North Carolina

Department of Information Technology

Transportation

Enterprise Quality Management Plan

Version 2.0

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Document Version Control

Ver	Date	Revised By	Description
1.0	3/20/2020	Cheryl Ritter	Initial Release
2.0	9/08/2020	Cheryl Ritter	Update with improvements from PMO Rollout

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1 Enterprise Quality Management Plan Purpose

The DIT-Transportation (DIT-T) Quality Management Plan (QMP) defines the minimum quality requirements and standards for DIT-T delivery of Information Technology (IT) solutions. The purpose for managing quality is to validate that all DIT-T business applications changes are delivered following a standard set of deliverables based on the size and risk of the project.

Quality management includes two (2) key processes:

- Quality Assurance (QA)
- Quality Control (QC).

As defined by *A Guide to the Project Management Book of Knowledge (PMBOK Guide) 5th Edition*, *quality assurance* is the process of auditing the quality requirements and the results from quality control measurements to ensure that appropriate quality standards and operation definitions are used. QA is set of activities designed to ensure that processes are established to confirm the project deliverables comply with relevant quality standards throughout the project lifecycle (e.g., work assessments, process audits, etc.). QA also helps uncover causes of unsatisfactory results and establish lessons learned to avoid similar issues in this and other projects. QA is 'process' oriented.

Quality control, as defined by PMBOK Guide, is the process of monitoring and recording results of executing the quality activities to assess performance and recommend necessary changes. QC activities are designed to evaluate deliverables to ensure compliance with relevant quality standards throughout the project lifecycle (e.g., inspection, monitoring). It is 'product' oriented.

2 Enterprise Quality Management Overview

2.1 Enterprise Quality Management Goals

Delivery of Information Technology (IT) solutions is a core business competency of the Department of Information Technology – Transportation (DIT-T) organization. Effective development and deployment activities are the key to improving quality, productivity, and predictability of solutions delivered. Once operational, solutions become a fundamental part of how work is performed and critical to the business. It is imperative that the IT development and operations environments are stable, efficient, and meets the business requirements.

A primary component of quality management is an enterprise standard development methodology that incorporates quality processes, deliverables, and quality assurance and control checkpoints. DIT-T is a large diverse organization that benefits from the use of many development methodologies to deliver IT solutions based on technical, organizational, project and team considerations. One development methodology is not suitable for all implementations. However, all development methodologies have the following objectives in common:

- Ensure the delivery of high-quality solutions
- Provide strong management controls
- Maximize productivity

The goal of the Enterprise Quality Management Plan is to define a standard approach to ensure all DIT-T projects meet the objectives above while allowing DIT-T teams maximum flexibility to use the appropriate development methodology to deliver IT solutions.

2.2 Enterprise Systems Development Life Cycle (SDLC) Model

A Systems Development Lifecycle (SDLC) is a description of the phases, tasks, and deliverables that provide a framework for developing and managing a project from the receipt of the work request through the completion of the project. DIT-T uses a deliverable based SDLC model. A deliverable based approach is not specific to any one SDLC (i.e., Agile, Waterfall, etc.).

The key deliverables are the most important deliverables and may have multiple tasks or smaller deliverables included in their production. For example, a key deliverable is Requirements. Tasks involved in completing this key deliverable include requirements gathering, requirements definition, peer reviews, etc. Because the tasks are different depending on the development methodology used, tasks are defined by the DIT-T teams' development methodology.

Key deliverables are assigned to the four (4) DIT-T project types identified by IT Senior Management as representative of the most frequently use DIT-T project sizes. The key deliverable assignments are based on the size and risk associated with the project type. See Appendix A for project type size and risk criteria.

3 Quality Management Strategy

3.1 Key Deliverables Quality Management Plan

DIT-T's Enterprise SDLC contains the phases completed on all projects (PMO and operational), regardless of their size and risks. The phases are used to manage deliverables by the type of work being performed. Below are the phases and description of work completed:

- Business Concept phase is initiated with the receipt of the work request. An estimate is completed for the project and the project is prioritized.
- Initiation phase develops a scope statement for the work with high level requirements, resources needed, estimated costs, and estimated implementation date.
- Planning and Design phase delivers the detail requirements, design, and/or procurement of components to support delivery of the product.
- Execution and Build phase includes coding and/or configuration, testing by DIT-T and the end-user.
- Implementation phase includes end-user training and deployment of the product(s).
- Closeout phase includes activities to ensure all requirements have been met and to archive project documentation.

Deliverables are used to ensure the minimum quality requirements are met:

- Ensure the delivery of high-quality systems, provide strong management controls, and maximize productivity, are met (from section 2.1).
- To satisfy Eagle audit controls.
- Required resources are actively involved, including IT staff and end-users,
- Checkpoints to assure and improve quality.

The deliverables in the table below are the minimum required to meet the quality requirements above. The deliverables are required on all projects regardless of size and risk.

