BeNutritious

Process Improvement Plan

**Submitted For:**

SER515 – Software Enterprise: Inception and Elaboration.

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# Introduction

Process Improvement is a continuous process and entails a lot of benefits. Personal Software Process is one such process that helps achieve this goal. It focuses on the individuals and believes in keeping a track of personal defects. The defect log is analysed and common mistakes observed which are kept in mind for future processes. It also believes in removing defects early and defect prevention. Rightly said a stitch in time saves nine, removing a defect early is not only cost efficient but also saves a lot of time later.

# Objective

* Analyse the development time of design to coding, design review to design and code review to code review and analyse it gains personal benefits.
* Calculate the Appraisal to Failure Ratio which speaks about the quality time spent in a project. Use this to analyse the various review phases and come up with a better plan that has a process yield of at least 70 %.
* Analyse the review rate to find out LinesOfCode reviewed per hour and make future plan of review time.
* Analyse the defect ratios, number of defects found during design to the number of defects found during unit test and similarly code review to compile. Based on these devise a personal plan that focuses on the weaknesses and devote greater time for those.
* Calculate the yield and based on these calculations analyse where the problem lies and rectify them in the next process.
* Analyse the defect removal leverage and use it to design a better defect removal plan for future.

# Computation of Time Measures

* Development time ratio:
  + Design time / Coding time = 1110/1170 = 94.8 %
  + Design review / design time = 410/1110 = 36.93 % (Marked red as not compliant with PSP)
  + Coding review / Coding = 625/1170 = 53.41 %
* Lines of Code reviewed per hour = 1200 / 10.41 = 115

# Computation of Quality Measures

* The following table shows the phase yield for each process:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Phase | Defects Injected | Defects removed | Defects at phase Entry | Phase Yield |
|  |  |  |  |  |
| Detailed Design | 10 | 0 | 0 |  |
| Design Review | 0 | 6 | 10 | 60% |
| Code | 13 | 0 | 4 |  |
| Code Review | 0 | 9 | 17 | 52.90% |
| Compile | 0 | 3 | 8 | 38% |
| Unit Test | 0 | 5 | 5 |  |
|  |  |  |  |  |
| Total | 23 | 23 |  |  |

* Process yield = (9 + 6) / 23 = 65.21
* Defect Ratio
  + Design defects / Unit defects = 6/5 = 1.2
  + Code defects / Compile defects = 9 /3 = 2.33
* Defect Removal Leverage
  + Design Review / Unit Test = (6/6.833) / (4/4.833) = .87/.81 = 1.07
  + Code review / Compile = (9/10.41) / (3/.58) = .86/5.17 = 0.166

# Analysis

* As PSP suggests the design review time to design time should be around 50% and as computed the design time to code time is less than 50%. This indicates that the design review was not done as done as competently as it should have been done or it may be a case where design took a lot more time. But the second possibility is ruled out as the time taken to code is equivalent to the design time. As per PSP this should be 1 and as the value computed above (.94) it is well aligned with PSP. Hence the problem should be in design review time.
* The other parameters such as design time to code time and code time to code review time are well within the PSP parameters and hence are not to be worried about.
* The Lines of Code reviewed per hour (115) is compliant with PSP which states that it should be below 200.
* As evident the phase yield is well below the mark of 70 % as suggested by PSP for high quality programs. This indicates a serious flaw in the code review and design review process. We can further analyse where the actual problem lies, in the code review phase or the design review phase.
* Further diving into further details and comparing the defect ratios, the code review to compile defects (2.33) are well above the values specified by PSP (2.0), however the ratio of defects design to unit test is well below the mark of 2.0 specified by PSP. This indicates a problem with either the design review phase or unit test phase.
* Lastly, we observe the defect removal leverage ratios that clearly indicate that more time should be spent on design review as the chances of finding defects at this stage are more than at the unit test phase.

# Recommendation

* It is clear from the analysis that there is a serious flaw in the design review phase. The design review to design phase, phase yield and the design review to unit test are all a testament of that. This indicates that there should be more time spent in the design review and design review should be done more efficiently.
* The next point that highlights the personal trait of finding more defects in the design review phase than at unit test. This is also counts towards reviewing the design more effectively.
* PSP suggests the line of code reviewed per hour should be in the range of 15- -200. Computations above show that the lines of code reviewed per hour was 115. Further PSP also suggests code review defects to compile time defects should be 2 or greater. The value computed above is 2.33, well above the mark of 2. Hence, the coding review time can be decreased slightly and can be observed in PSP 0.1 process. If successful, the personal recommendation would be to decrease it else keep it the way it is. However, this decision can be made only by observing the PSP process until PSP 3.
* A thorough analysis of the defect log indicates a major problem. Many of the review pertain to assignment defects. These defects injected out of ignorance not only proves costly but also is time consuming to analyse and fix defects at a later stage of development. Hence, extra care should be taken while writing assignment statements.
* The analysis of the defect log also tells us that there were 10 defects injected in the design phase. This is also an indication of the process used while designing. Hence the processes that were used during design phase must be reviewed and fixed.