

**FACULTY OF COMPUTING**

**BCS3263 SOFTWARE QUALITY ASSURANCE**

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**SOFTWARE QUALITY ASSURANCE PLAN (SQAP)**

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# **1.0 Purpose and Scope**

## **1.1 Propose:**

The purpose of this plan is to develop a Software Quality Assurance (SQA) strategy for the Lilly Kids Outlet System, a web-based management system aimed at facilitating the efficient management of an online outlet for children's products. This system will allow users to browse and purchase items, manage their profiles, and enable administrators to manage inventory, track orders, and oversee customer interactions.

This SQAP outlines the organization, tasks, and responsibilities for quality assurance, providing the standards, practices, and tools necessary to achieve a high-quality, reliable, and user-friendly platform (Whee Yen Wong et al., 2022). By following these guidelines, the project aims to deliver a system that meets its functional requirements while ensuring a positive experience for users.

## **1.2 Scope:**

This document serves as the Software Quality Assurance Plan for the Lilly Kids Outlet System, detailing the tasks, processes, and procedures that will ensure effective and high-quality delivery. This SQAP will:

1. Provide an overview of the SQA planning framework.
2. Specify the SQA procedures that will be applied across all phases of the software development lifecycle (SDLC) to ensure compliance with quality standards.
3. Identify risks to the Lilly Kids Outlet System and establish mitigation strategies to address these risks proactively.

This SQAP will guide the quality assurance activities throughout the project lifecycle, ensuring that all deliverables meet technical, functional, and user requirements.

# **2.0 Definition and Acronym**

## **2.1 Introduction**

Software Quality Assurance (SQA) is the process of ensuring that software products and processes meet specified requirements and quality standards (Claude Y. Laporte & Alain April, 2018). SQA encompasses planning, monitoring, reviewing, testing, and continuous improvement of software development activities and deliverables (Amit Bhanushali, 2023). The objective of SQA in the Lilly Kids Outlet System project is to ensure that each component of the system is developed in line with quality expectations and fulfills all functional requirements effectively.

## **2.2 Acronyms**

|  |  |
| --- | --- |
| **Acronyms** | **Definition** |
| SDLC | Software Development Lifecycle |
| SRS | Software Requirement Specification |
| SDD | Software Design Document |
| SQA | Software Quality Assurance |
| SQAP | Software Quality Assurance Plan |
| SEO | Search Engine Optimization |