ID	Phase	Key Deliverables	Audit Control*
1	Business Concept	Work Request	ITGC03
2	Initiation	Scope of Work	ITGC03
3	Initiation	Scope of Work Approval	ITGC03
4	Initiation	Quality Management Plan	ITGC03, ITGC04
5	Initiation	Privacy Threshold Analysis (PTA)	ITGC01
6	Planning and Design	Requirements	ITGC01, ITGC02, ITGC03
7	Planning and Design	Requirements Approval	ITGC03
8	Planning and Design	Application Architecture Design (AAD)	ITGC01, ITGC02
9	Planning and Design	Design Document	ITGC03
10	Planning and Design	Design Approval	ITGC03
11	Execution and Build	Component Integration Test (CIT) Approved	ITGC04
12	Execution and Build	System Integration Test (SIT) Approved	ITGC04
13	Execution and Build	IT Testing Complete Approval	ITGC02
14	Execution and Build	User Acceptance Testing	ITGC03
15	Execution and Build	Sponsor Approved UAT	ITGC03
16	Execution and Build	Go Live Readiness Assessment	ITGC02, ITGC03
17	Execution and Build	Go Live Approval	ITGC03

***See audit control definitions are in Appendix B.**

The Enterprise Quality Management Plan satisfies the key deliverable requirement for a Quality Management plan. If a team has their own Quality Management Plan, the provisions of the Enterprise Quality Management plan must be included in their plan.

All projects must be able to provide deliverable artifacts for internal and external audits. To ensure the availability of deliverable artifacts, required deliverables are:

- Named using the naming convention in the Enterprise SDLC or the naming convention established in the team's mapping document.
- Stored in a document repository established by each team.

3.2 DIT-T Methodology Management Plan

DIT-T teams may use the appropriate development methodology to deliver IT solutions. To facilitate usage of multiple development methodologies, a mapping provision is included in the Enterprise Quality Management Plan.

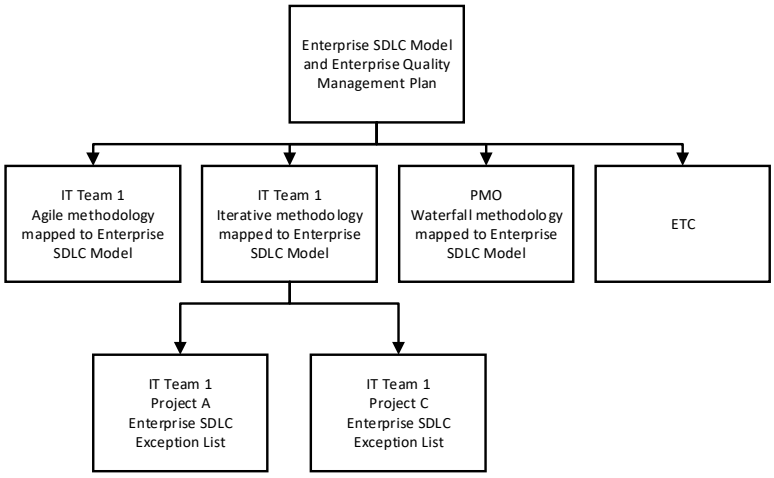
For maximum flexibility in delivering IT solutions, DIT-T teams will map their delivery processes and deliverables to the Enterprise SDLC and Enterprise Quality Management Plan.

If a team uses more than one delivery process, each process is mapped to the Enterprise SDLC. For example, a team has mainframe and web applications, and they follow Waterfall and Agile processes respectively to implement solutions. Both their Waterfall and Agile processes are mapped to the Enterprise SDLC.

Mapped development methodologies must be approved by the team's DIT-T senior manager. Once approved, the development methodologies are stored on the Enterprise SDLC SharePoint site for use by teams.

Individual projects are not mapped if they follow an approved mapped process. If a project has exceptions to the process followed, an SDLC Exception list is maintained to indicate deliverables not produced and justification.

Below is a picture that demonstrates the above concepts.



3.3 Compliance Management Plan

All DIT-T staff will follow the Enterprise SDLC and DIT-T Quality Management Plan for delivery of solutions. They are expected know and understand DIT-T's Enterprise SDLC model and know the location of the DIT-T Enterprise SDLC documentation.

To aid the DIT-T staff in understanding the Enterprise SDLC model and what is required to be compliant, the following are available on the Enterprise SDLC SharePoint site:

- Enterprise SDLC Deliverables Mapped to DIT-T project types
- Enterprise Quality Management Plan
- Mapping Instructions and Templates
- Approved Enterprise SDLC Mapping Documents

DIT-T senior management is responsible for managing compliance within their area of responsibility.

All exceptions to the Enterprise SDLC model and Enterprise Quality Management Plan require DIT-T senior management approval. Exceptions include mapped processes, Enterprise Quality Management Plan, Enterprise SDLC Exception list, deliverable naming convention, and deliverable artifacts repository.

