and every mandatory requirement of the Best Practice as well as those non-mandatory requirements that the practitioner has chosen to implement.

The next stage is to carry out the project work in accordance with the documented Quality Assurance System. It follows that if the documented Quality Assurance System completely and correctly instantiates all the requirements of the Best Practice, all the work done in the project will be compliant with the Best Practice. It is simply a matter of following the processes, procedures, and methods and utilizing templates for all the documents and other project records that are required by the Best Practice.

In an ideal world, the practitioner might like to complete all the planning work on the documented Quality Assurance System and then introduce it at the start of the next project. In practice, the work to define the documented Quality Assurance System may only be completed after a project lifecycle is well underway or may even be produced in parallel. In such circumstances the practitioner may wish to accelerate the implementation of the Best Practice by applying it in the midst of a project lifecycle.

At the completion of this stage the practitioner may want to repeat the gap analysis from scratch to ensure that every Best Practice requirement is realized in the documented quality assurance system.

3.2.4 Specific Implementation Guidelines

There are many approaches to implementing Best Practices. The previous section provided guidelines for implementing an underlying QAS targeted toward those practitioners who have not yet implemented the Best Practice or who have partially implemented it but are looking for additional guidance in achieving compliance or maintaining compliance over time.

This section aligns with the principles of having an underlying QAS in place but focuses more on how to implement the Best Practice requirements with an eye to being ready to apply to the formal validation program. This section provides specific documentation and tool references for each of the QA Best Practices:

- QA: Requirements Definition

- QA: Development Process

- QA: Acceptance Testing

3.2.4.1   QA: Requirements Definition

The objective of the QA Requirements Definition Best Practice is to implement the processes by which requirements are defined, documented, agreed, and approved by the lottery and the vendor, and to identify the specific types of information that need to be specified during Requirements Definition.

Practitioners should familiarize themselves with the Best Practice for QA of Product Development in the Lottery: Requirements Definition, which can be found at www.opengroup.org/naspl/uploads/40/5092/BP0401.pdf.

Documentation Requirements

There are certain documentation requirements, which can be found in Appendix B of the QA: Requirements Definition Best Practice. That section illustrates what documentation will be required and which party (lottery or vendor) is responsible for maintaining it. In some instances there will be a shared responsibility and it is up to the lottery and vendor to work closely together.

Appendix B will also provide a good indication of the templates that should be created if the practitioner was to tie the Best Practice requirements back into their QAS.

For example, at the time of this writing the Requirements Definition has several pieces of documentation listed in Appendix B:

- Requirements Specification

- System Design

- User Interface

- Project Planning, including Quality Assurance Planning

- Acceptance Criteria

It is up to the practitioners to ensure that the documentation exists and that it meets all of the requirements of the Best Practice. Not all of the documentation pieces necessarily need to be separate documents; some can be sections within a document.

For example, the practitioners could decide that the way they will construct their documentation for the Requirements Definition would be to have two separate documents:

1.   Requirements Specification (which in addition to meeting all of the requirements associated with the Requirements Specification would also contain the System Design and User Interface and meet all the requirements associated with those as well)

2.   Project Plan (which in addition to meeting all of the requirements associated with Project Planning would also contain the Acceptance Criteria and meet all the requirements associated with those as well)

Template Considerations

If there is already a QAS in place that employs the use of templates, then use them and don't re-invent the wheel. If you have a template that already meets the Best Practice then don't attempt to create the documentation from scratch – you will most certainly miss some of the requirements. If you do not yet have templates in place, then use this opportunity to create them and make them a part of your QAS for future use.

As mentioned, one very straightforward way to create templates for each project is to map, where applicable, the document/template headings and document/template text directly to the Best Practice requirements.

For example, if the practitioners chose to construct their documentation in a way that reflects the example in the previous section they would then develop documents that mapped directly to the Best Practices Requirements and which could then later be used as templates.

As an incomplete but illustrative example, a Project Plan Template if mapped directly to the Best Practice requirements might start out something like the following:

Master Project Plan

This is the master project plan for the <Name of Project>.

The Project Manager from <The Supplier Organization> is <Name and Contact Information>.

The Project Manager from <The Lottery> is <Name and Contact Information>.

The person/company responsible for maintaining this project plan is: <person/company>.

This Master Project Plan can be referenced by both lottery and vendor. In addition, the vendor organization and the lottery organization may each maintain their own project plans. The lottery's internal project plan is <Name of Plan>.