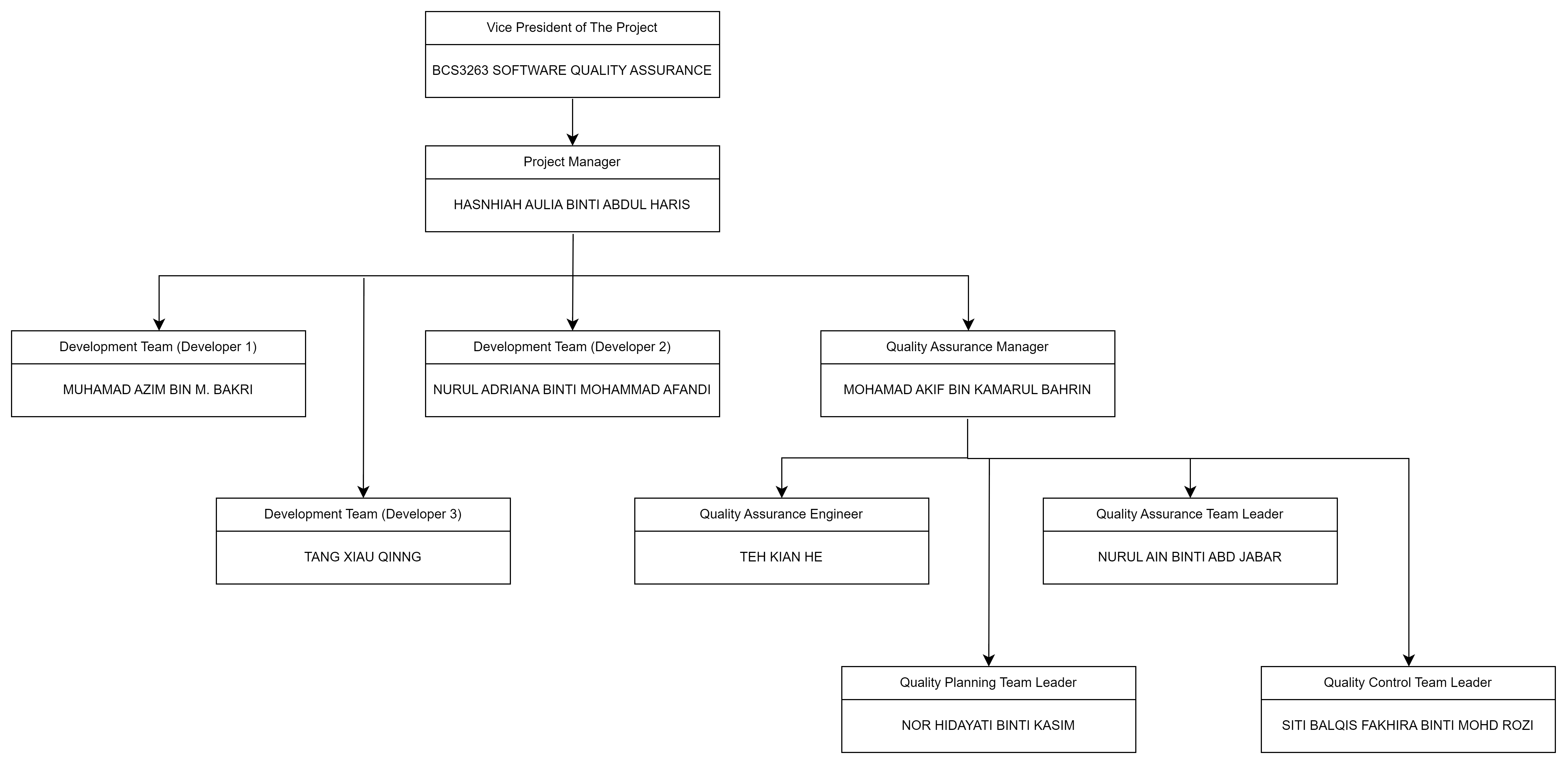
Table 1.1

# **3.0 References**

1. 730-2014 - IEEE Standard for Software Quality Assurance Processes. (n.d.). IEEE Standard | IEEE Xplore. https://ieeexplore.ieee.org/document/6835311
2. C. Y. Laporte and A. April, “Software Quality Assurance Plan,” in Software Quality Assurance, 2017. doi: 10.1002/9781119312451.ch13.
3. United States Environmental Protection Agency, “Guidance for Quality Assurance Project Plans,” Environmental Protection Agency, no. December 2002.
4. Amit Bhanushali. (2023). *Ensuring Software Quality Through Effective Quality Assurance Testing: Best Practices and Case Studies*. <https://www.researchgate.net/publication/375342628_Ensuring_Software_Quality_Through_Effective_Quality_Assurance_Testing_Best_Practices_and_Case_Studies>
5. Whee Yen Wong, Toong Hai Sam, Chian Wen Too, & Wei Fong Pok. (2022). *Software Quality Assurance Plan: Setting Quality Assurance Checkpoints within the Project Life Cycle and System Development Life Cycle*. <https://ieeexplore.ieee.org/document/9782044>

