

*Best Practice*

**Quality Assurance of Product Development  
in the Lottery Industry: Requirements Definition**

April 2004

**NASPL**

THE *Open* GROUP

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Best Practice

Quality Assurance of Product Development in the Lottery Industry  
Requirements Definition

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# Preface

## North American Association of State and Provincial Lotteries (NASPL)

NASPL has approved the creation of a standards initiative, which is dedicated to the adoption or creation of Technical Standards, Best Practices, and Certification Programs that will further the lottery objectives of integrity, security, interoperability, and profitability.

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 vendor, and retail associations. Project management and facilitation services for standards development and certification are provided by The Open Group.

The NSI Vision is to provide an interoperable lottery environment that is based on a set of open Technical Standards, approved Best Practices, and Certification Programs that, when implemented, will improve 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.

## 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](http://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/pubs](http://www.opengroup.org/pubs).

## **This Document**

This document is the Best Practice for Quality Assurance of Product Development in the Lottery Industry, specifically addressing Requirements Definition. It has been developed and approved by NASPL in association with The Open Group.

## **Trademarks**

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## Acknowledgements

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# 1 Introduction

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A Best Practice provides a clear description of a set of processes, procedures, and guidelines, that when practically applied to an operation brings a business advantage. A Best Practice has a record of success in providing significant advantage in cost, schedule, quality, integrity, performance, safety, environment, or other measurable factors that impact an organization. Various organizations identify and publicize Best Practices so that others, particularly internal business units, external business partners, or otherwise affiliated external organizations, can benefit from implementing the Best Practice and improving the operation of their business.

Best Practices can be applied to particular subject areas (such as new technologies or management theories), product sectors (such as software and hardware development), and vertical markets (such as the lottery industry). Best Practices are used frequently in the fields of healthcare, government administration, education, project management, hardware and software product development, and elsewhere. A commitment to using the Best Practice in any field is a commitment to using a prescribed method to ensure success.

A NASPL Best Practice is a Best Practice that applies to the lottery industry, has been approved by the NASPL Standards Initiative (NSI), and which serves as a recommendation for adoption by the lottery industry. A NASPL Best Practice is a practice that when implemented is intended to improve the quality and integrity of the lottery environment, and to provide increased efficiencies, resulting in reduced costs and increased profit margins for lotteries, vendors, and lottery retailers.

A NASPL Best Practice is described in terms of its:

- Purpose
- Components
- Constituents and their roles
- Prescriptive requirements
- Methods and techniques
- Tools
- Relationship to other Best Practices

The development of a NASPL Best Practice involves the following stages:

1. The NSI, through the Best Practices Working Group, selects a candidate practice using specific assessment and acceptance criteria (as defined by the NASPL Steering Committee).
2. The Best Practices Working Group develops a Best Practice document.

3. Optionally, the Best Practice document is subject to an informal review process by NASPL members and the NSI participants.
4. The Best Practice document is subject to a formal review process by the NSI Steering Committee and the Best Practice Review Board.
5. A set of conformance criteria and a conformance policy for the Best Practice are defined.

The approved NASPL Best Practice describes the practice in enough detail to enable it to be readily deployed by other organizations, assuming the availability of the necessary resources.

This chapter describes this NASPL Best Practice in terms of its purpose and its scope, and gives a definition of the terminology used throughout this document.

## **1.1 Purpose**

This Best Practice is one of three addressing Quality Assurance of Product Development in the Lottery Industry:

1. Requirements Definition (this document)
2. Development Process (Doc. No. BP0402)
3. Acceptance Testing (Doc. No. BP0403)

The purpose of this set of Best Practices is to provide a documented set of quality assurance processes and procedures that will allow lotteries and vendors to follow an approved and repeatable method for the purpose of meeting the goals and objectives of the lottery through hardware and software deployment.

## **1.2 Scope**

This Best Practice – together with the associated Development Process and Acceptance Testing Best Practices – provides 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 this Best Practice, although general enough for many software and hardware production environments, has several quality assurance aspects that are specific to the lottery industry. This Best Practice is not intended to cover procurement of off-the-shelf applications or ready solutions.

This set of quality assurance Best Practices is related in some ways to the Request For Proposal (RFP) process, particularly with respect to Requirements Definition. The RFP process itself is the subject of another NASPL Best Practice, and is outside the scope of this document.

### 1.3 Terminology

This section provides a set of terms and their definitions, which should be used when describing and interpreting the Best Practice requirements of the quality assurance processes and procedures specified in this document.

- |            |  |
|------------|--|
| Must       | Indicates an absolute, mandatory requirement of the Best Practice that has to be implemented in order to conform to the Best Practice.   |
| Should     | Indicates a recommendation that ordinarily must be implemented. To conform to the Best Practice, an acceptable justification must be presented if the requirement is not satisfied.  |
| May        | Indicates an optional requirement to be implemented at the discretion of the practitioner, and which has no impact on conformance to the Best Practice.                              |
| Must not   | Indicates an absolute preclusion of the Best Practice, and if implemented would represent a non-conformity with the Best Practice.   |
| Should not | Indicates a practice explicitly recommended not to be implemented. To conform to the Best Practice, an acceptable justification must be presented if the requirement is implemented. |