The Project Schedule:

Milestones, Dates, Deliverables:

Dependencies and Time Constraints:

…

The Acceptance Criteria:

The Acceptance Criteria for the Alpha Phase is as follows: <include text that addresses all of the Best Practice requirements>

The Acceptance Criteria for the Beta Phase is as follows: <include text that addresses all of the Best Practice requirements>

The Acceptance Criteria for each phase must be signed off by the vendor and lottery prior to the start of the development <signature page>

…and so on, continuing to map each of the Best Practice requirements that apply, to the headings or text in the required set of documentation.

Sequencing Considerations

The QA: Requirements Definition Best Practice has several requirements that have a specific time or sequence associated with them. It is important that the practitioner be aware of those requirements so that the timing requirements are consistently met.

For example, in the QA: Requirements Definition Best Practice it currently states that:

- Sign-off approval on the Requirements Specification should occur prior to the start of the Development Process.

- Acceptance Criteria will be defined and agreed during Requirements Definition, prior to the start of any development work on the project, and will be used to determine whether or not the product is acceptable.

Sign-Off and Responsibility Considerations

The QA: Requirements Definition Best Practice requires that certain components be formally reviewed and receive sign-off approval from both the lottery and the vendor. For example:

- Requirements Specification

- System Design

- User Interface

- Acceptance Criteria (where they are defined for different phases of the project)

In addition, lotteries should check in the Best Practice or in the Requirements Checklist to see where requirements are shared responsibilities and work with their vendors to fulfill them.

Critical Considerations

It should be understood that although these sections in the Implementation Guide provide suggested methodologies and examples, they are to be considered guidelines and incomplete examples and not as prescriptive or all-inclusive. The Best Practice document always takes precedence and is the authoritative reference for all Best Practice requirements.

3.2.4.2   *QA: Development Process*

This section defines the Best Practice for the Development Process used by the vendor. Although this Best Practice primarily applies to and is written in reference to the vendors who are creating IT products for the lotteries, it should be noted that in the context of this Best Practice, the term "vendor" applies to any constituent in the role of product developer and in particular can be applied to lotteries who are engaged in in-house development of lottery technology and applications, and to third-party application vendors.

Development is the process by which the vendor produces the product to be delivered to the lottery. In order to assure the quality of the resultant product, the vendor should ensure that they are applying the Best Practice. To apply this Best Practice, a vendor will need to have development processes and procedures that are being used within their organization, have documented them so they are able to be deployed across the relevant parts of the organization, and have established mechanisms to ensure that development activities are performed in accordance with the organization's defined and documented processes.

The purpose of this Best Practice is not to suggest that a vendor use a specific development model or set of tools, but rather to utilize their chosen model and tools in accordance with this Best Practice.

Practitioners should familiarize themselves with the Best Practice for QA of Product Development in the Lottery: Development Process, which can be found at www.opengroup.org/naspl/uploads/40/5103/BP0402.pdf.

Documentation Requirements

Documentation requirements can be found in Appendix B of the QA: Development Process Best Practice. That section illustrates what documentation will be required and which party (lottery or vendor) is responsible for maintaining it. In some instances there will be a shared responsibility and it is up to the lottery and vendor to work closely together.

Appendix B will also provide a good indication of the templates that should be created if the practitioner was to tie the Best Practice requirements back into their QAS.

For example, at the time of this writing the Development Process has several pieces of documentation listed in Appendix B:

- Internal Test Plan

- Test Summary Report

- List of open defects and issues

- Definition of acceptance test environment

- Release Plan & Release Notes

- Integration Plan

- Installation Guide

It is up to the practitioners to ensure that the documentation exists and that it meets all of the requirements of the Best Practice. Not all of the documentation pieces necessarily need to be separate documents; some can be sections within a document.

In addition to the specific project documentation identified above, the vendor must have documented product development processes and procedures. The process documentation must cover the following:

- Detailed design process

- Implementation approach

- Internal testing process

- Change control management process

- Problem reporting process

Template Considerations

Typically, software/hardware development organizations will already have a documented Quality Assurance System in place, and will not be implementing one from scratch, but will instead be adapting their current system to comply with the Best Practice where it does not. As previously stated, practitioners can determine where their current Quality Assurance System does or does not meet the Best Practice requirements by first doing a gap analysis using the Requirements Checklist.

