

**Metric Process**

**Version History:**

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| --- | --- | --- | --- | --- | --- |
| **Ver. No.** | **Date** | **Comments** | **Prepared By** | **Reviewed By** | **Approved By** |
| 1.0 | 12th May 2008 | Initial Draft | Jyotsna Bareja | Abhishek Rautela | Mr. Sudhir Saxena |
| 1.1 | 1st June 2008 | Reviewed & Release | Abhishek Rautela | Rohitash | Mr. Sudhir Saxena |
| 2.0 | 10th Sep 2009 | Update section 2.0 | Neha | Rohitash | Mr. Sudhir Saxena |
| 2.1 | 21st May 2010 | Updated Reference | Neha | Rohitash | Mr. Sudhir Saxena |
| 2.2 | 3rd March 2011 | Formatting and update references | Abhishek Rautela | Rohitash | Mr. Sudhir Saxena |
| 2.3 | 16th May 2013 | Update section 6.3 for open age of defect. | Maitri Saini | Rahul Raj | Ajay Kumar Zalpuri |
| 2.4 | 29th July 2015 | Update section 6.3 for CMMI L4 & 5 data requirements | Rahul Raj | Dhananjay Kumar | Ajay Kumar Zalpuri |
| 2.5 | 30th Jan 2016 | Update section 5.2 and 6.3 | Rahul Raj | Dhananjay Kumar | Ajay Kumar Zalpuri |

Table of Content

[1. Purpose 4](#_Toc350370591)

[2. Entry Criteria 4](#_Toc350370592)

[2.1. Business objectives 4](#_Toc350370593)

[2.2. PMP 4](#_Toc350370594)

[3. Glossary 4](#_Toc350370595)

[3.1. Metrics 4](#_Toc350370596)

[4. Inputs 5](#_Toc350370597)

[5. Roles & Responsibilities 5](#_Toc350370598)

[5.1. Metric Plan Inclusion 5](#_Toc350370599)

[5.2. Metric Analysis 5](#_Toc350370600)

[5.3. Metric Plan Creation 5](#_Toc350370601)

[5.4. Data Collection 5](#_Toc350370602)

[5.5. Review Analysis 5](#_Toc350370603)

[6. Tasks 5](#_Toc350370604)

[6.1. Data Collection 6](#_Toc350370605)

[6.2. Store Data 6](#_Toc350370606)

[6.3. Evaluate Data 6](#_Toc350370607)

[6.4. Result of Analysis 7](#_Toc350370608)

[7. Output 8](#_Toc350370609)

[8. Validation 8](#_Toc350370610)

[9. Exit criteria 8](#_Toc350370611)

[10. Reference Documents 8](#_Toc350370612)

# Purpose

Software process and product metrics are quantitative measures that enable software people to gain insight into the efficacy of the software process and the projects that are conducted using the process as a framework. Basic quality and productivity data are collected. These data are then analyzed, compared against past averages, and assessed to determine whether quality and productivity improvements have occurred. Metrics are also used to pinpoint problem areas so that remedies can be developed and the software process can be improved.

# Entry Criteria

The entry criteria for process metrics is:

## Business objectives

The metric process begins as soon as business objectives for the organization are laid out. The panel concerned decides upon the metrics to be used for measuring each measurable process/activity so that objectives are achieved in efficient manner.

## PMP

When the PMP is created by Project Manager, the metrics for each identified activity and its various components are decided there itself.

# Glossary

The glossary can be divided into two categories:

Definitions:

## Metrics

Software metrics provide a quantitative basis for the development and validation of models of the software development process. Metrics can be used to improve software productivity and quality.

Abbreviations

* **CRP** : Change Request Plan
* **PMP** : Project Management Plan
* **CM** : Configuration Manager
* **PM**: Project Manager.
* **DM**: Delivery Manager.

# Inputs

The major inputs for Metric process are:

1. Project Management Plan
2. Change request
3. Defect logs
4. Project schedule

# Roles & Responsibilities

The responsibilities of **Project Manager** are:

## Metric Plan Inclusion

The project manager includes the metric plan created by Metric process into the Project Management Plan.

## Metric Analysis

The Project Manager performs the analysis of metrics created by the metric process.

