HARATI
SOFTWARE

QUALITY ASSURANCE

Development Quality Assurance Process

Quality Assurance (QA) is a process which will be inherent to any task, process and deliverable that is involved with the Integrated Web Enabled Integrated Training Management System at FHI 360. HARATI is ISO certified organization and brings with it a strong, iterative QA approach which it uses for any engagement to serve clients across the globe. As may be seen from the depiction below, each quantum of work or deliverable is attuned to go through adequate levels of factual confirmation, analysis for conformity with plan and quality review.

HARATI places strong emphasis on our engagement management process. A multi tier quality assurance process brings down the chances of error in implementation / reporting. HARATI uses proven technological aids that can be used to monitor projects to their minutest detail. HARATI's cyclic approach to quality assurance during project management is provided in the table below

Activity no.	Activity	Activity description
01	Field work by team members and team leaders	Specification Documents Report Other deliverables
02	First level quality control	Factual accuracy Deliverable completeness
03	Team leader review	1st cut deliverable review Assessment of process compliance
04	Reporting quality metric	Quality metric including scope, coverage, local management feedback
05	Project manager review	2nd cut deliverable review Project timeline compliance
06	Audit quality debrief	Quality debrief Know-how carried over to next audit

Activity 6 carry forward

Back to Activity 1

Review Process

Internal Quality Assurance (IQA) and External Quality Assurance (EQA) reviews ensure product quality and Final Inspection (FI) review ensures that the appropriate process was followed in developing the product. Product replication and delivery ensures that the right product is delivered to the client. Teams both internal and external to a project carry out the quality assurance activities in a project. Internal quality assurance activities are done on a continual basis while a separate quality assurance group, headed by the Quality Coordinator, for an independent review, carries out external QA activities.

A quality assurance team will be associated with the project, which will ensure that the quality assurance activities are followed from the beginning till the end of the project. The team will have people with expertise in QA procedures, HARATI methodologies and the technical environment. This team will constantly interact with the project team and Quality Coordinator, in monitoring the software quality at every stage of its life cycle

Measurement – An Integral Part of the Quality Process

HARATI has developed a measurement framework using CMMi to address the customer needs. The measurement framework includes the metrics that are required from project level to relationship level to help review the client relationship strategically against the overall objectives. HARATI has well thought out set of performance values to measure and enhance product quality with broad goals as:

Deliver on time
Decrease software defect density
Maximize defect containment
Improved productivity and cost effectiveness
Overall customer satisfaction

With areas of measurement such as:

- Adherence to schedule
- Estimation accuracy – effort
- Review and defect detection effectiveness
- Defect density prior to delivery and after delivery
- Product Size and related effort
- Productivity
- Field Error Rate

Apart from defining the measures, target values are set for each metric and process improvements are made to achieve those targets. Statistical Process Control techniques are used to enhance Consistency, Predictability and performance improvements. In addition to these, Control Charts are drawn to measure process stability.

Process Audits

HARATI Quality Assurance Group (QAG) defines the audit frequencies for a project and conducts the same. The intentions of these audits will be to verify process compliance with plans and defined processes.

Quality Management System Document Structure

Quality Management System has a well-defined document structure that consists of documents defining the quality policies and organizational procedures, processes, standards and guidelines that are to be followed in software development and services.

Quality Manual embodies the overall mission, organization, process and procedures to be followed for software development, maintenance, conversion, package implementation and support functions.

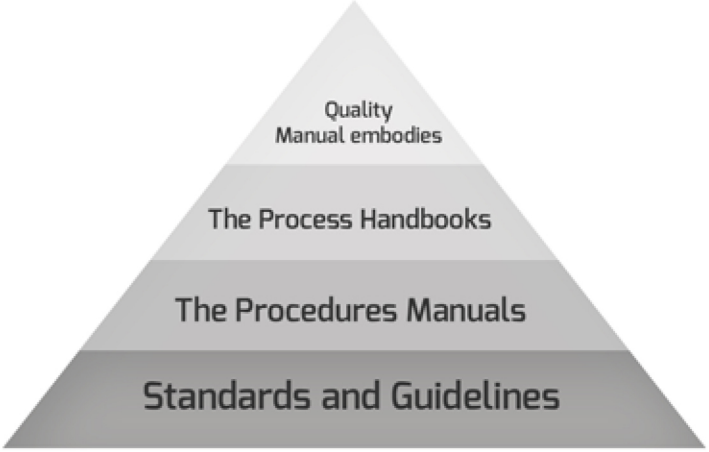
The Process Handbooks cover details of the entire development / maintenance life cycle. Architecture processes have been documented for software development, maintenance, and conversion. Projects have the flexibility of tailoring these processes to suit their requirements.

