

# *Listening to Your Defects*

*The Wisdom of Bugs Revealed*



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# *Listening to Your Defects*

- ❖ Yogi Berra: “You can observe a lot just by watching”
- ❖ Defects can tell us a lot about...
  - ❑ Our projects
  - ❑ Our products
  - ❑ Our process
- ❖ Let’s see what your defects are telling you, and what they’re not telling you...

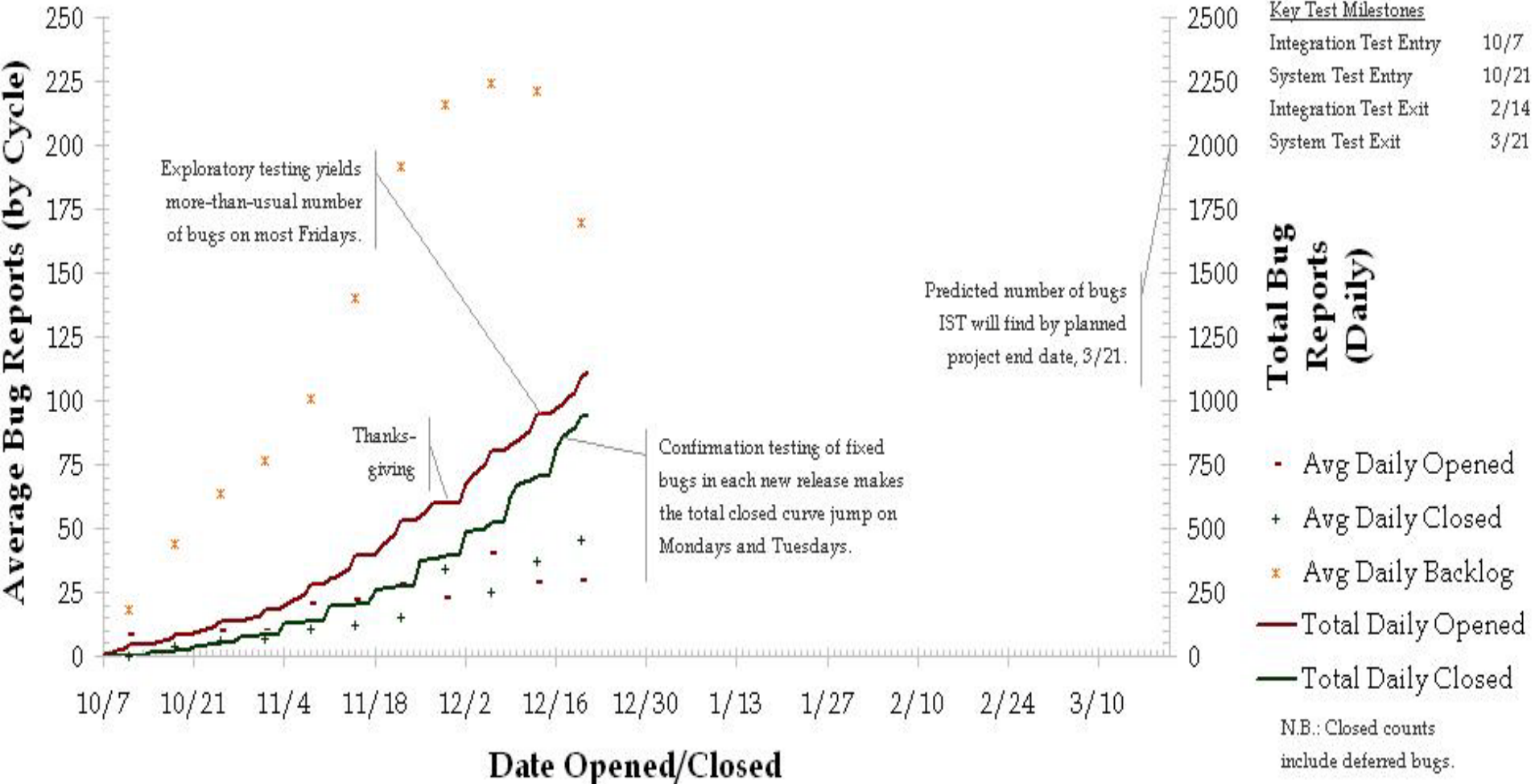


## *What Defects Say about Your Project*

- ❖ Key exit criteria for testing (and thus a release criteria) often involve defect metrics
  - ❖ Are we done finding bugs?
  - ❖ Have the important bugs been resolved?
- ❖ Timely entry of defect data is essential to generate accurate reports and make smart decisions