# **4.0 SQA Plan Overview**

## **4.1 Organization & Independence**

Figure 1.1

|  |  |  |
| --- | --- | --- |
| **Role** | **Assigned to** | **Responsibilities** |
| Project Manager | Hasnhiah Aulia Binti Abdul Haris | * Ensure the project is on track by monitoring tasks and meeting milestones. * Coordinate the team to ensure everyone works well together. * Manage risks by identifying and addressing potential issues early. * Ensure quality by working closely with the QA team. |
| Developer 1 | Muhamad Azim Bin M. Bakri | * Collaborating with the team to design and implement software solutions. * Debugging and troubleshooting issues. * Meeting development milestones and deadlines |
| Developer 2 | Nurul Adriana Binti Mohammad Afandi | * Develop the Customer Inquiry Management module to streamline customer inquiries and improve response times * Test and debug module components * Maintain documentation and update Project Manager on progress |
| Developer 3 | Tang Xiau Qinng | * Develop, test and maintain codes of system. * Troubleshoot issues and fix bugs. * Achievement development deadlines and milestones. |
| Quality Assurance Manager | Mohamad Akif Bin Kamarul Bahrin | * Oversee all testing activities for Lilly Kids Outlet System to meet quality standards * Define testing strategies, methodologies, and quality assurance policies * Collaborate with developers to address defects and improve quality |
| Quality Assurance Engineer | Teh Kian He | * Design and execute test plans and cases for all system modules * Identify, report, and track software defects * Document and communicate test findings to the QA Manager and development teams |
| Quality Assurance Team Leader | Nurul Ain Binti Abd Jabar | * Review and refine test plans for each module * Monitor test execution and results for consistency * Supervise QA team activities and coordinate assignments with the QA Manager |
| Quality Planning Team Leader | Nor Hidayati Binti Kassim | * Lead quality planning activities for the system, ensuring alignment with quality goals * Track and monitor quality metrics * Assign tasks to team members and support their progress towards quality objectives |
| Quality Control Team Leader | Siti Balqis Fakhira Binti Mohd Rozi | * Develop and enforce quality control procedures for each system module * Collaborate with project teams to align quality objectives * Supervise quality control activities to ensure compliance with established standards and regulations |

Table 1.2

## **4.2 Software Product Risk**

|  |  |  |
| --- | --- | --- |
| **Risk** | **Risk Description** | **Mitigation** |
| Product Catalogue Management Risk | The correctness and consistency of the data are the risks that might arise in this module. This risk includes mistakes or discrepancies in the menu that is displayed due to a number of reasons, including staff members updating information incorrectly, technical difficulties during updates, or problems with synchronisation between various system components. | To reduce human error, use strict validation procedures during staff changes to ensure data accuracy and consistency within the menu catalogue module. These procedures include required fields, character input restrictions, and predefined data formats. To facilitate easy tracking of menu modifications and prompt reversal of any improper revisions, maintain version control and an audit record. Create automated testing methods to guarantee data integrity and to assess the quality and consistency of the menu that is displayed on a regular basis. |
| Supplier Management Risk | The risk that might occur in this module is data accuracy and consistency. This risk involves human error in inserting data, synchronization delays, and technological failures. The staff might unintentionally insert incorrect information about the suppliers, forget to update information or make syntax errors. Software bugs, internet disruptions, and unexpected system failure might also occur and cause incomplete data. | Data entry validation should be implemented in the system to ensure that the data entered is correct and accurate. The format and range of data input can be implemented to reduce the insert of invalid data. For example, the amount of clothing only allowed insert of numbers.  Automatic backup should be implemented in the system to restore the data even if the system breaks down or unexpected system failure. |
| Customer Inquiry Management Risk | Data Inaccuracy; Incorrect or outdated information displayed to customers can lead to misunderstandings, loss of trust, and potentially legal issues if the data impacts decision-making. | Implement regular data validation and synchronization with other relevant systems and customer feedback channels for quick issue detection. |
| Usability Issue; If the interface is difficult to use or navigate, customers may struggle to manage inquiries effectively, leading to frustration and underutilization of the module. | Conduct usability testing, use user-friendly design principles, and gather regular feedback to improve the interface. |
| Content Management Risk | **Content Inaccuracy**  Publishing inaccurate or outdated content, such as incorrect tips or product details, may mislead users and harm the brand’s credibility. | Implement a content review and approval workflow to verify facts, edit, and approve content by an assigned administrator before publishing. |
| **Unauthorized Content Access or Modification**  Without strict access control, unauthorized users could access or alter content, potentially publishing unapproved or inappropriate material. | Without strict access control, unauthorized users could access or alter content, potentially publishing unapproved or inappropriate material. |
| **System Performance Issues**  As content grows, large media files may lead to slower load times or server overload, affecting user experience. | Set file size limits, use image optimization tools, and consider a Content Delivery Network (CDN) to enhance media handling and reduce server load. |
| **Search Engine Optimization (SEO) Errors**  Incorrect metadata or poor SEO practices such as duplicate content and lack of image optimization, may reduce visibility in search engine results, impacting traffic. | Integrate automated SEO checks or schedule regular audits to ensure best practices. Include metadata fields for consistent SEO standards across posts. |