Typically, vendors will have templates that they use in their own QA processes for product development, and instead of creating from scratch will focus on how to adapt their existing templates to align with the Best Practice requirements. Again, the best method is to adapt existing templates is include headers and text that map to the Best Practice requirements.

Sequencing Considerations

The QA: Development Process Best Practice has a few requirements that have a specific time or sequence associated with them. It is important that the practitioner be aware of those requirements so that the timing requirements are consistently met.

For example, in the QA: Development Process Best Practice it currently states that:

"The Acceptance Test Environment will be reviewed during the Acceptance Test Readiness Review."

Vendors should be aware of these requirements during project lifecycles and include them in templates for future projects as well.

Sign-Off and Responsibility Considerations

The QA: Development Process Best Practice requires certain shared responsibilities and sign-off reviews or approvals. For example:

- Integration Plan: This must be approved by both lottery and vendor.

- Acceptance Testing Authorization: Authorization of handover from development to acceptance testing must come from the lottery; if not ready both vendor and lottery must agree what steps are required to be approved for acceptance testing.

Vendors should be aware of these requirements during project lifecycles and include them in templates for future projects as well.

In addition, vendors should check in the Best Practice or the Requirements Checklist to see where requirements are shared responsibilities and work with their lotteries to fulfill them.

Critical Considerations

It should be understood that although these sections in the Implementation Guide provide suggested methodologies and examples, they are to be considered guidelines and incomplete examples and not as prescriptive or all-inclusive. The Best Practice document always takes precedence and is the authoritative reference for all Best Practice requirements.

3.2.4.3   *QA: Acceptance Testing*

This section defines the Best Practice for Quality Assurance in Acceptance Testing. Acceptance Testing is the process by which the lottery verifies that the product delivered by the vendor meets all of the agreed requirements, and thus is acceptable for deployment in the lottery environment. This Best Practice covers Acceptance Testing from test planning, through test execution and acceptance of the product.

Practitioners should familiarize themselves with the Best Practice for QA of Product Development in the Lottery: Acceptance Testing, which can be found at www.opengroup.org/naspl/uploads/40/5104/BP0403.pdf.

Documentation Requirements

There are certain documentation requirements, which can be found in Appendix B of the QA: Acceptance Testing Best Practice. That section illustrates what documentation will be required and which party (lottery or vendor) is responsible for maintaining it. In some instances, there will be a shared responsibility and it is up to the lottery and vendor to work closely together.

Appendix B will also provide a good indication of the templates that should be created if the practitioner was to tie the Best Practice requirements back into their QAS.

For example, the QA: Acceptance Testing Best Practice has several pieces of documentation listed in Appendix B:

- Acceptance Test Plan
- Test Scripts
- Test report from acceptance test execution

It is up to the practitioners to ensure that the documentation exists and that it meets all of the Best Practice requirements.

Template Considerations

If there is already a QAS in place that employs the use of templates, then practitioners should use them and don't re-invent the wheel. If practitioners do not yet have templates in place, then they should use this opportunity to create them and make them a part of their QAS for future use.

As mentioned, one very straightforward way to create templates for each project is to map, where applicable, the document/template headings and document/template text directly to the Best Practice requirements.

Sequencing Considerations

The QA: Acceptance Testing Best Practice has a few requirements that have a specific time or sequence associated with them. It is important that the practitioner be aware of those requirements so that the timing requirements are consistently met.

For example, in the QA Acceptance Testing Best Practice it currently says that:

"The Acceptance Test Environment will be reviewed during the Acceptance Test Readiness Review – lotteries and vendors should be aware of this requirement."

The best way to plan effectively for this is for the practitioner to be aware of these time-dependent requirements and to capture them both through text in the templates and through customized milestone dates that account for the prescribed sequencing in the applicable piece of documentation being used in the current project.

Sign-Off and Responsibility Considerations

The QA: Acceptance Testing requires that certain readiness states or components must be reviewed or signed-off by certain parties. For example:

- At the completion of Acceptance Testing, the lottery Quality Management must sign-off on the testing to formally accept the system components as meeting the contracted requirements.

- The Acceptance Test Plan must be reviewed with the vendor.

Lotteries should be aware of these requirements during project lifecycles and include them in templates for future projects as well.

In addition, lotteries should check in the Best Practice or the Requirements Checklist to see where requirements are shared responsibilities and work with their vendors to fulfill them.