## **2 Best Practice Environment**

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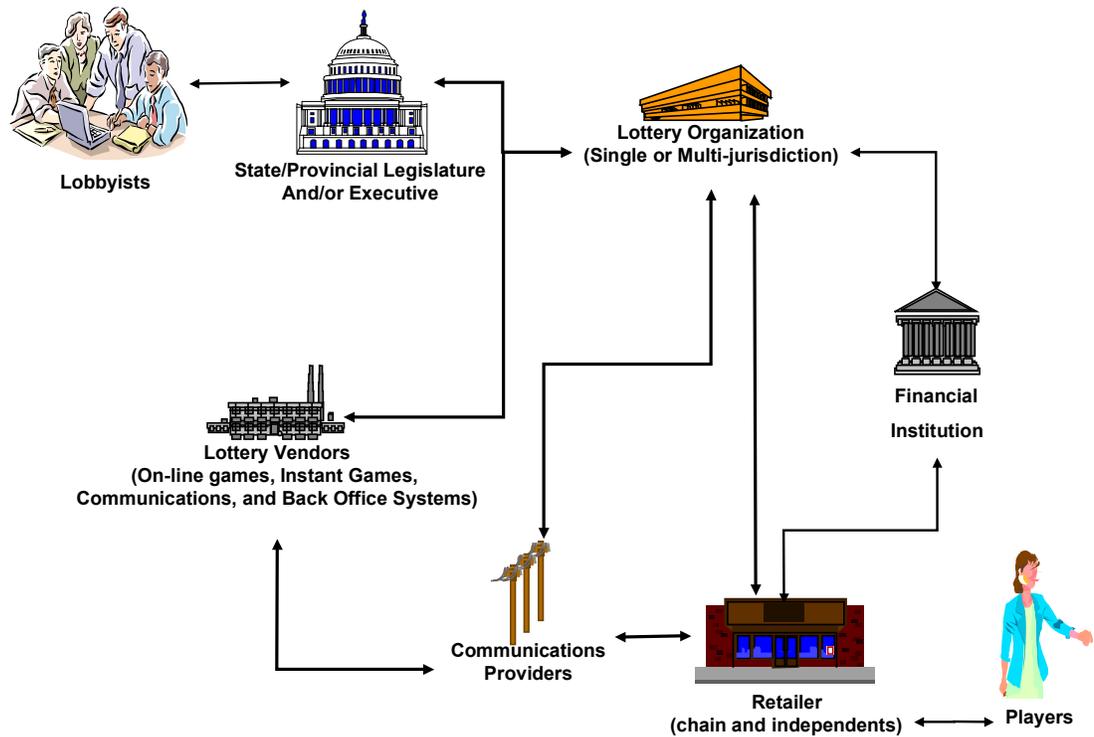
This section describes the typical business environment, the business drivers, and the objectives driving this NASPL Best Practice as context.

### **2.1 Business Environment Summary**

#### **2.1.1 Business Scenario – General Description**

This section describes the stakeholders in a typical lottery operation. The roles played by the constituents are not necessarily the same for every lottery. The constituents may take on different roles during the execution of business processes based upon local practice, how the lottery is organized, the budget allocated to the lottery organization, or any number of other factors. Therefore, in one jurisdiction a constituent may take a role that is taken by another constituent in another jurisdiction; for example, developing software or hardware for a lottery may be done by a vendor or by a lottery organization. These roles may actually change over time.

The key organizations and entities in the typical lottery business environment – particularly those relevant to the processes discussed in this Best Practice – are illustrated in the following figure.



**Figure 1: The Lottery Business Environment**

Not all organizations will have all of these components and relationships. However, the figure illustrates a number of points typical of lottery enterprises, each of which has particular implications for the benefits of standards for the lottery industry. Points to note regarding some of these constituents and their relationships to this Best Practice:

- Lottery vendors provide solutions for many lotteries; therefore, a reduction in the need for per-lottery customizations and variable quality assurance requirements improves the efficiency of the lottery vendor.
- Lotteries may buy different systems or components from different vendors over time, so developing a set of quality assurance Best Practices that are understood and followed by all vendors and lotteries will result in less time required in defining the practices and procedures to be followed during the product development lifecycle.
- Many lotteries participate in multi-jurisdiction games, bringing additional (and shared) governance processes and operational requirements. If requirements for quality assurance are defined as standard best practice among all lotteries, there would be less time and effort spent in meeting the cross-jurisdictional requirements, once a lottery decides to participate in a multi-jurisdiction game.

- The lottery retailers serve the players, and must do so in a timely fashion as most of the retailers are convenience (or sometimes grocery) stores where even occasional long waits resulting from poor quality gaming software or hardware systems can have significant impact on revenue.

The following list of constituents and the roles they play in the larger lottery environment is provided here to give a big picture view. The constituents involved in this Best Practice and the roles they play are a subset of those in the larger lottery environment and are identified in more detail in subsequent sections.

<b>Constituent</b>	<b>Role Played</b>
State Executive or Legislature	<p>Authorize lottery operation under state/provincial laws.</p> <p>Direct use of lottery revenues (and by implication, lottery operating budgets).</p> <p>Monitor and audit lottery operations, sometimes impacting lottery development.</p> <p>May appoint lottery director.</p>
Board of Directors / Lottery Commissioners	<p>Oversee lottery organization and their policies and procedures.</p> <p>Hire lottery executives.</p> <p>Approve major lottery contracts.</p>
Lottery Organizations	<p>Conduct overall operation of the lottery.</p> <p>May operate lottery IT infrastructure.</p> <p>May develop games.</p> <p>Oversee lottery integrity and security, including validation of winners.</p> <p>Optimize profitability from games (current and future), selecting new games, stopping old games, developing new games, and managing the selection and implementation of game infrastructure through Requests For Proposals (RFP).</p> <p>Manage retailers; including accounting, and game material inventory; e.g., instant game books.</p> <p>Manage vendors, including possible outsourcing of lottery operations.</p> <p>Develop marketing campaign.</p> <p>Manage large prize payouts individually or in conjunction with multi-state organizations.</p>
Retailers/Agents	<p>Sell lottery tickets and games at retail location.</p> <p>Market lottery products.</p> <p>Validate and redeem tickets.</p> <p>Manage and account to lottery for sales including ticket “books”, report sales to lottery commission, redemption of unsold game books.</p> <p>Manage accounting of lottery contribution to store profit and loss.</p> <p>Optimize contribution of lottery sales (within lottery regulations) to store.</p>
Financial Institutions (e.g., banks)	<p>Provide “sweep accounts” to facilitate transfers of funds from on-line and instant ticket purchase between the retailer/agent and the lottery.</p> <p>May provide interface between state treasury and lottery.</p>
Players	<p>Play on-line and instant games, self-validate tickets (in some jurisdictions), redeem tickets, and receive winnings.</p>

Constituent	Role Played
Lottery System Vendors	Provide lottery systems, components, games, and/or products. May provide the networking component (possibly customized) of a lottery system. Operate lottery IT systems (under subcontract from lottery organization) in many jurisdictions. Provide maintenance, field, and technical service in some jurisdictions. Respond to Requests For Information (RFI), Requests For Proposals (RFP), and Requests For Software Changes (RFS).
Telecommunications Providers	Provide the networking component (possibly customized) of a lottery system.
Lobbyists	Impact lottery responsibilities and limitations (through legislature) within a jurisdiction.

### 2.1.2 Operational Scenario

To provide an understanding of where and when the quality assurance Best Practices will be applied, this section depicts a typical product development lifecycle as it applies to the lottery industry: from specifying requirements to acceptance testing. This operational scenario highlights the major processes and illustrates the associated need for quality assurance Best Practices. It also identifies the constituents who will be carrying out the quality assurance Best Practices.

