Van Lang University

Software Measurement and Analysis course

Defect Data Report

**Version number:** 1.0

**Author:** K14T01 – Team 01

**Team member:**

Duong Nguyen

Mung Nguyen

Binh Huynh

Hien Nguyen

Manh Nguyen

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1. **INTRODUCTION**

The purpose of this document is to *specify the method to be measured the quality for Viking project in aspects of process quality and product quality*.

The document will *draw a Viking product* *defect lifecycle* that is used to develop a set of metric which analyze the provided Viking product defect data and *draw graph supporting our assertions* regarding Viking product quality in Team Assignment#10.

The document will also *evaluate the quality of Viking project and offer our recommendations* to ensure that quality is not an accident for the Viking project based on defect data.

The Defect Data in this assignment will be collected from *“Viking\_Product\_Defect\_Data-TA10.xls”.*

1. **DEFECT LIFECYCLE**

Our team offers a Change Request Model that connecting to Defect Lifecycle Model. Why we do it? Because tester have to report it to the project team, when they find out the defect to fixing it. Tester has to use Change Request Form. The following is the figure which to show the defect life cycle.

*Figure\_1. Change Request Status Model Diagram*

The following is a table which to specify defect status in weekly defect lifecycle.

|  |  |
| --- | --- |
| **Status** | **Status Meaning** |
| Open | New, not yet assigned |
| Reopen | A defect that was previously Closed, Pending or Rejected has been Reopened. Typically this means that the Customer or QA has been able to reproduce the defect. |
| Rejected | From the evaluation it has been determined that this is either not a defect or it can’t/won’t be resolved. |
| Further Analysis | From the evaluation it has been determined that additional analysis is required |
| Pending | Additional information has been requested from the person who submitted the defect |
| Approved | The defect has been approved for resolution |
| Assigned | The defect has been assigned to a software engineer who will work on the defect |
| Resolved | The software engineer responsible for fixing the defect believes that the defect is fixed. Typically this means that the updated product passes all unit and integration tests. |
| Not Resolved | The defect will consider resolved by the QA team, but not pass. Must be resolved again. |
| Tested | The defect is considered resolved by the QA team |
| Closed | The updated product is available for release. Sometimes the original defect submitter is responsible for closing defects, but often this isn’t possible. |

*Table\_1. Defect Status table*

1. **QUALITY MEASUREMENT**

The following is a table which to specify metrics using for quality measurement.

|  |  |  |
| --- | --- | --- |
| **ID** | **Required Data** | **Metric & Objectives** |
| 1 | * Total number of defect weekly * Number of defect by severity * Defect Severity Score | |  | | --- | | * An index representing the average of the severity of the defects. * Provides a direct measurement of the quality of the product. * Defect Severity Index = (Number of critical defect \* 1 + Number of high defect \* 2 + Number of medium defect \* 3 + Number of low defect \* 4) / Total number of defect weekly * At Ready to Ship * Zero non-closed critical defects * Than 10 non-closed major defects all with customer approved work-around * Less than 25 non-closed low defect * Less than 15 non-closed medium defects | |
| 2 | * Defects removed during a development phase * Defects latent in the product at that phase | |  | | --- | | * The number of defects that are removed per week. * Indicates the efficiency of defect removal methods, as well as indirect measurement of the quality of the product. * Defect Removal Efficiency (DRE) = Defects removed during a development phase / Defects latent in the product at that phase * Level-1CMMI,   + DRE > 80% is good for the project < 1000 function point. | |
| 3 | * Average time to fix a defect by severity | * Indicates the efficiency of defect removal methods * Defect Removal Effort (DREF) = Score severity \* Average time to fix a defect by severity / 10 * Team standard,   + DREF < 9 is good. |

*Table\_2. Metric Collection Table*

1. ***VIKING QUALITY REPORT***

The following is the status of defect in week 7.

|  |  |
| --- | --- |
| **Type of Status** | **Number of Defect** |
| Open | 21 |
| Approved | 9 |
| Assigned | 10 |
| Closed | 70 |

*Table\_3: Defect status in 19-August-2010 data*

*Figure\_2. Defect status in 19-August-2010*

**The following is the table and defect type chart which shows the quality of the product.**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Defect** **Severity Index** | | | | | | | |
| **Defect Severity (Score)** | **Week 1** | **Week 2** | **Week 3** | **Week 4** | **Week 5** | **Week 6** | **Week 7** |
| Critical (4) | 5 | 4 | 4 | 3 | 4 | 2 | 13 |
| High (3) | 8 | 6 | 4 | 11 | 2 | 5 | 5 |
| Medium (2) | 2 | 8 | 1 | 5 | 1 | 2 | 3 |
| Low (1) | 0 | 2 | 0 | 0 | 0 | 0 | 0 |
| **Severity Index** | 3.2 | 2.6 | 3.3 | 2.9 | 3.4 | 3 | 3.5 |

*Table\_4. Defect Severity Index Data*

*Figure\_3. Type of Defect Weekly chart*

*Figure\_4. Defect Severity Index Line Chart*

*The number of critical, high severity defects is being reported too much. The product can not ready to ship.*

*The defect severity index is sloping up at the week 7.* *This indicates an increasingly unfavorable trend. This indicates an increasingly unfavorable trend.* *As the test cycle progresses (from week 1 to week 7), the severity index is sloping up which suggests decreasing quality of the product.*

**The following is the table and defect type chart which shows the quality of the process.**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Week #** | **Open** | **Assigned** | **Resolved** | **Tested** | **Closed** |
| **1** | 15 | 0 | 0 | 0 | 0 |
| **2** | 35 | 15 | 8 | 7 | 7 |
| **3** | 44 | 35 | 35 | 34 | 33 |
| **4** | 63 | 44 | 44 | 43 | 43 |
| **5** | 70 | 64 | 65 | 64 | 64 |
| **6** | 79 | 70 | 71 | 70 | 70 |
| **7** | 100 | 80 | 71 | 70 | 70 |

*Table\_5. Number defect type counter weekly*

*Figure\_5. Cumulative Defects by Status*

The following is the data and line chart which show Defect Removal Efficiency (DRE).

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Week 1** | **Week 2** | **Week 3** | **Week 4** | **Week 5** | **Week 6** | **Week 7** |
| **Open** | 15 | 20 | 9 | 19 | 7 | 9 | 21 |
| **Closed** | 0 | 0 | 14 | 47 | 55 | 70 | 70 |
| **DRE** | 0 | 0 | 0.32 | 0.75 | 0.79 | 0.89 | 0.7 |

*Table\_5. Defect Removal Efficiency data*

*Figure\_6. Defect Removal Efficiency line chart*

*In generally, the DRE trend is sloping up from week 1 to week 6, indicates the quality of the process that is very good. However, the number of DRE is 70% in week 7.* *The process efficiency is less than the CMMI-level 1 standard (80%). This indicates the problem in week. In additional, the DRE is sloping down at the week 6 that indicate an increasingly unfavorable trend. It is not good for the quality product.*

The following is the Defect Removal Effort (DREF) by severity weekly.

|  |  |
| --- | --- |
| **Severity (Score)** | **Average time to fix a defect by severity (days / defect)** |
| Critical (4) | 9.8 |
| High (3) | 10.2 |
| Medium (2) | 8.9 |
| Low (1) | 10 |

*Table\_6. Average time to fix a defect by severity table*

*DREF = (9.8 \* 4 + 10.2 \* 3 + 8.9\*2 + 10 \* 1) / 10 = 9.75 > 9 (days / defect), so the process is not good at week 7.*