The Procedures Manuals cover various recurring activities that occur during a project lifecycle and the procedural steps to be followed for them, such as:

- Project Planning and Tracking
- Change Management
- Reviews and Inspections

Standards and Guidelines cover various guidelines for planning, estimation, configuration management, analysis, design, coding, testing etc. Various standards exist for programming on different platforms. Defect Analysis

- Project Metrics Analysis
- Process Change Management
- Technology Change Management



The following functional Activities will be performed by Software Quality Assurance (SQA) Team in Integrated Training Management System at FHI 360.

- Project's Defined Software Process (PDSP)
- Project's Quantitative Management Plan (PQMP)
- Testing Plan
- CVM plan
- Training Plan

Apart from this, SQA will review the guaranteed work Products

- Impact Analysis Document
- Test Case
- Release Note
- Review Report

SQA will also carry out Pre release Review for Compliance with

- Release Note
- SQA performs process audit on a monthly basis
- Process Audit covers all the process areas of CMM model
- Requirement Management
- Quantitative Project Management
- Software Quality Management
- Software Project Planning and Tracking
- Configuration and Version Management
- Risk Management
- Defect Prevention
- Software Product Engineering
- Peer Reviews

SQA facilitates preparation of

- Metrics Analysis Report (MAR)
- Root Causal Analysis Report (Monthly)

HARATI processes are built around SEI CMM and ensure conformance to the following areas:

- Systematic scoping, documentation, approval and base lining of customer requirement
- Estimation of size, effort, cost and schedule based on frozen customer requirement and periodically tracking the parameters for prevention of significant deviation
- Managing agreement with subcontractors, if any
- Configuration Management of all deliverables using tools for consistency and integrity of deliverables
- Software Quality Assurance group performing independent project-neutral verification and validation of deliverables, products and processes
- Organization level Software Engineering Process Group (SEPG) defining, deploying and maintaining Organization Standard Software Process (OSSP) which ensures uniform templates, process guidelines, checklists for entire organization
- Institutionalization of Peer Review mechanism for early defect detection, fixation and prevention
- Definition and standardization of activities like Requirement Analysis, Design, Development, Testing, Maintenance, Documentation etc
- Quantitative understanding and analysis of Product and Process related data for consistent and predictable performance
- Quantitatively establishing and continuously improving organization's process capability through systematic collection, archiving and analysis of projects' data in Software Process Database
- Proactive and organization level initiative towards Defect prevention
- Organization level Technology Change Management group formation for systematic new technology adoption and roll-out throughout organization through piloting and cost benefit analysis
- Managing a reusable component repository for cycle time reduction and uniformity in delivery through asset reuse
- Organization wide suggestion scheme for empowering all employees to participate actively in process improvement

Quality verification happens at every stage in the application design and development process. Solution Blue Print methodology with the application development platform makes quality process easy to implement and monitor. The seamless ability of the platform helps to implement, test and change the design and maintain the applications. The activities carried out are:

- Verifying Quality at each stage of the Development Process
- Automating Testing Process through use of Tools
- Tinkering of Models
- Implementing, Testing and Changing the Application

HARATI's approach to software development is based on one of the most reliable, effective and globally accepted methodologies in the industry today "The Rational Unified Process". The Unified Process is a configurable software development process that is based on many years of experience in using object technology to develop mission-critical software in a variety of industries. Using this technique, we focus on ensuring timely delivery of quality software solutions to our clients. This technique guides our project teams in managing iterative development in a controlled fashion while balancing business requirements, time-to-market and project risks. The process unifies the entire software development team and enhances team communication by providing each team member with one approach to develop software with an on-line knowledge base that can be customized to the specific needs of the project. Using this technique, we can ensure the effective and efficient allocation of resources, delivery of the right artifacts and the achievement of our ultimate goal, the timely delivery of quality software solutions to our clients. At HARATI, our processes bring into play industry best practices in capturing business requirements and establishing an architectural baseline early on, as well as in designing and testing the system driven by requirements and the architecture.

We use of Unified process for this project for the quality management due to the following reasons:

- It would be the best methodology to address the managerial & technical risks of the project
- It would allow for effective management of requirements
- It would enable high quality output of all project deliverables
- It would allow good management of changes

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