The software or hardware development cycle and the quality assurance processes associated with it begin with articulating requirements for new or upgraded software or hardware, which is done primarily by the appropriate lottery personnel within their own environment. Once the requirements are documented, they are handed off to the vendor. After the requirements are agreed, the vendor begins their development cycle incorporating quality assurance processes that cover design, implementation, testing, and release procedures. When the product is “released” to the lottery, the lottery, with the vendor supporting the process, performs acceptance testing to determine whether the product meets the acceptance criteria typically defined initially during Requirements Definition.

The constituents involved in this Best Practice are as follows, with the lotteries and vendors having a major role in most of the processes, and the retailers having a minor role in some jurisdictions:

- Lotteries
- Vendors
- Retailers/Agents

The operational environment for this Best Practice is:

- **Dynamic** – Lotteries continually upgrade existing games and institute new games so that their business can evolve and grow. High availability with optimum performance and quality software and hardware are essential in the lottery business so that downtime during upgrades, deployment of new games, and ongoing operations must be minimal.

- **Diverse** – Since there is no enforcement of a common method among lotteries, every jurisdiction’s operation executes slightly differently and according to its own method of choice and interpretation. However, there should be an effort to provide commonality between states where possible.
- **Local and culturally-specific** – Geographical differences mean that jurisdictions vary, manifesting in diverse needs. This represents diversity in participants and method, including cultural differences.

It is imperative that the quality assurance Best Practices support this business environment.

**2.1.2.1 Operational Functions and Processes**

The key functions and processes that require best practice support are further identified in the table below. The specific needs within each business function or process requiring best practice support are also described.

<b>Function/Process Name</b>	<b>Best Practice Needs</b>
Requirements Definition	The requirements for the system or system components must be defined, documented, agreed, and approved by both the supplier and customer of the system. Best Practices need to validate that this process happens, that the correct information is specified, and that the right processes are used in reaching agreement between vendors and the lottery.
Development Process	Use of a development process that covers design, implementation, testing, problem tracking and resolution, change control management, and release and installation. The process needs to include adequate documentation and approval phases.
Acceptance Testing	Utilize a defined Acceptance Testing process and plan that is typically agreed during Requirements Definition and is carried out in a controlled environment during Acceptance Test Execution.

**2.1.2.2 Operational Topology**

The topology of the environment to which this Best Practice applies (below) typically represents distributed and separate locations with variable overlap, and sometimes complete overlap, between some of these entities:

- Lottery Organization
- Retailer Site
- System Vendor
- ICS Vendor

### 2.1.2.3 Operational Location Information

The following matrix shows the *primary* locations where each of the functions or processes related to this Best Practice is executed, though all identified locations may not be involved in every situation. In cases where different parts of a function or process involve different locations, the component parts of the function or process are identified. This demonstrates the need for integration of different requirements when creating and adopting this Best Practice.

Functions/ Processes	Locations			
	Lottery Organization	Retail Site	System Vendor	ICS Vendor
<b>Requirements Definition</b>	X	X	X	
<b>Development Process</b>				
– Software and Hardware Design			X	X
– Software and Hardware Implementation			X	X
– Vendor Internal Testing			X	X
– Acceptance Test Readiness Review	X		X	
– Change Control System			X	
– Problem Reporting	X	X	X	X
– Problem Resolution			X	X
– Release Process	X		X	
<b>Acceptance Testing</b>	X		X	X

## 2.2 Business Rationale

This section describes the business drivers, objectives, and benefits of implementing this NASPL Best Practice.

### 2.2.1 Business Drivers

The major business drivers for implementing a Best Practice 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 decrease in 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.

## 2.2.2 Objectives and Benefits

This section outlines some of the business objectives for introducing the quality assurance Best Practices and some of the benefits that could be attained once these Best Practices have been adopted.

The major objective for implementing a Best Practice for Quality Assurance of Product Development in the Lottery Industry is to increase the integrity of the lottery business by producing higher-quality systems, which could result in the following benefits:

- **Reduced risk associated with liability** by providing assurances that the systems have been through approved quality assurance Best Practices, particularly during the Development Process and Acceptance Testing.
- **Reduction in lost revenue** as a result of better performance and higher availability.

- **Reduced costs** associated with development, testing, and maintenance.
- **Increased integrity**, resulting in greater public confidence and player satisfaction that could lead to increased sales.

## 3 Best Practice Overview

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This chapter provides an overview of the Requirements Definition Best Practice.

To assure quality in lottery systems, it is considered best practice to follow a consistent set of processes and procedures in three distinct phases of the lifecycle of a lottery system as follows:

- Requirements Definition
- Development Process
- Acceptance Testing

This Best Practice addresses Requirements Definition.

Requirements Definition covers the process by which the lottery and vendor define and agree on the requirements for the product to be produced, and the process by which the product will be produced and accepted. The outcome is agreement on what is required during the full product development lifecycle, with measures of success for meeting those requirements. This Best Practice covers the processes by which requirements are defined, documented, agreed, and approved by the lottery and the vendor, and identifies the types of information that need to be addressed during this phase in the product development lifecycle.

The applicability of this Best Practice 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

### 3.1 Relationship with Other Best Practices

This Best Practice is one of three that address Quality Assurance of Product Development in the Lottery Industry, as follows:

- Requirements Definition (this document)
- Development Process (Doc. No. BP0402)
- Acceptance Testing (Doc. No. BP0403)

This set of quality assurance Best Practices is related in some ways to the Request For Proposal (RFP) Best Practice, particularly with respect to Requirements Definition. The RFP Best Practice is centered around publication of the RFP, submission and evaluation of the response,

and vendor selection, whereas the quality assurance Best Practices are focused on Best Practices that should be implemented after the vendor has been selected by the lottery to provide the product(s) or upgrade(s).

## 4 Best Practice Description

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This chapter defines the Best Practice for Requirements Definition that occurs between the lottery and the vendor. Requirements Definition typically occurs after the vendor has been selected and a contract has been awarded for the project. Requirements Definition typically results in development of a more detailed level of requirements than the general level specified in the Request For Proposal (RFP) that preceded the contract award.

### 4.1 Overview

At the start of a project for production of a new product, or updates to an existing product, it is considered best practice that the requirements for the product are defined and documented to ensure that they are agreed and approved by both the supplier and customer of the system. Requirements Definition involves specifying the high-level functional requirements for the product, the overall design of the system, the user interface description, the project timeline, the quality assurance plans, and the acceptance criteria for the product.

