Software Design and Development

Procedure

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## Change History

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<th>Version</th>
<th>Date</th>
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<td>Change of terminology from Design Specification to Design Requirements.</td>
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1 PURPOSE

The purpose of this procedure is to define the steps necessary for software development of major software application products.

2 INFORMATIVE REFERENCES

- ISO9001:2000 5.2 Customer Focus
- ISO9001:2000 7.3 Design And Development

3 FLOW CHART

![Software Design and Development Flow Chart]

4 SOFTWARE ENGINEERING PROCESSES

4.1 Functional Specifications or Technical Requirements Documents

The Functional Specifications or Technical Requirements Documents (TRD) expand the requirements presented in the Design Requirements and Product Requirements Documents (PRD) with the appropriate level of detail so that software designers and software testers can design and test the application.

4.1.1 Elements

Elements of the requirements/specifications are the following as applicable, but not limited to:

1. Use-Case Analysis
2. Architecture Design
3. Allocation of Product Requirements
4. Non-functional & Emergent Properties
5. UML modeling
6. User Interface Design

Once the requirements/specification document is completed it is submitted for review and approval.
4.1.2 Review and approval

The requirement/specification document is distributed to Engineering and Program Management for their review and approval. Agreed changes are incorporated into the requirement/specification. Records of the review and approval are maintained in the SharePoint Project Folder (or Repository) in compliance with the Records Retention Matrix.

4.1.3 Design Control

The approved requirement/specification document is released through the Document Control procedure.

4.2 Design Document

The Design Document describes the design details for the software application as defined in the Product Requirements Document (PRD) and requirement/specification. This document presents the design of the application with methods that clearly show how the application will function. Elements of the document are the following as applicable but not limited to:

1. System Design/Architecture:
   A system diagram showing major interface-points, inputs, outputs and key functional components - supported by text descriptions.
2. Application Design:
   An object diagram (e.g. UML) supported by text can clearly define an object-oriented application. A program structure diagram showing inputs, process flows and key functional components will suffice for other technologies.
3. Database Design:
   A data model, data dictionary and data flow diagram
4. User Interface Design:
   A detailed GUI design with text supporting the navigation flow, descriptions of controls and data entry fields

4.2.1 Peer Review

The completed Design Document is reviewed within the Engineering group and updated accordingly.

4.2.2 External Review

Upon completion of the Peer Review, a meeting may be held between the Engineering groups, Program Management and Software Quality Assurance to review information and address problems encountered. Agreed changes are incorporated into the Design Document accordingly.
4.2.3 Design Control

The approved Design Document is released through the Document Control procedure.

4.3 Implementation

Source code is developed according to the design input, requirements, and specifications. Appropriate version control processes shall be followed to ensure change control and integrity of the code.

4.4 Development Tests

The Software Engineering team performs tests and reviews as required in the Project Plan. Development tests may consist of:

- Unit test
- Feature test
- Code review

Records of development tests are maintained in the SharePoint Project Repository in compliance with the Records Retention Matrix.

4.4.1 Test Design Control

The approved Design Document is released through the Document Control procedure.

4.5 Functional Walk-Through

Software Engineering delivers the software to the Software Quality Assurance team and provides a walk-thru of the features and any necessary information required or valuable for testing purposes.