Design Procedure

Version No: 1.2

**Revision History**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Version (x.y) | Date of Revision | Description of Change | Reason for Change | Affected Sections | Approved By |
| 1.1 | 1/10/18 | Baseline Version |  |  | Nagoor Inaganti |
| 1.2 | 10/10/18 | Updating the Tasks | Design Architecture | Tasks | Nagoor Inaganti |

**Approval History**

|  |  |  |  |
| --- | --- | --- | --- |
| Version (x.y) | Prepared By | Reviewed By/Date | Approved By/Date |
| 1.1 | Vijaya Somarepetta | Monalisha Mishra  3/10/18 | Nagoor Inaganti  3/10/18 |
| 1.2 | Vijaya Somarepetta | Monalisha Mishra  15/10/18 | Nagoor Inaganti  15/10/18 |

Table of Contents

[1 Purpose 4](#_Toc382390648)

[2 Entry Criteria 4](#_Toc382390649)

[3 Inputs 4](#_Toc382390650)

[4 Responsibilities 4](#_Toc382390651)

[5 Tasks 5](#_Toc382390652)

[6 Outputs 8](#_Toc382390653)

[7 Validations 8](#_Toc382390654)

[8 Exit Criteria 8](#_Toc382390655)

[9 Approvals 8](#_Toc382390656)

[10 Quality Records 8](#_Toc382390657)

[11 Reference/Related Documents 9](#_Toc382390658)

# Purpose

The objective of this document is to design, develop and implement solutions to requirements. Solution, designs, and implementations encompass products, Product components and product related lifecycle processes either singly or in combination as appropriate. Technical Solution Process starts with getting technical requirements and ends with the delivery of product components for product integration.

# Entry Criteria

* System Requirement Specification (SRS)

# Inputs

* Software Requirement Specification
* Requirements document.

# Responsibilities

|  |  |
| --- | --- |
| Role | Responsibilities |
| Project Management | Project financials  Status reporting  Project governance  Identification of missing roles and/or resources  Business stakeholder communication  Risk communication and management  Project planning  Change management |
| Configuration Management | Responsible for the process design  Manage any new requirements or changes to the Process  Directs and schedules the training of new CI owners and CI coordinators  Responsible for the execution of the process controls, ensuring that staff comply with process and data standards. |
| Requirement Management & Development | Identify stakeholders  Gather/elicit requirements  Analyze requirements  Specify/document requirements  Baseline requirement groups (verify, validate, and prioritize requirements- i.e.: agree and sign-off on requirements)  Communicate requirements  Monitor/track requirements  Manage and control changes to requirements  Report requirements compliance |
| Architecture and Design | Identifying business requirements and requirements of the stakeholders on the project  Designing the entire system based on the received requirements  Choosing the system architecture and each individual component of this system at a high level  Choosing the technologies for the implementation of each component and connections between the components  Architectural review  Code-review  Writing project documentation and its support  Creating unified development standards in the company  Controlling the architecture during the next iteration of the system release |
| Coding | Modifying software to fix errors, improve its performance, or upgrade interfaces.  Directing software programming and documentation development.  Working with customers or departments on technical issues including software system design and maintenance.  Consulting with engineering staff to evaluate software-hardware interfaces and develop specifications and performance requirements.  Designing and developing software systems using scientific analysis and mathematical models to predict and measure outcomes and design consequences.  Preparing reports on programming project specifications, activities, or status.  Conferring with project managers to obtain information on limitations or capabilities. |

# Tasks

The Technical Solution process area is applicable at any level of the product architecture and to every product, product component, and product-related lifecycle process with focus on the following areas.

* Evaluating and selecting the solutions.
* Developing High Level Design (HLD).
* Implementing the design.