## **4.3 Tools**

|  |  |
| --- | --- |
| **Tools** | **Description** |
| Wordpress | Serves as the foundation for creating and hosting the *Lilly Kids Outlet System* website and content management system. Allows for handling client interactions and managing user interfaces. |
| MySQL | MySQL is the database management system used to store and retrieve data for the *Lilly Kids Outlet System*. It supports SQL queries for managing data and validating information during testing. |
| Microsoft Word | Essential for creating and maintaining project documentation, including the Software Requirement Specification (SRS) and Software Design Document (SDD) |
| Github | A platform for version control and collaboration, allowing the team to manage code changes and work together efficiently. |
| Microsoft 365 | A suite of productivity tools including Word, Excel, PowerPoint, Teams, OneDrive, and Outlook, supporting documentation, collaboration, and project management. |

Table 1.3

## **4.4 Standard, Practices & Conventions**

To ensure the delivery of a fully conforming, high-quality product, all team members assigned to the Lilly Kids Outlet System project will engage in quality assurance activities. This section describes the standards, practices, and compliance procedures that will be used to meet the quality assurance provisions of this SQA Plan.

|  |  |  |
| --- | --- | --- |
| **Step of the life cycle** | **Intermediary Delivery** | **Standard, Practices or Conventions** |
| Planning | Project Proposal | Lilly Kids Outlet System project requirements |
| Planning | Software Quality Assurance Plan (SQAP) | IEEE Std 730-2014 (latest standard for SQA Plan, defines requirements for establishing, implementing, and monitoring software quality assurance). |
| Design | UI Mockups/Prototypes | IEEE Std 1016-2009 (Provides guidelines for creating and verifying software design documentation). |
| Programming | Source code | WordPress Coding Standards |
| Testing | Test Plans and Test Cases | ISTQB Testing Standards. |
| Transition to Production | Technical documentation | Project-specific production criteria and deployment checklist. |

Table 1.4

## **4.5 Effort, Resources & Schedule**

**Effort**

* **SQAP Development**

This involves creating the Software Quality Assurance Plan (SQAP), which outlines the quality processes, standards, and procedures necessary to ensure the overall quality of the project.

* **Documentation**

Delivers ongoing documentation tasks essential for monitoring project progress, including requirements, designs, test cases, and user stories.

* **Product Catalog Module Development**  
  This encompasses both front-end and back-end tasks for designing, developing, and deploying the Menu Catalog module on the Lily Kids website.
* **Supplier Management Module Development**  
  Begin by gathering requirements for managing supplier information, focusing on functionalities like adding and updating supplier details. Design a user-friendly interface for staff to input data and establish backend logic for data integrity. Conduct thorough testing to ensure all features function correctly.
* **Customer Inquiry Management Module Development**:

Focuses on developing a responsive user interface and back-end support for handling customer inquiries. Efforts will center on creating forms for inquiry submission, real-time response handling, and customer support tracking. Focus on a responsive interface to enhance user experience, and test regularly to ensure effective management of inquiries.

* **Content Management Module Development**

This module allows admin to create, edit, and manage blog posts or articles. Efforts here include setting up the content creation interface, implementing controls for adding media, and establishing workflows for content publishing.