4 Roles and Responsibilities

Listed below are the primary roles and responsibilities necessary for effectively managing the Enterprise Quality Management Plan and Enterprise SDLC Model.

Role	Quality Responsibility
DIT-T CIO	• Champion the use and value of the Enterprise SDLC to DIT-T staff and business.
DIT-T Project Management Office (PMO)	• Collecting Enterprise SDLC process improvements, coordinate changes to the process, and communication of changes to DIT-T. • Responsible for initial rollout/training on Enterprise SDLC. • Work with Auditors to identify improvements needed as a result of the yearly Eagle audit.
DIT-T Request Screening group	• Responsible for classifying ServiceNow work requests as enterprise project, lite project, non-PMO project, change request project or a project initiative.
DIT-T Senior Management	For their area of responsibility: • Responsible for assuring that the IT business processes, systems, and infrastructure meet the business requirements. • Responsible for assessing IT projects for compliance to Enterprise SDLC. • Responsible for working closely with their teams to ascertain whether they have the necessary awareness, tools, training, and guidelines to effectively deliver solutions using the Enterprise SDLC. • Responsible for approving mapping documents for compliance to Enterprise SDLC. • Responsible for providing individuals to continue SDLC training and support after rollout.
DIT-T Staff	• Know and understand DIT-T's Enterprise SDLC and Enterprise Quality Management Plan and know the location of the DIT-T Enterprise SDLC documentation. • Responsible for ensuring and validating that DIT-T projects are executed according to the requirements of the DIT-T Enterprise SDLC and Enterprise Quality Management Plan throughout the project lifecycle. • Responsible for managing the activities of contractors, vendors and service providers engaged in IT projects and ensuring that methodologies used are compliant with the DIT-T Enterprise SDLC model and Enterprise Quality Management Plan. • Responsible for ensuring that project reviews are performed at appropriate intervals.

Role	Quality Responsibility
	• Responsible for ensuring each project plan will perform Quality Assurance reviews of the Enterprise SDLC processes and deliverables to ensure the integrity and quality of the solution being delivered to the business customer. • Responsible for working with the Business to ensure they understand their responsibilities. • Responsible for quality control on their projects. • Responsible for complying with all state and federal regulatory requirements.
Business Representative	• Participate in completion of deliverables as assigned. • Review all project deliverables, and solutions to ensure their needs are met, quality standards are satisfied and provide signoff. • Provide feedback on the Enterprise SDLC Model, mapped development methodologies, and the Enterprise Quality Management Plan.

Appendix

Appendix A: Project Types

Project types were chosen by DIT-T senior management as the types typically completed by DIT-T.

Project Types

IT work is categorized as PMO projects and operational projects. According to PMBOK:

- The purpose of a project is to attain its objective and then terminate.
- The objective of an ongoing operation is to sustain the business. Ongoing operations involve permanent or semi-permanent functional work to repetitively produce the same product or service.

PMO projects include work requests managed by the PMO. Operational projects include work requests managed by all other DIT-T groups, including application teams, infrastructure, architecture, security, and Help Desk.

PMO Projects

Typically, PMO managed projects involve providing an IT service to citizens, businesses, employees or providing a method for an agency to improve services or be more efficient at providing services. Examples include:

- New technology purchases and implementation regardless of cost (e.g. new business application)
- Development and establishment of new IT service offering (e.g. ITSM/ITAM, CRM, Cisco telephony)
- Development and establishment of new capabilities
- Feasibility studies and proof-of-concepts
- Procurement using the RFP process for IT Technology or Services
- Outsourcing of business functions to a vendor that includes IT systems
- IT Reserve Fund Spending

PMO projects are further divided into:

- Enterprise projects include efforts whose costs minus internal agency personnel costs are greater than $250,000.
- Lite projects include efforts that are low risk, have an O&M budget less than $500,000, and total project budget minus internal agency personnel costs that are less than or equal to $250,000.

Operational Projects

Operational projects are divided into non-PMO projects and small work requests. Incidents are excluded and managed through ServiceNow.

Initiatives

Work designated by the DIT-T Request Screening group as an initiative and can be PMO projects or operational projects.

Appendix B: Audit Controls

Control Ref. #	Significant Process	Control Description
ITGC01	IT General Controls	The organization has a System Development Life Cycle (SDLC) methodology, which includes security and processing integrity requirements of the organization.
ITGC02	IT General Controls	The System Development Life Cycle (SDLC) methodology includes requirements that information systems be designed to include application controls that support complete, accurate, authorized, and valid transaction processing.
ITGC03	IT General Controls	To maintain a reliable environment, IT management involves users in the design of applications, selection of packaged software and testing thereof.
ITGC04	IT General Controls	The organization acquires/develops application systems software in accordance with its acquisition, development, and planning process.