ASSIGNMENT N0: 4

1. DEFECT REMOVAL RATE:

Defect Removal Rate = (Defects Removed / Lines of Code)

Phase	Defects Removed	Lines of Code(KLOC)	Defect Removal (per KLOC)
Requirements	50	39	1.282
Analysis	111	39	2.846
Design	154	39	3.948
Coding	466	39	11.948
Unit Testing	135	39	3.461
Integration testing	88	39	2.256
System testing	61	39	1.564
Field	16	39	0.410

2. DEFECT INJECTION RATE:

Defect Injection Rate = (Defects Injected / Lines of Code)

Phase	Defects Injected	Lines of Code(KLOC)	Defect Injection Rate (Per KLOC)
Requirements	217	39	5.564
Analysis	124	39	3.179
Design	177	39	4.538
Coding	551	39	14.128
Unit Testing	4	39	0.102
Integration testing	3	39	0.076
System testing	3	39	0.076
Field	2	39	0.051

3. DEFECT ESCAPE RATE:

Defect Escape Rate = (Defects Escape / Lines of Code)

Phase	Defects Injected (Cumulative)	Defects Removed (Cumulative)	Defects Escaped	Defects Escaped/KLOC	Defect Escape Rate
Requirements	217	50	167	167/39	4.282
Analysis	341	161	180	180/39	4.615
Design	518	315	203	203/39	5.205
Coding	1069	781	288	288/39	7.384
Unit Testing	1073	916	157	157/39	4.025
Integration Testing	1076	1004	72	72/39	1.846
System testing	1079	1065	14	14/39	0.358
Field	1081	1081	0	0/39	0

4. DEFECT REMOVAL EFFECTIVENESS:

Defect removal effectiveness:

(Defects removed at each step / (Defects existing at step entry + defects injected in the current phase)) * 100

Defect Removal rate for testing phases:

(Defects removed at current phase / (Defects removed at current phase + Defects removed at following phases)) * 100

Phase	Defects REMOVED	Defects Existing at Every Step	Defects Injected	Defect Removal Effectiveness	
				Calculation	
Requirements	50	0	217	(50/217)*100	23.04%
Analysis	111	217-50 = 167	124	(111/(167+124))*100	38.14%
Design	154	((217+124) - (50+111)) = 180	177	(154/(180+177))*100	43.13%
Coding	466	((217+124+177) - (50+111+154)) = 203	551	(466/(203+551))*100	61.80%
Unit Testing	135	((217+124+177+551+4) - (50+111+154+466+135)) = 157	4	(135/(135+88+61+16))*100	45%
Integration Testing	88	((217+124+177+551+4+3)- (50+111+154+466+135+88)) = 72	3	(88/(88+61+16))*100	53.33%
System testing	61	((217+124+177+551+4+3+3)- (50+111+154+466+135+88+61))=14	3	(61/(61+16))*100	79.22%

MOST EFFECTIVE PHASE: System Testing

REASON: Since, the Defect Removal Effectiveness is highest for this phase i.e. 79.22%.

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5. OVERALL DEFECT REMOVAL EFFECTIVENESS

Overall defect removal Effectiveness:

(1 – (Defects in field /total defects found)) * 100 %

Overall defect removal Effectiveness = (1 – (16 / 1081)) * 100 = **98.6%**

6. If we look at the Overall Defect Removal Effectiveness, its value is 98.6%. This value is quite high and is approximately equal to 99%.

Now, Overall Defect Removal for Inspection is calculated as follows:

= ((defects removed by inspections)/all defects) * 100
= ((50+111+154+466)/1081)*100
= **72.24%**

& the Overall Defect Removal for Testing is:
= ((defects removed during testing) / (defects removed during testing and later stages))*100
= ((135+88+61)/ (135+88+61+16))*100
=**94.66%**

From above calculations it is evident that reviews and inspections were effective as it removes 72.24% defects and also overall defect removal rate is 94.66%, which means almost 95% of defects are removed. It is clear that the inspection and reviews of the testing phase are more effective.

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7. The number of defects originated in requirement phase = 217

If the number of defects originated in requirement phase increased by 20% (20% of 217 = 43.4), the result will be 260. 4

The number of defects detected in the requirement phase = 50

If the defects detected in requirement review increased by 50% (50% of 50 = 25), the result will be 75

There is a difference in the number of defects escaped from requirement review phase and total defect injected till this phase. So the total defects removed till this phase will be

Defects Escaped = 260 – 75 = 185

So the defects escaped is now increased by 185-167 = 18, so to the next following phase, 18 more defects are passed.

But in the coding phase the number of defects originated is still the same i.e. 551, so as a result it remains unaffected.

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8. No Impact for smaller number of bad fixes

Negative impact for larger number of bad fixes.

example: Integration Testing:
Actual Value for the defects originated in design phase is: 177

Actual Value for the defects detected in coding phase is: 466
Actual Value for defects existing at step entry for this phase is:
(217+ 124 + 177 + 551+4 +3) – (50 + 111 + 154 + 466+135+88) => 72

Actual DRE for “Integration Testing” phase is : 53.33 %

Changed value for the defects originated in design phase is: (177) * 1.3 => 230.1
Changed value for defects detected in coding is: (466) * 1.10=>512.6
Changed value for defects existing at step entry for this phase:
(217 + 124 + 230.1 + 551+4+3) – (50 + 111+ 154+ 512.6 + 135 + 88) => 78.5 ~ 76
Changed DRE for “Integration Testing” phase is=> 88/(3 + 76) => 45.22%