Critical Considerations

It should be understood that although these sections in the Implementation Guide provide suggested methodologies and examples, they are to be considered guidelines and incomplete examples and not as prescriptive or all-inclusive. The Best Practice document always takes precedence and is the authoritative reference for all Best Practice requirements.

3.2.5 Validation-Ready Steps

In becoming validation-ready, it is helpful for the practitioner to have an understanding of what is required during the certification or verification process as it will help to prepare more effectively for validation. For the QA Best Practices, the current validation procedures call for the evaluation of Best Practices as applied to two projects and the validation process involves three separate assessment components that build on each other and which are described below:

- The **Documentation Assessment** is for the purpose of determining conformance to as many of the requirements as possible based solely on documentation that is uploaded by the practitioner to the certification/verification website. The assessment team will review the submitted documentation and the Applicant Checklist, in which the applicant provides as much information as possible on where in the submitted document evidence can be found to demonstrate that the "must", "should", and applicable "may" requirements are met, in order to support their conformity claims.

- The **Telephone Assessment** typically acts as a follow-on to the Documentation Assessment, and is used to discuss any areas that may need clarification, require additional references, or require additional documentation.

- The **On-Site Assessment** is for the assessment team to meet with the practitioners to resolve any outstanding questions, look at any additional documentation or other project records, and to discuss their overall observations with the practitioners.

This Validation-Ready period is, in a sense, preparation for these future assessments, and during that period, practitioners should be attempting to determine whether they have met the Best Practice requirements and whether they are ready to apply for the formal validation process. One of the best methods for doing that is for practitioners to download the relevant Applicant Checklist, which they will need to submit as part of the validation process, and which can be found at www.opengroup.org/naspl/conformance/docs.

This Applicant Checklist is an efficient way to determine whether a practitioner thinks they are ready for compliance validation, and to begin gathering/referencing the evidence that they will need to supply to support that compliance once they are ready for the formal validation process.

The Applicant Checklist is a matrix, which contains a row for each Best Practice requirement, and with the Column Headings that are listed below. The first four columns contain the same information that is found in the Requirements Checklist; the last four columns are blank and are to be filled in by the practitioner with the document name and the subsection within the document, where evidence of meeting each requirement can be found:

- Requirement Number

- Best Practice Requirement

- Level

- Reference in Best Practice Document

- Project 1: Document in which evidence is found

- Project 1: Reference within Document

- Project 2: Document in which evidence is found

- Project 2: Reference within Document

As the practitioner goes through the checklist to determine whether they think they have met the requirements or not, they should be filling in the last four columns as they go. This will allow them to see for themselves where they have or have not met each requirement, and in addition they will be starting to fulfill one of the first steps in the formal validation process.

Once the practitioners have completed their own Applicant Checklist and feel that they are ready to submit to the formal validation process, they can move forward with the Certification or Verification program (see Chapter 4).

3.2.6 Quality Assurance System Review

To complement the external assessment that will be done during the formal validation process, and ideally as a precursor to it, the practitioner may wish to internally assess the extent to which the documented QAS had been completely and correctly applied, or adapted as appropriate. For example:

- Did the templates work?

- Did they contain information that was aligned with the Best Practices?

- Where do they need to be updated to be more effective the next time around?

It is good to plan in advance how to do a task, but the act of actually doing it may reveal shortcomings in that plan. It is likely that the documented QAS may need revision in the light of experience in one or more complete project lifecycles. By the same token, corners may have been cut with respect to planned processes, procedures, and methods which may have introduced non-conformities with the Best Practice itself.

The purpose of the review is to find any disconnect between the processes, methods, and templates of the documented Quality Assurance System and what happened in practice as evidenced by project records. Such disconnects may then be resolved by rework to the documented Quality Assurance System.

3.3 Corrigenda, Interpretations, & Frequently Asked Questions

Often, during implementation, practitioners will have questions that others have asked before them and for which there is already a response in the Frequently Asked Questions (FAQ) document, which can be found at www.opengroup.org/naspl/conformance/docs/faq.html.

If the questions and answers are not in the FAQ, the practitioner should submit their questions as follows:

- For questions about the Best Practice or Technical Standard:
  nsi-specifications@opengroup.org

- For questions about the certification or verification process:
  naspl-cv-auth@opengroup.org

In addition to the FAQ, it is worth noting that once an NSI Best Practice or Technical Standard has been published, changes may be needed from time-to-time. Change requests may occur when, for example:

- The relevant Working Group raises issues about the Best Practice or Technical Standard.