# Sumatra Integration and System Test Execution Phases System Quality Problems Analysis



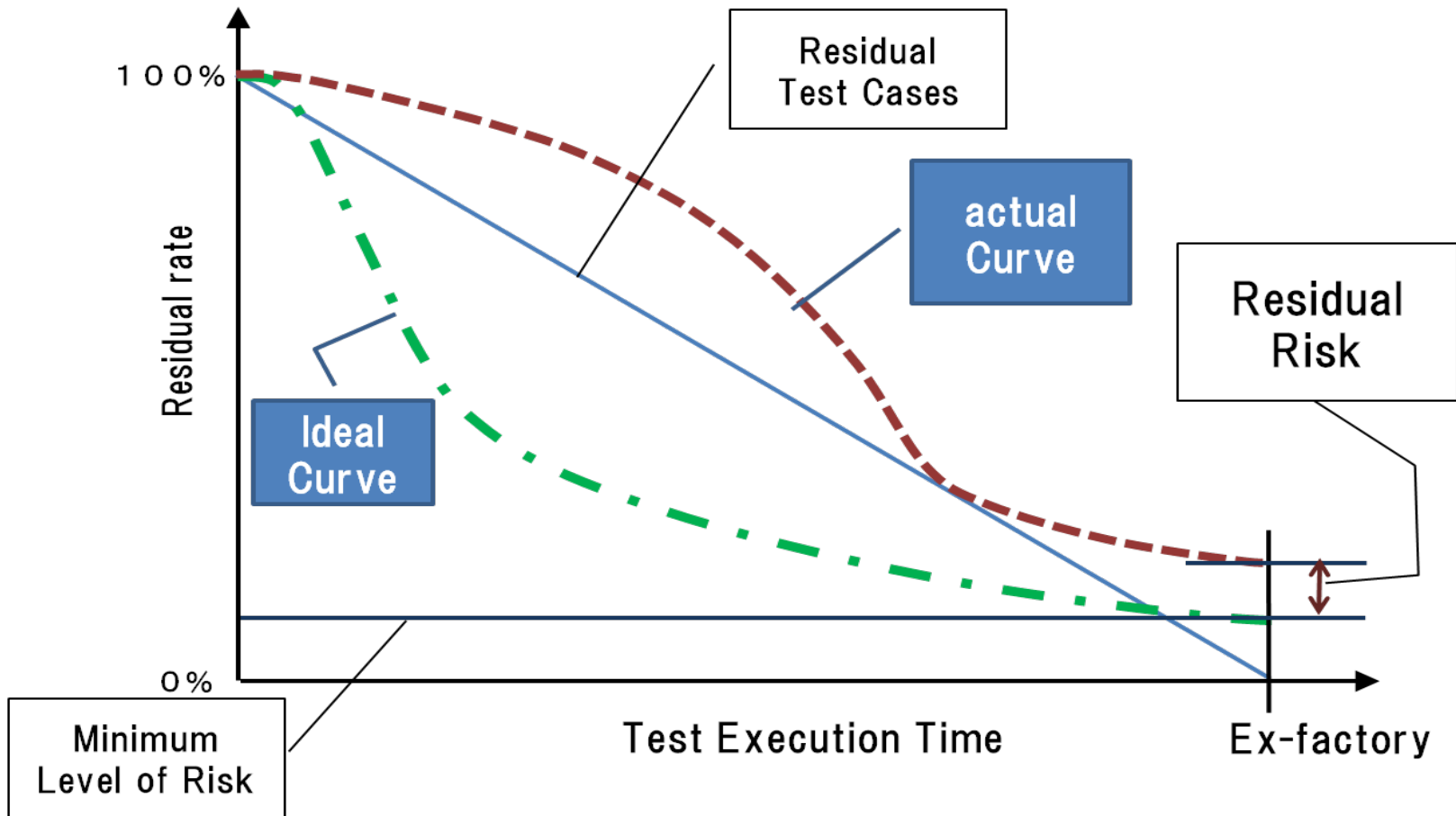


# *What Defects Say about Your Product*

- ❖ Defects can tell you a lot about your product
  - ❖ What is the level of quality risk?
  - ❖ Where are the defect clusters?
- ❖ Enlightened project management teams can make decisions with this data:
  - ❖ Smart release decisions
  - ❖ Product improvement decisions