The objective of this Best Practice is to define the process 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 in each of the following areas:

- Requirements Specification
- System Design
- User Interface
- Project Planning, including Quality Assurance Planning
- Acceptance Criteria

This Best Practice identifies the information (listed above) that will need to be documented during Requirements Definition. As production of a Requirements Specification is fairly standard in the lottery industry, this Best Practice presumes that the product requirements are documented in the Requirements Specification. To apply this Best Practice, the System Design, User Interface, Project Planning, and Acceptance Criteria will need to be documented, and this Best Practice allows for this to be done either in the Requirements Specification, or in another document that is subject to the same review, approval, and sign-off procedures as the Requirements Specification.

## 4.2 Constituents and Roles

In the context of this Best Practice, the customer is a Lottery Organization. The supplier may be a System Vendor or ICS Vendor. System Vendor refers to the entity producing the system or component, which may be a third-party vendor or the lottery organization itself. ICS Vendor refers to the internal control system vendor, which may be a third-party vendor or the lottery organization itself. Use of the term “vendor” in this Best Practice is meant to refer to either a System Vendor or ICS Vendor, unless one is specifically called out.

Constituent	Role
Lottery Organization	In conjunction with the vendor of the product to be produced, defines the requirements for the system or component. The Lottery Organization focuses on business requirements and technical constraints.
System Vendor	In conjunction with the Lottery Organization, defines the requirements for the system or component to be produced. The System Vendor focuses on technical requirements.
ICS Vendor	In conjunction with the Lottery Organization, defines the requirements for the internal control system to be produced. The ICS Vendor is not typically involved in Requirements Definition for the system that the ICS System will audit.

## 4.3 Components

### 4.3.1 Requirements Specification

The Requirements Specification establishes the basis for the agreement between the lottery and the system vendor on what the system is to do. It provides a clear description of what is required, with measures of success in meeting those requirements. A requirement specifies an externally visible function or attribute of a system.

The Requirements Specification helps:

- The lottery to accurately describe what it is they wish to procure
- The lottery to determine and document the risks and dependencies associated with the project and the mitigation strategies
- System vendors to understand exactly what the lottery wants

#### 4.3.1.1 *Best Practice Requirements*

A Requirements Specification must be produced to document the requirements for the new or updated system. Though the system vendor and lottery will both contribute to this document, they must define at the beginning of the process which organization has the responsibility for creating and maintaining the Requirements Specification.

Each requirement specified must be explicitly defined and enumerated to facilitate traceability back to the requirement later during the Development Process and Acceptance Testing.

The Requirements Specification must be formally reviewed and receive sign-off approval from both the lottery and the system vendor. Sign-off approval on the Requirements Specification should occur prior to the start of the Development Process.

The Requirements Specification must cover both the business requirements, which identify the business needs to be addressed by the product, and the customer's operational requirements for the product. The Requirements Specification must also cover technical constraints.

The Requirements Specification must address risk management. To accomplish this, the Requirements Specification must document:

- Risks associated with the project. Risks take many forms including, but not limited to:
  - Dependencies on third parties
  - Games may not gain public acceptance
  - Acceptance Testing may identify problems that result in delays in introduction
- Mitigation strategies for each of the identified risks.

The Requirements Specification must address the following, depending on the product being developed:

- Functionality: It must state what the system components are supposed to do.
- External interfaces: It must state one or more of the following:
  - How each system component interacts with people
  - How each system component interacts with other hardware
  - How each system component interacts with other software
- Attributes: It should state all of the following:
  - Reliability considerations
  - Portability considerations
  - Maintainability considerations
  - Security considerations
  - Performance considerations
  - Flexibility considerations
  - Scalability considerations
  - Integration considerations

### **4.3.2 System Design**

System design provides a high-level description of the lottery system and of the software and/or hardware component(s) that will be affected by the new or upgraded products. It provides an

overall description of the system and how the components interact to provide a solution that addresses the requirements.

#### **4.3.2.1 Best Practice Requirements**

The system design must be documented.

The system design must include an overall view of the system, including all relevant components and their role in the system.

The system design components and system design as a whole must map to the functional requirements defined in the Requirements Specification.

The system design documentation must describe the parts of the lottery environment with which the new system or updated system components will interact. For a new system, the focus is on the relationships and interactions between the new system and any existing systems, such as the lottery's existing back-office systems. For updated system components, the focus is on providing a sufficient understanding of the changes to be made and their impact on the overall system.

Specifically, the system design must describe at a high level:

- For system components containing hardware, the architecture of the overall lottery system in which the components will operate, including the relationships between the components.
- For system components containing software, the process flow, covering the various components, how they interact, and the interfaces between components. Additionally, the parameters, formulas, and restrictions regarding input, processing, and output requirements.

The system design must be formally reviewed and receive sign-off approval from both the lottery and the vendor.

### **4.3.3 User Interface**

The user interface description provides the user's perspective of how the system will work and its features. It describes the inputs and outputs, including what the user sees and how they interact with the system. The user may be a lottery or vendor employee (e.g., for a management terminal), a retail customer (e.g., for a lottery terminal), an employee at the retail site (e.g., for lotto tickets), or the lottery development organization (e.g., for an ICS system).

#### **4.3.3.1 Best Practice Requirements**

The user interface of the system must be documented. This may be documented in the Requirements Specification, or it may be included in another document.

The user interface description must include:

- Description of the portion of the system that the user will use to interact with the system (e.g., the keyboard, mouse, buttons, pictures, menus, windows, prompts, and dialogs).
- Description of the target users of the system.

- Scenarios of how potential users of the system would typically use the components. The scenarios should reflect typical users from each audience who will use the components.
- Description of the process flow or state transition that a user would go through for each area of functionality.

A prototype of the user interface may be used to demonstrate the user interface and help achieve consensus between the lottery and the vendor on the user interface description.

The user interface description must be formally reviewed and receive sign-off approval from both the lottery and the vendor.

#### **4.3.4 Project Planning**

The project planning process defines a set of requirements to be agreed upon by the lottery organization and its vendors. This planning process defines who must do what, when, and how. This process also allows for adjustment of the project plan to account for significant changes that might occur during the execution of the project.

##### **4.3.4.1 Best Practice Requirements**

A project manager must be assigned from the vendor organization, with the responsibility to monitor, control, and manage the project. A project manager should also be assigned from the lottery organization to interface with the vendor's project manager on behalf of the lottery and monitor, control, and manage the lottery's activities within the project.

There should be a high-level project planning document that is referenced by both the vendor and the lottery. The vendor and the lottery may each also have their own private project plans containing details specific to their own internal planning.

The project planning document should become a dynamic guide for the execution of the project. Supporting facts and documentation used to create the project plan should be included so that assumptions can be checked.