**5.1. Evaluating and Selecting the Solutions**

* Project Manager/Project Lead analyses the Requirements document and SRS to understand the business and software specification requirements and identified alternative solutions.
* These solutions are based on proposed product architectures that address critical product qualities and span a design space of feasible solutions.
* The selection criteria would typically address costs (e.g., time, people, and money), benefits (e.g., performance, capability, and effectiveness), and risks (e.g., technical, cost, and schedule).
* The PM will identify the selection criteria to select a set of alternative solutions.
* PM and design team will identify the technologies currently in use from the repository and examine new technologies for competitive advantage.
* PM obtains the complete requirements allocation for each alternative and develops the selection criteria for selecting the best alternative with the help of DAR procedure.
* PM and design team evaluate each alternative solution/set of solutions against the selection criteria established in the context of the operating concepts and scenarios.
* PM identifies and resolves issues with the alternative solutions and requirements.
* PM select the best set of alternative solutions that satisfy the established selection criteria.
* PM identifies the product component solutions that will be reused or acquired from the organizational repository.
* PM and design team establish and maintains the documentation of the solutions, evaluations
* The Technical architect / PM decides on the planning of data package at the beginning of the LDL and its uses ie. Environment, functionality, security, data storage etc
* The determination of what products or product components will be acquired is frequently referred to as a “make-or-buy analysis.” It is based on an analysis of the needs of the project. This make-or-buy analysis begins early in the project during the first iteration of design; continues during the design process; and is completed with the decision to develop, acquire, or reuse the product.PM is responsible for this

**5.2 Developing Detailed Design**

Higher design establishes product capabilities and the product architecture, including product partitions, product component identifications, system states and modes, major inter component interfaces, and external product interfaces using the Software Architectural Document template.

* PM establishes and maintains the criteria (Modular, Clear, Simple, Maintainable, Verifiable, Portable, Reliable, Accurate, Secure, Scalable, Usable) against which the design can be evaluated.
* PM identifies, develops, or acquires methods (Prototypes, Structural models, Object-oriented design, Entity relationship models, Design reuse, and Design patterns) appropriate for the project.
* PM documents all the standards and conventions being followed for the designing in the DD.
* PM defines the system design goals and give a brief description of how the design meets the functional and non-functional requirements in the DD
* PM describes the functionality and structure of the developed design in the DD.
* PM lists all the global limitations or constraints that could crop up while designing the system software in the DD.
* PM indicates design alternatives to enable the user to select the optimal design solution by using the DAR process in the DD.
* PM provides a high-level description of the system architecture with the help of block diagrams in the DD.
* PM describes the system interfaces including databases and external interfaces in the DD.
* PM indicates interface alternatives to enable the user to select the interface by using the DAR process in the DD.
* PM provides the data base design with the help of an Data base diagram
* Lists all the reusable components of the system in the DD.
* PM describes the visuals and screen layouts designed including the overall design for each part in the DD.
* PM gets the DD reviewed tracks all the review comments to closure (if any) and gets the approval.
* PM determines the number of levels of design and the appropriate level of documentation for each design level in the design documents.

**5.3 Implementing the Design**

Once the design has been completed, it is implemented as a product component. This activity includes the allocation, refinement and verification of each product component. It also involves the coordination between the various product component development efforts.

* Developer reviews the HLD documents to understand the objectives of the project.
* Developer develops the program/ component code for the identified program unit or components based on the HLD and update the traceability matrix (RTM) with the source code references.
* Developer reviews the source code against the design document and the Bidirectional traceability matrix for correctness and completeness.
* Identified reviewer reviews the source code developed, by using the formal evaluation techniques such as Peer reviews / Walkthroughs / Code inspections as per the defined Coding Review Checklist to check if the coding conforms to the standards defined by Company Name.
* Developers perform the unit testing after the completion of coding of the modules or components.
* Developers track all the unit test defects in the Defect Log.
* PM indicates to the CM about the readiness of the modules for integration and further testing through Test readiness report.
* PM reviews the requirements, design, product, and test results to ensure that issues affecting the installation, operation, and maintenance documentation are identified and resolved.
* Use effective methods to develop the installation, operation, and maintenance documentation and adhere to the applicable documentation standards.
* PM conducts peer reviews of the installation, operation, and maintenance documentation and tracks all the review comments to closure. Revise the installation, operation, and maintenance documentation as necessary.

# Outputs

* High Level Design.
* Solution Design Document.
* Source Code.

Ref SRS Document for HLD, DD, Solution Design document.

# Validations

* Each task will be validated by SPEG team.

# Exit Criteria

* High Level Design.
* Code.

# Quality Records

* HLD.
* RTM.

# Reference/Related Documents

* HLD.
* RTM