* **Quality Assurance**  
  Throughout the project, continuous monitoring, testing, and validation methods will be employed to ensure that all quality standards and criteria are met

**Resources**

|  |  |
| --- | --- |
| **People** | * Project Manager * Developers (for each module) * Quality Assurance Manager * Quality Assurance Engineer |
| **Tools** | * WordPress * MySQL * Microsoft Word * Google Products * Github |
| **Equipment** | * Computers * Servers |

Table 1.5

**Schedule**

|  |  |
| --- | --- |
| **Phase** | **Duration** |
| SQAP Development | 2 – 4 weeks |
| Documentation | Throughout the project |
| Product Catalogue Module Development | 6 – 8 weeks |
| Quality Assurance | Throughout the project |

# **5.0 Activities, Outcomes and Tasks (module)**

## **5.1 Product Assurance**

## **5.2 Process Assurance**

# **6.0 Additional Consideration**

## **6.1 Contract Review**

Examining and evaluating a contract’s terms, conditions, clauses, and legal duties is included in contract review. Before signing or finalizing the agreement, a detailed analysis of the contract’s implications, risks, and requirements will be conducted by legal experts or professionals to the stakeholders. The goals of the contract review are to verify accuracy, capture potential risks, and confirm compliance with pertinent laws and regulations. Reducing miscommunication, clarifying roles and responsibilities, and protecting the interests of all relevant parties involved in the contract will be ensured during this process.

## **6.2 Quality Measurement**

Metrics including defect density, catalogue loading reaction time, and user acceptance rates should be defined in order to set precise goals for Lily Kids Outlet System’s quality measures. Throughout the development process, the QA team regularly measures and optimizes these KPIs. To ascertain whether the system achieves quality standards, the team validates data obtained through testing, audits, and user input.

## **6.3 Waivers & Deviations**

Establishing a clear procedure within the Lily Kids Outlet System is necessary to determine who is responsible for waivers and deviations. The project manager assesses the impact and takes action with the quality assurance team when deviations from established standards arise due to unanticipated events. Data gathering, data validating, and reporting are the responsibilities of the quality assurance team, in addition to ensuring thorough documentation of deviations and decision-making.

## **6.4 Task Repetitions**

Lily Kids Outlet System has a procedure in place to fix any errors or defects found during a task iteration. The teams inspect their work, capture the root cause of the error or defect, and take immediate action to fix it. To enable better iterations and reduce the likelihood of similar issues in the future, the quality assurance team makes sure that the issue and the solution are thoroughly documented.

## **6.5 Risk to Performing SQA**

SQA may be impacted by discrepancies resulting from difficulties integrating several modules, such as supplier management and product catalogue. To capture defects as soon as possible, continuous integration and regular integration testing throughout the development process should be implemented.

In the other hand, misunderstanding or missed quality standards might arise from unclear communication between the development team and the quality assurance team. To guarantee team alignment, regular weekly meetings, clear documents, and good communication should be implemented to both development and quality assurance teams.

## **6.6 Communications Strategy**

Weekly status meetings should be arranged with the development team, quality assurance team, and project manager. This enables the project manager to go through the development process and resolve issues that need immediate attention.

Ensure that up-to-date and clear documentations of the quality assurance process are accessible to all quality assurance team members. The documentation and records can be stored in shared platforms such as Google Drive to allow immediate access to all relevant documentation and records.

## **6.7 Non-Conformance Process**

The incidence of non-conformance should be well-documented in order to preserve an extensive record for tracking, analysis, and future use. Defects might be centralized by recording the details and resolution of defects. For example, defect ID, summary, affected module, and responsible parties.

The steps to resolve the identified non-conformance can be outlined to ensure that the non-conformance is corrected and will not occur again. The correction process should also be recorded and documented, including the cause, process and result. This recorded documentation might be used as guidance for upcoming quality assurance initiatives and to assist with future improvements.