The project plan should include:

- An overall project schedule that must include:
  - Deliverables
  - Milestones
  - Dates
- Any pertinent time constraints, which may affect the overall project timeline
- Any pertinent dependencies or issues, which may affect the deliverables or schedule
- Resources assigned to the various tasks, and the timeframe for completion of each task
- Resource requirements needed by both the lottery and the vendor

- Roles, responsibilities, and contact information with phone numbers for each of the project team members from both the lottery and the vendor, including the project managers
- Plans for the level, type, and format of communications between the various parties during the course of the project
- Any pre-existing requirements needed for other organizations affiliated with the lottery
- Risks, risk tracking, and risk mitigation strategies

Vendors and lotteries must work together to define and formally agree the deliverables, milestones, and dates. They should work together to define applicable phase acceptance criteria for each phase of the project.

The project plan may include acceptance criteria associated with various phases of the project.

If acceptance criteria are defined for any phase of the project, then both lottery and vendor should sign-off that the acceptance criteria have been met for those phases of the project.

### **4.3.5 Acceptance Criteria**

Acceptance criteria are a set of benchmarks used to determine whether the project results are acceptable for release. These benchmarks 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. Guidelines for arriving at acceptance criteria are provided in the Acceptance Testing Best Practice.

#### **4.3.5.1 Best Practice Requirements**

Depending on the scope of the project, acceptance criteria should include and define the following:

- How each (if any) new hardware or software component change should function as determined by the project Requirements Specification.
- How each (if any) change to an existing hardware or software component should function as determined by the project Requirements Specification.
- The acceptable effect of any new or changed component (if any) on any other component or scenario.
- If adverse affects are expected, the risk should be considered and the acceptance criteria should reflect the acceptable levels of impact on daily operation. New or changed components may have an effect on one or more of the following and the acceptance criteria should document, when applicable, the acceptable impact on:
  - Customer satisfaction
  - Retailer sales and accounting
  - Ease-of-use

- Product and system integrity and performance
- Quality of products and product documentation
- Satisfaction of the acceptance test results
- Other factors
- The integration requirements, which should account for:
  - Reviewing the business processes impacted by the changes
  - Ensuring that the people responsible for the affected business functions know of the changes
  - Ensuring that the people responsible for the affected business functions are notified in advance of what business process changes need to be made (if any)
  - Ensuring that these non-software issues are resolved in time to support the installation of the new software or hardware

## 5 Methods, Techniques, and Additional Considerations

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This section describes methods and techniques that support Requirements Definition.

### 5.1 Requirements Specification

The development of the Requirements Specification document is a critical component of the product development lifecycle. In essence, the Requirements Specification becomes the agreement between the lottery and the vendor outlining the details of the desired product. Key aspects of the desired product are explicitly stated in the Requirements Specification. Effective communication between the lottery and the vendor is essential, especially at this point in the process.

It is important to remember when writing a Requirements Specification that you are specifying what the requirements are – and what is to be delivered – rather than how the requirements are to be met. How something will be developed is a function of system design and it is important to keep the two separate.

There are several methods that can be used to develop the Requirements Specification.

Joint Application Development (JAD) is a method that involves the lottery and all lottery end users in the design and development of an application through a succession of collaborative meetings called JAD sessions. In the context of a requirement elicitation technique, the vendor meets with lottery stakeholders in an attempt to establish the appropriate depth and breadth of the requirements of the system, software, or hardware being developed. The meetings begin with a discussion of the desired outcomes and evolve to the necessary level of detail to identify the specific requirements.

Use cases are another excellent method for gathering functional requirements that can be understood by technical and non-technical users. A use case describes a sequence of actions a system performs that yields an observable result of value to a particular actor. Use cases provide a functional view of a user's interaction with the system, so that the lottery and the vendor can agree on how a specific operation will occur. Use cases describe *how* the users and the system work together to realize the identified feature.

It is good practice to develop a checklist or template that identifies the information that your organization typically includes in a Requirements Specification. Then, when producing a Requirements Specification for a new project, referencing the checklist or template will provide your organization with a solid starting point based on what has worked well in the past. Maintaining the checklist or template by updating it at the end of each project ensures that the knowledge and learning of the organization are captured for use on subsequent projects.

When defining the business requirements, a good technique is to express these requirements in business process flow diagrams.

Prioritization of requirements and trade-off analysis are important techniques used during development of the Requirements Specification. If multiple products are covered by the Requirements Specification, the products are prioritized in order of importance. Prioritization of requirements serves many functions. It allows the vendor to work on the most highly-desired functions first, it allows for discussions about what items may not be able to fit into the project's implementation timeframe, and it provides visibility into what features may be the most important to test and verify during Acceptance Testing. Some prioritization models for requirements combine stakeholders' inputs into how desirable each feature is and what penalty or cost would be assessed if that feature were not provided. This provides greater visibility into the real cost/benefit for each requirement. It is important to remember that while prioritization is a sound practice, it sometimes makes sense to implement lower-priority items along with higher-priority ones, in cases where the lower-priority items can be done with small incremental effort and/or risk.

Brainstorming techniques can be used by both the lottery and the vendor to identify risks, mutual dependencies, and dependencies on third parties. The same brainstorming techniques can be used to form a mitigation strategy and plan to address each of the dependencies and risks.

These are only a few examples of techniques that can be used to develop the Requirements Specification. Regardless of the methods used, it is good practice for the lottery and the vendor to have a thorough discussion of all products required, with the Requirements Specification listing those requirements for each product in explicit detail.

## 5.2 System Design

Any one of a variety of system architecture methods may be used successfully to document a system – such as The Open Group Architecture Framework (TOGAF). Several key elements are common to any successful process, however, and will always be present, including:

- **Define the stakeholders of the process**

It is vital that all parties with a responsibility either to the building, implementation, testing, support, or use of a system are involved in the design process for the system. These are the same individuals who will approve the overall design, found in the functional and technical specifications.

- **Document the business requirements**

It is vital to document what business need or requirement is being addressed, and how the new or modified system will meet the need. The business requirements clearly define the benefits to the organization of meeting this need with a system change, and identify the cost of not proceeding, if that is a possible decision. This is not intended to be a technical document, but rather a description of the business issue/need that the system or modification will address.

- **Functional/technical specifications**

This portion of the system design clearly identifies what will be built. First from a functional perspective (what the user will see, use, and interact with), and second from a technical perspective (what databases, screens, programs interfaces, reports, inputs and

outputs, etc. will be built), the system's features are described in sufficient detail for competent professionals to understand clearly what needs to be built to meet the requirements.

- **Testing**

It is vital to document the standards (criteria) that will define success, and how that success will be measured and applied.

- **Risk assessment**

It is vital to document the risks associated with this development and how they can be mitigated.