- An ambiguity or inconsistency is discovered when implementing the Best Practice or Technical Standard.

- The certification process results in approved interpretations against the Best Practice or Technical Standard.

- Changes in technology or operations at the lottery, vendor, or retail sites affect the Best Practice or Technical Standard as it was originally defined.

There is a documented process called the Corrigenda Process for dealing with change requests and updates to the Best Practices and Technical Standards. That process can be found at www.opengroup.org/naspl/published.

It is important that practitioners are aware that this process exists so they can check for any existing updates or interpretations they should know about while implementing the Best Practice, and conversely if they have any questions during implementation, they know there is a process in place for resolution.

It is worth noting that at the time of this writing there have been no updates to the QA Best Practices since their original publication in April 2004.

4 Certification/Verification Process

Once your organization has started implementing the Best Practices, your IT Manager should familiarize him/herself with the certification/verification processes, though of course you will not be able to register for certification/verification until you have completed the implementation and have determined that you are validation-ready.

The first step in the certification/verification process is for the IT Manager to visit the NSI Certification/Verification website at www.opengroup.org/naspl/conformance/cert. All of the NSI Best Practices, Technical Standards, and Certification/Verification Documents are available online and accessible from this website, including: Certification/Verification Policies, Conformance Requirements, Conformance Statement Questionnaires, Certification and Trademark License Agreements, Fee Schedule, Frequently Asked Questions, and User Guides.

The next step in the certification/verification process is to read the Guide to NSI Certification/Verification and the Supplement that applies to the best practice or technology you will be certifying against. These documents should be read thoroughly prior to attempting to certify a best practice or technology as they describe the program and the process in its entirety.

The following documents should be read and understood prior to certification/verification, since you will be required to agree to them during that process:

- The **NSI Certification/Verification Policy and Supplements** define the policies that govern the operation of the NSI Certification/Verification program. These policies define what can be certified, what it means to be certified, and the process for achieving and maintaining certification/verification.

- The **NSI Certification/Verification Agreement** covers the terms and conditions of the certification/verification service.

For more details on the certification/verification process, please refer to the Certification Guide, available at www.opengroup.org/naspl/conformance/cert.

If you have additional questions, please contact the NSI Certification Authority at naspl-cv-auth@opengroup.org.

It is a requirement of certification that at least two projects have been conducted in accordance with the Best Practice and this will form a gating factor as to when the Best Practice can be regarded as being fully implemented. It is strongly recommended that at least two complete project lifecycles be implemented in accordance with the documented Quality Assurance System prior to an application for external assessment.

5   Contact Information

For further general information on the implementation process, please contact either of the following:

- Andy White (awhite@nsaplhq.org)

- Sally Long (s.long@opengroup.org)

For questions about specific requirements of the Best Practice or the certification/verification process, please contact:

- naspl-cv-auth@opengroup.org

A Best Practice Templates

This appendix contains links to best practice templates. These templates are intended to be used as high-level documents to be referenced by both the lottery and the vendor during implementation of the QA Best Practices.

Each template listed below maps to the requirements listed in the Requirements Checklist, contained in Appendix A of the QA Best Practice documents.

Each template is available in PDF and Microsoft Word® format.

Requirements Definition

Refer to Quality Assurance of Product Development in the Lottery Industry: Requirements Definition (Doc. No. BP0401).

- Requirements Specification [PDF | Word]

- System Design [PDF | Word]

- User Interface [PDF | Word]

- Project Planning [PDF | Word]

- Acceptance Criteria [PDF | Word]

Development Process

Refer to Quality Assurance of Product Development in the Lottery Industry: Development Process (Doc. No. BP0402).

- Detailed Design [PDF | Word]

- Implementation [PDF | Word]

- Internal Testing [PDF | Word]

- Acceptance Test Readiness Review [PDF | Word]

- Release Process [PDF | Word]

- Change Control Management [PDF | Word]

- Problem Reporting Process [PDF | Word]

Acceptance Testing

Refer to Quality Assurance of Product Development in the Lottery Industry: Acceptance Testing (Doc. No. BP0403).

- Acceptance Test Plan [PDF | Word]*

- Acceptance Test Plan for Gaming Systems

- Test Script Creation

- Acceptance Test Execution

* Note that the Acceptance Testing Best Practice areas are combined into a single template.