The responsibility of **Quality Manager\Quality Lead** is also to coordinate the analysis activities at organization level with SEPG and respective Project Managers. Organizational level Metric analysis will be done twice in a year for effort distribution

## Metric Plan Creation

The Quality Manager is responsible for creating the metric plan deciding which metric to be used for measuring which activity. Also it defines the time and frequency of the metrics operation.

## Data Collection

The Delivery Manager\Project Manager\Quality Lead is responsible for collecting data on which the metrics have to be performed.

## Review Analysis

The Delivery manager \ Project Manager analysis the reports of the metrics analysis.

# Tasks

The tasks defined by Metric process are:

## Data Collection

The data for performing the metric process is collected and stored at some central place so that it can be assessed by the manager for performing the actual calculations. The sources through which the data can be collected are:

1. Timesheets
2. Change Request
3. Bug Tracking systems

## Store Data

The data is stored at some central place for easy access by the manager for performing measurements. The data can be stored in working folder. Also the history of data should be maintained for future references.

## Evaluate Data

Metrics have been aligned with the business objectives the various types of metrics used are mentioned below:

* + 1. **Schedule Variance**: Any deviation from the baseline plan of a project, measured by comparing budgeted cost of work scheduled with budgeted cost of work performed. The formula for calculating Schedule variance is

SV = ((Actual duration – planned duration)/Planned duration)\*100

* + - * 1. **Effort Variance:** The effort variance (EV) is the percentage variance of the actual effort with respect to the planned effort. Reduction in EV value is achieved by continuously improving project estimation and planning practices at Momentum.

EV = ((Actual Effort – Planned Effort)/Planned effort)\*100

* + - * 1. **Defect Matrix**

**Types of Severity:** All the defect data shall be categorized within three categories i.e. (Low, Medium and High).

Type of Severity= No of High, Medium, Low

* + **Defect Removal Efficiency:** The defect removal efficiency can be calculated using the following formula

**Defect Removal efficiency**= (Internal defects / Internal defects +External defects) \*100

* + **Defect Density:** The defect density is used to find the defects for a particular size or module of the project in System Testing also called QC Defect

**Defect Density** = Total no. of defects / Size

**Size =** Total number of points count during estimation of the project +Total number or CR + Total number of Enhancement

* + **Delivered Defect Density:** The defect density is used to find the defects for a particular size or module of the project in UAT

**Delivered Defect Density** = Total no. of defects in UAT / Size

**Size =** Total number of points count during estimation of the project +Total number or CR + Total number of Enhancement

* + **Cycle Time:** This is calculated in hours that will subtract the hold time.

**Cycle Time** = (Actual End Date – Actual Start Date)-Hold

* + **QC Effectiveness:** Measuring the review defects in early stage of SDLC cycle

**QC Effectiveness=** Review Defects+ Unit Testing Defects / Review Defects + Unit Testing Defects + System Testing Defects

* + **Open Age Metric Report:** Open age metric report for calculating of defect age.

Closed Date – Open Date= Open age of Defect (in man days)

* + **NC Trend Analysis:** This is done by analysis of the various NC reports after the conduction of the Audits.

The NC’s are categorized under the following categories:

* + **Human**
  + **Process**
  + **Tool**
  + **Technology**

Also the other tasks will be:

* + Deciding upon the format of the metric reports.
  + The time at which the metric reports will be published.

Number and distribution of NCs in internal audits

Number of open /closed/rejected change requests in a project

## Result of Analysis

The result of metric report analysis is analyzed to find the cause of variance and taking preventive actions to prevent it from happening in the future. The results are conveyed to the SEPG and the senior management for approval though organizational Metric report and project report publication in SEPG meetings Appropriate seven QC tools like pie chart, Pareto diagram, bar charts, run charts; fish bone diagram shall be used for analysis of metrics data.

# Output

Outputs are:

* + - * Metric reports.
      * Metrics discussions performed weekly.

# Validation

* Review and approval of Metrics Plan from higher authorities.
* Reviewed metrics report.

# Exit criteria

The exit criteria

1. Baselined Metric Report

# Reference Documents

The various reference documents are:

* Project Metric Database document