- **Cost/benefit analysis**

Another important aspect is to identify the costs of the project and its benefits. Considerations include who incurs the costs and who receives the benefits; specifically, what this will do for the player, the retailer, the vendor, and the lottery. The success of an initiative often depends on understanding the motivations of the other stakeholders.

System design documents will ultimately be approved by the stakeholders described above and by the decision-makers who are responsible for paying for the development of the new or modified system. The information (documents) described above, plus any additional information these parties need to perform their function, are provided and included in the system design documents.

## **5.3 User Interface**

In any particular development project, there may be multiple user interfaces and target users. For example, there may be both a user interface for lottery administration of the system and a user interface for the retailer's terminal. Each user interface describes how the final customer will interact with the product provided. In a lottery system, the final customer could be the lottery, the retailer, or a player. The documentation of each user interface clearly defines what functions the user will perform and lists the corresponding output.

One method used to obtain this documentation is Wireframe diagrams. Wireframe diagrams provide a way to visualize and review the user interface content before the product is complete. Typically this process shows a black-and-white screen layout and may map directly to a particular use case. Using this method, the vendor can display the content of the product and the appearance of the product to the end user. For example, the vendor could provide a prototype of a menu screen for an internal lottery function detailing software application features while illustrating the functional screen layout. The user will supply feedback to the vendor based on their understanding of the requirements.

The result of this process will provide a clear understanding for both the user and the vendor of the desired product.

## 5.4 Guidelines for Project Planning

Project planning during Requirements Definition needs to address all aspects of the product development lifecycle at a high level. Thus project planning addresses:

- Requirements Definition
- Development Process
- Acceptance Testing
- Deployment

Project planning includes the specification of all of the following:

- High-level deliverables
- Milestones
- Schedules
- Responsibility for each phase of the project

Those aspects of the project plan for which a given party is responsible are managed at a finer level of detail by the responsible party using their internal project plan. A vendor has a vendor internal project plan for planning and managing the development work, and a lottery has a lottery internal project plan for planning and managing acceptance testing.

The role of project management is critical to the success of all facets of the product development lifecycle. Lotteries and vendors should consider personnel with experience and training in project management and project management tools to handle this function. A project management curriculum/certification should be recommended as part of the standard.

## 5.5 Acceptance Criteria

Refer to the Acceptance Testing Best Practice for guidelines, methods, and techniques for specifying the Acceptance Criteria.

## 6 Tools to Support Requirements Definition

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At this time we do not list specific tools, but rather describe the type of tools that support this Best Practice. Actual tools may be listed as the Best Practice matures.

An effective requirements management tool will aid in the transition from the abstract customer needs to the concrete, specific, and detailed requirements for a system, product, or component. It will also facilitate progression of requirements to design, implementation, and test by supporting traceability through the product development lifecycle. This provides a consistent framework for development, and will allow for easier validation of the delivered software. An effective requirements management tool will allow the vendor to track changes and enhancements and gauge the impact of these changes to the overall delivery.

It is also desirable for the tool to support the use of additional attributes (such as priority) for each requirement to support an additional level of detail for each requirement. Another highly desirable feature of the tool is the ability to support traceability of requirements through to design and test.

One example of the way in which a tool may support traceability of requirements is by generating a base-level Requirement Traceability Matrix (RTM), which can be enhanced as the project progresses through the different phases (design, build, testing, and implementation). The matrix serves as a guide to the customer-approved system requirements, providing a comprehensive list of all functionality, performance, and data requirements specified for the product or system. For each requirement, the RTM states the requirement identifier, its text, its source, and relevant comments; moreover, the RTM designates the portion of the system that satisfies the requirement. Prior to undertaking detailed tracking of requirements, a lottery must assess and understand the commitment level required. In addition to the need for a requirements management tool, training may be required. It is good to pilot detailed tracking of requirements on a smaller project before applying it to a whole new lottery gaming system, for example.

## 7 Conformance Overview

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Defining conformance and creating a certification policy and program for this Best Practice is the next step in establishing an effective Best Practice. Without the associated conformance criteria and certification processes, there is no assurance that a practitioner has implemented practices according to the approved Best Practice.

Certification provides formal recognition of conformance to an industry Best Practice or Technical Standard specification, which allows:

- Suppliers and practitioners to make and substantiate clear claims of conformance to a Technical Standard or Best Practice
- Buyers to specify and successfully procure from vendors who conform to the Best Practice or provide products that conform to the Technical Standard

Following the approval of this Best Practice, the NSI will work with The Open Group to establish conformance criteria and define an associated Certification Program for this Best Practice. The conformance assessment to be used will be determined at that time. Conformity assessment is the act of determining the compliance of an implementation to a specification, or the adherence of a business operation to a best practice or process definition. There are many techniques for assessing such compliance, including the use of a standardized test method, quality assessment by industry experts, and vendors' claims of conformance made within a defined legal framework. The techniques to be used will be chosen during the process of defining the Certification Program.

Following implementation of the Certification Program, practitioners wishing to have their practices certified as compliant to the Best Practice will be able to apply for certification of their practices, where a conformance assessment will be performed.

## APPENDIXES

### A Requirements Checklist

	Requirement	Level	Practitioner	Reference
<b>Requirements Definition: Requirements Specification</b>				
1	A Requirements Specification must be produced to document the requirements for the new or updated system. Though the system vendor and lottery will both contribute to this document, they must define at the beginning of the process which organization has the responsibility for creating and maintaining the Requirements Specification.	Must	Lottery Vendor	4.3.1.1
2	Each requirement specified must be explicitly defined and enumerated to facilitate traceability back to the requirement later during the Development Process and Acceptance Testing.	Must	Lottery	4.3.1.1
3	The Requirements Specification must be formally reviewed and receive sign-off approval from both the lottery and the system vendor.	Must	Lottery Vendor	4.3.1.1
4	Sign-off approval on the Requirements Specification should occur prior to the start of the Development Process.	Should	Lottery Vendor	4.3.1.1
5	The Requirements Specification must cover both the business requirements, which identify the business needs to be addressed by the product, and the customer's operational requirements for the product. The Requirements Specification must also cover technical requirements.	Must	Lottery	4.3.1.1
6	The Requirements Specification must document the risks associated with the project and the mitigation strategies for each of the identified risks.	Must	Lottery	4.3.1.1
7	The Requirements Specification must address the following, depending on the product being developed: <ul style="list-style-type: none"> <li>• Functionality: It must state what the system components are supposed to do.</li> <li>• External interfaces: It must state one or more of the following: <ul style="list-style-type: none"> <li>– How each system component interacts with people</li> <li>– How each system component interacts with other</li> </ul> </li> </ul>	Must	Lottery	4.3.1.1