**7.0 SQA records**

## **7.1 Types of Records**

### **7.1.1 Project Records**

Project records encompass all documents related to the overall planning, management, and execution of the Lilly Kids Outlet System project. These records provide a comprehensive view of project goals, timelines, resource allocation, and risk management strategies. By maintaining detailed project records, the team ensures that each phase aligns with the project’s objectives and enables effective tracking of progress and adjustments. Key examples of project records include:

1. **Project Charter,** which outlines the project's purpose and scope.
2. **Project Schedule,** detailing timelines and milestones.
3. **Risk Management Plan,** identifying potential risks and mitigation strategies.
4. **Budget Reports,** which monitor financial resources throughout the project lifecycle.

### **7.1.2 SQA-Specific Records**

SQA-specific records document all quality assurance activities that verify the product’s compliance with specified standards and requirements. These records focus on capturing the results of testing, verification, and validation efforts, ensuring the Lilly Kids Outlet System meets its quality objectives. Examples of SQA-specific records include:

1. **Test Plans and Test Cases,** which define testing scope and conditions.
2. **QA Checklists** used for systematic reviews.
3. **Inspection and Review Reports** to document findings from code reviews and design inspections.
4. **Non-Conformance Reports (NCRs)** highlight any deviations from quality standards.
5. **Defect and Issue Tracking Logs** to monitor identified issues and track their resolution.

These records support quality transparency, facilitate issue resolution, and provide insights into areas for improvement.

## **7.2 Collection Mechanisms**

1. **Digital Tools**: Project management software such as Jira or Trello is used for tracking defects and managing test cases, while Google Drive or SharePoint serves as the primary document repository for storing and sharing records.
2. **Manual Processes**: Certain documents are reviewed and uploaded manually by QA team members at the end of each project phase. This practice ensures that all relevant records are up-to-date and accessible for future reference.

## **7.3 Responsibilities for Record Management**

1. **Collection**: Quality Assurance (QA) team members are responsible for collecting SQA-related records, while the Project Manager oversees the collection of project management documents.
2. **Filing**: All records are systematically filed in the designated storage system, following standardized naming conventions to facilitate easy retrieval.
3. **Maintenance**: The QA Lead is accountable for ensuring that records are current and accurate. Regular audits are conducted to verify the completeness and accuracy of the records.
4. **Disposal**: Upon project completion, records are either archived securely for future reference or disposed of following the company’s record retention policy.
5. **Sharing**: Project stakeholders, including management and subcontractors, are granted controlled access to relevant records based on their roles. Access permissions are managed to ensure data security and confidentiality.

## **7.4 Sharing with Stakeholders**

Key project records and quality assurance documentation are shared with stakeholders through secured channels, such as a shared document drive or via authorized email communication. Regular progress reports, inclusive of quality findings, are provided to stakeholders in a structured format. This ensures transparency and allows stakeholders to make informed decisions based on quality assurance insights.

## **7.5 Protection and Maintenance**

|  |  |
| --- | --- |
| **Aspect** | **Description** |
| Access Control | Access to SQA records is restricted to authorized personnel only, ensuring data security and confidentiality. Permissions are assigned based on roles and responsibilities. |
| Version Control | A version control system is used to track document revisions, providing a clear record of updates and ensuring that only the latest approved versions are accessible. |
| Backup Procedures | Regular backups are conducted to prevent data loss, ensuring that records remain available and recoverable in the event of technical issues or accidental deletion. |
| Data Integrity | A structured filing order is maintained for each document, categorized by project phase and type. This organization prevents unauthorized modifications and supports traceability. |

Table 7.5.1 Protection and Maintenance Description

## **7.6 Records from Subcontractors**

Subcontractors engaged in the Lilly Kids Outlet System project are required to submit periodic quality records, documenting activities that impact the overall quality of the project. Subcontractor records include progress reports, quality inspection results, and compliance certifications, which are reviewed by the QA team. These records ensure that subcontractor activities align with the project’s quality standards and do not compromise the integrity of the deliverables.