	<b>Requirement</b>	<b>Level</b>	<b>Practitioner</b>	<b>Reference</b>
	<ul style="list-style-type: none"> <li>hardware <ul style="list-style-type: none"> <li>– How each system component interacts with other software</li> </ul> </li> <li>• Attributes: It should state all of the following: <ul style="list-style-type: none"> <li>– Reliability considerations</li> <li>– Portability considerations</li> <li>– Maintainability considerations</li> <li>– Security considerations</li> <li>– Performance considerations</li> <li>– Flexibility considerations</li> <li>– Scalability considerations</li> <li>– Integration considerations</li> </ul> </li> </ul>			
<b>Requirements Definition: System Design</b>				
8	The system design must be documented.	Must	Vendor	4.3.2.1
9	The system design must include an overall view of the system, including all relevant components and their role in the system.	Must	Vendor	4.3.2.1
10	The system design components and system design as a whole must map to the functional requirements defined in the Requirements Specification.	Must	Vendor	4.3.2.1
11	The system design documentation must describe the parts of the lottery environment with which the new system or updated system components will interact. For a new system, the focus is on the relationships and interactions between the new system and any existing systems, such as the lottery's existing back-office systems. For updated system components, the focus is on providing a sufficient understanding of the changes to be made and their impact on the overall system.	Must	Vendor	4.3.2.1
12	Specifically, the system design must describe at a high level: <ul style="list-style-type: none"> <li>• For system components containing hardware, the architecture of the overall lottery system in which the components will operate, including the relationships between the components.</li> <li>• For system components containing software, the process flow, covering the various components, how they interact, and the interfaces between components. Additionally, the parameters, formulas, and restrictions regarding input, processing, and output requirements.</li> </ul>	Must	Vendor	4.3.2.1
13	The system design must be formally reviewed and receive sign-off approval from both the lottery and the vendor.	Must	Lottery Vendor	4.3.2.1
<b>Requirements Definition: User Interface</b>				
14	The user interface of the system must be documented. This	Must	Vendor	4.3.3.1

	<b>Requirement</b>	<b>Level</b>	<b>Practitioner</b>	<b>Reference</b>
	may be documented in the Requirements Specification, or it may be included in another document.			
15	The user interface description must include: <ul style="list-style-type: none"> <li>• Description of the portion of the system that the user will use to interact with the system (e.g. the keyboard, mouse, buttons, pictures, menus, windows, prompts, and dialogs).</li> <li>• Description of the target users of the system.</li> <li>• Scenarios of how potential users of the system would typically use the components. The scenarios should reflect typical users from each audience who will use the components.</li> <li>• Description of the process flow or state transition that a user would go through for each area of functionality.</li> </ul>	Must	Vendor	4.3.3.1
16	A prototype of the user interface may be used to demonstrate the user interface and help achieve consensus between the lottery and the vendor on the user interface description.	May	Vendor	4.3.3.1
17	The user interface description must be formally reviewed and receive sign-off approval from both the lottery and the vendor.	Must	Lottery Vendor	4.3.3.1
<b>Requirements Definition: Project Planning</b>				
18	A project manager must be assigned from the vendor organization, with the responsibility to monitor, control, and manage the project.	Must	Vendor	4.3.4.1
19	A project manager should also be assigned from the lottery organization to interface with the vendor's project manager on behalf of the lottery and monitor, control, and manage the lottery's activities within the project.	Should	Lottery	4.3.4.1
20	There should be a high-level project planning document that is referenced by both the vendor and the lottery. The vendor and the lottery may each also have their own private project plans containing details specific to their own internal planning.	Should	Lottery Vendor	4.3.4.1
21	The project-planning document should become a dynamic guide for the execution of the project. Supporting facts and documentation used to create the project plan should be included so that assumptions can be checked.	Should	Lottery Vendor	4.3.4.1
22	The project plan should include: <ul style="list-style-type: none"> <li>• An overall project schedule that must include: <ul style="list-style-type: none"> <li>– Deliverables</li> <li>– Milestones</li> <li>– Dates</li> </ul> </li> <li>• Any pertinent time constraints, which may affect the</li> </ul>	Should	Lottery Vendor	4.3.4.1

	<b>Requirement</b>	<b>Level</b>	<b>Practitioner</b>	<b>Reference</b>
	<p>overall project timeline</p> <ul style="list-style-type: none"> <li>• Any pertinent dependencies or issues, which may affect the deliverables or schedule</li> <li>• Resources assigned to the various tasks, and the timeframe for completion of each task</li> <li>• Resource requirements needed by both the lottery and the vendor</li> <li>• Roles, responsibilities, and contact information with phone numbers for each of the project team members from both the lottery and the vendor, including the project managers</li> <li>• Plans for the level, type and format of communications between the various parties during the course of the project.</li> <li>• Any pre-existing requirements needed for other organizations affiliated with the lottery</li> <li>• Risks, risk tracking, and risk mitigation strategies</li> </ul>			
23	Vendors and lotteries must work together to define and formally agree the deliverables, milestones, and dates, and	Must	Lottery Vendor	4.3.4.1
24	They should work together to define applicable phase acceptance criteria for each phase of the project.	Should	Lottery Vendor	4.3.4.1
25	The project plan may include acceptance criteria associated with various phases of the project.	May	Lottery Vendor	4.3.4.1
26	If acceptance criteria are defined for any phase of the project, then both lottery and vendor should sign-off that the acceptance criteria have been met for those phases of the project.	Should	Lottery Vendor	4.3.4.1
<b>Requirements Definition: Acceptance Criteria</b>				
27	<p>Depending on the scope of the project, acceptance criteria should include and define the following:</p> <ul style="list-style-type: none"> <li>• How each (if any) new hardware or software component change should function as determined by the project Requirements Specification.</li> <li>• How each (if any) change to an existing hardware or software component should function as determined by the project Requirements Specification.</li> <li>• The acceptable effect of any new or changed component (if any) on any other component or scenario.</li> <li>• If adverse affects are expected, the risk should be considered and the acceptance criteria should reflect the acceptable levels of impact on daily operation. New or changed components may have an effect on one or more of the following and the acceptance criteria should document, when applicable, the acceptable impact on:</li> </ul>	Should	Lottery Vendor	4.3.5.1

	<b>Requirement</b>	<b>Level</b>	<b>Practitioner</b>	<b>Reference</b>
	<ul style="list-style-type: none"> <li>- Customer satisfaction</li> <li>- Retailer sales and accounting</li> <li>- Ease-of-use</li> <li>- Product and system integrity and performance</li> <li>- Quality of products and product documentation</li> <li>- Satisfaction of the acceptance test results</li> <li>- Other factors</li> <li>• The integration requirements, which should account for: <ul style="list-style-type: none"> <li>- Reviewing the business processes impacted by the changes</li> <li>- Ensuring that the people responsible for the affected business functions know of the changes</li> <li>- Ensuring that the people responsible for the affected business functions are notified in advance of what business process changes need to be made (if any)</li> <li>- Ensuring that these non-software issues are resolved in time to support the installation of the new software or hardware</li> </ul> </li> </ul>			

## B Documentation Checklist

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This Appendix summarizes the various documentation responsibilities of each party.

Under Responsibility, the following terms are used with these associated meanings:

- Sole** For documents in which the specified party has sole responsibility for producing the document in accordance with the requirements of this Best Practice.
- Primary** For documents that are to be authored by both parties, this identifies the party with the lead authoring role, and who has overall responsibility for producing the document in accordance with the requirements of this Best Practice.
- Secondary** For documents that are to be authored by both parties, this identifies the party that will work with the lead author to produce the document. The Secondary role has the responsibility to provide inputs, author portions of the document, and collaborate with the lead author to ensure successful completion of the document.

### Lottery Requirements

Item to be documented	Responsibility	Comments
Requirements Specification	Primary	This is the recommended role, though the lottery and vendor may agree at the start of a project to assume different responsibilities.
Project Plan	Secondary	
Acceptance Criteria	Primary	This may be documented in the overall Project Plan or included in another document.

### Vendor Requirements

Item to be documented	Responsibility	Comments
Requirements Specification	Secondary	This is the recommended role, though the lottery and vendor may agree at the start of a project to assume different responsibilities.
System Design	Sole	This may be documented in the Requirements Specification or included in another document.
User Interface	Sole	This may be documented in the Requirements Specification or included in another document.
Project Plan	Primary	
Acceptance Criteria	Secondary	This may be documented in the overall Project Plan or included in another document.

## Glossary

The following terms and acronyms are used in this document.

### Lottery Industry-Specific Terminology

Term or Acronym	Definition
Administrative Systems	Systems designed to support the lottery's business operations, such as accounting, retailer management, claims processing, and information management.
Back Office Systems	Data processing systems used to support the central business operation of the lottery, as distinct from gaming systems or systems employed by the retailer at the point of sale.
Gaming System	The set of software and hardware components required to deploy a particular game or set of games, which includes game terminals, network, and game host computers at the lottery central office.
ICS Vendor	The entity producing the Internal Control System, which may be a third-party vendor or the Lottery Development Organization.
Internal Control System (ICS)	The audit system and its associated processes, which perform auditing of the Gaming System component to ensure the integrity, security, and accuracy of gaming transactions.
Lottery Development Organization	The group within the lottery that is responsible for the development and/or integration of software and hardware components that comprise the lottery systems. They are responsible for running the IT systems and to a certain extent they act as an in-house technical development team. This service is often outsourced to third-party vendors.
Lottery Environment	The full set of software and hardware components that comprise a lottery, including gaming systems, the ICS system, administrative and back office systems, website, instant tickets, telecommunications network infrastructure, as well as the human participants who operate the hardware and software components including the Lottery Organization, vendors, retailers, and players.
Lottery Organization (Lottery)	The lottery organization comprises all those responsible for the overall operation of the lottery, which includes the director and other management personnel, and operational and technical personnel including the lottery development office. Together, they are responsible for overseeing lottery integrity, optimizing profitability from games (current and future), system procurement, managing retailers and vendors, and for marketing and payouts.

<b>Term or Acronym</b>	<b>Definition</b>
Lottery System (System)	The software and hardware associated with a particular function within the lottery, such as a gaming system.
Product	Product refers to the software and/or hardware that the lottery has contracted the vendor to produce.
System Components	The software and hardware components associated with a lottery system.
System Vendor	The entity producing the system components, which may be a third-party vendor or the Lottery Development Organization.

### **General Software and Hardware Industry Terminology**

<b>Term or Acronym</b>	<b>Definition</b>
Acceptance Testing	Testing performed by the lottery to determine the acceptability of the delivered lottery system or system components for deployment into the lottery environment.
Code Module	A code module consists of lines of high-level computer language which, when compiled, are designed to carry out a specific function or sub-function of the system. A code module will include self-contained documentation for maintainability in the form of explanatory comment text placed within the lines of code themselves and at the beginning of the module.
Code Walkthrough	A technical review, normally by peers, in which a programmer's code is reviewed by other programming professionals with the intent to identify bugs at an early point and prior to system integration.
Formal Method	The use of a mathematical model or fourth generation language for software design such that a proof of correctness of the resultant code to the requirement from which it was generated is inherent, thus dispensing with the need for internal testing to assure quality.
Integration Testing	Testing in which software components, hardware components, or both, are combined and tested to evaluate the interactions between them. Integration testing focuses on testing the interfaces between the components.
Interoperability	The exchange of data between separate heterogeneous systems.
Portability	The ability of software application code to be run on heterogeneous platforms without change to the code.
Requirements Specification	The Requirements Specification documents a description of the expected features, constraints, interfaces, and other attributes of the system components to be produced, and forms the basis for the agreement between the lottery and the system vendor on what the

<b>Term or Acronym</b>	<b>Definition</b>
	system is designed to do.
Sign-off	The act of formal agreement that a given phase in the product development lifecycle is complete.
System Design Specification	The System Design Specification, when used, is the document in which the system design description is documented. The system design description provides a high-level description of the overall lottery system, the software and/or hardware component(s) that comprise it, and how the components interact.
System Testing	Testing conducted on a complete, integrated system to evaluate the system's compliance with its specified requirements.
Test Case	A Test Case is a documented single test instance that includes a set of test inputs, execution conditions, and expected results developed for a particular objective, such as to exercise a particular program path or to verify compliance with a specific single requirement. It is desirable for test cases to be uniquely identifiable and traceable. Multiple test cases may exist for a single requirement.
Test Scenario	A set of test cases used to validate the behavior of a product through testing of the business process flows.
Test Script	A detailed set of instructions for the set-up, execution, and evaluation of results of one or more test cases. A test script may be executed by an automated test tool or manually.
Test Summary Report	A written report produced at the end of a period of testing (such as vendor internal testing, or the lottery's acceptance testing) that provides a summary of the types of testing performed and a summary of the results of that testing.
Unit Testing	The testing of individual hardware or software units or groups of related units.

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