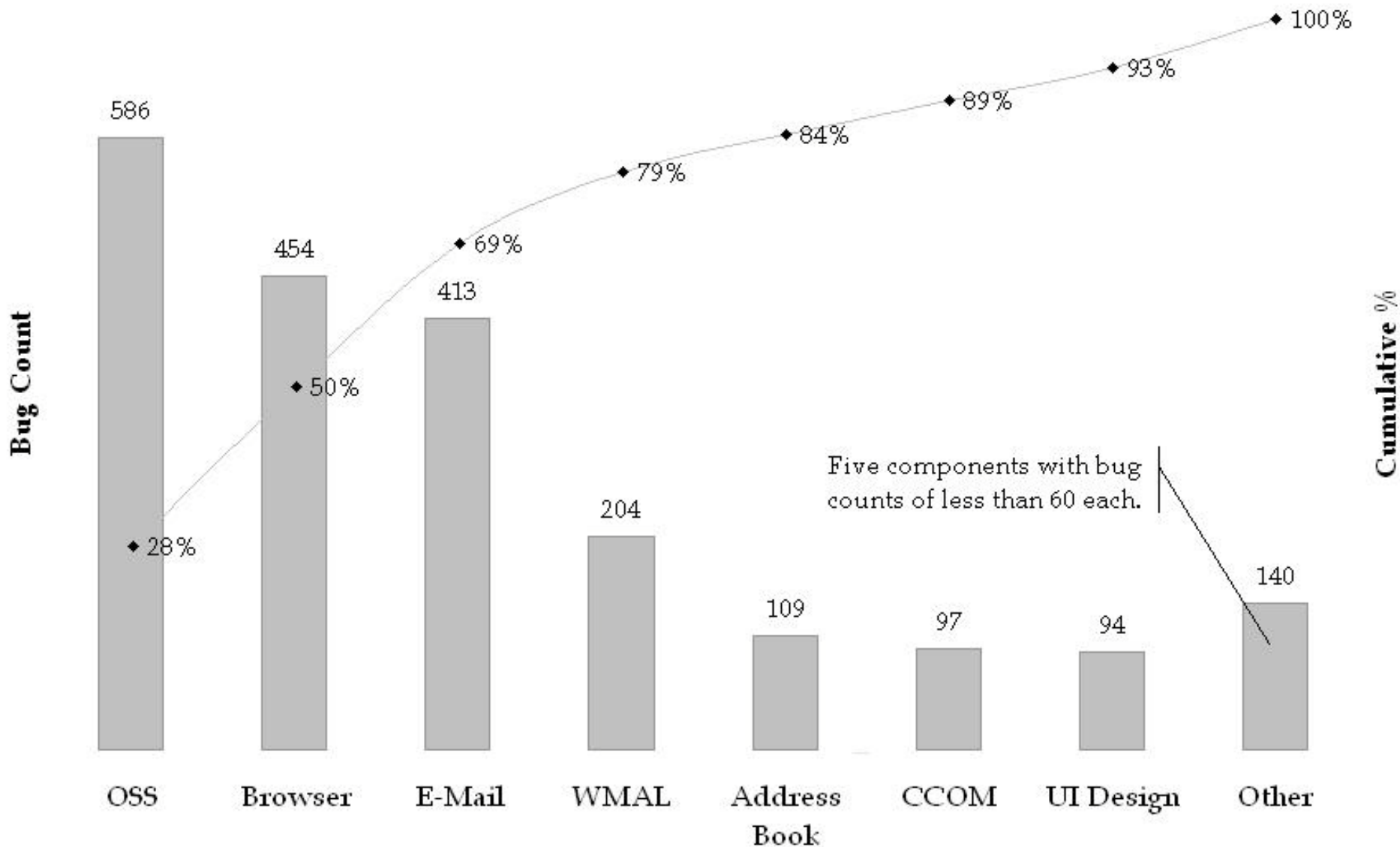
# Quality Risk



Thanks to my co-author Atsushi Nagata of Sony for this figure.



# Clustering of Bugs by Component





# *What Defects Say about Your Process*

- ❖ Software engineering is a human process
- ❖ All human processes are fallible
- ❖ Understanding the true costs of mistakes and where those mistakes come from leads to true understanding:
  - ❖ Process capability
  - ❖ Potential for process improvement
- ❖ Essential process data includes cost of quality and phase containment



# *Cost of Quality*

- ⊕ Cost of quality is a good way to measure quantitative value and efficiency
- ⊕ Cost of quality classifies quality costs in four categories
  - ⊞ Costs of prevention
  - ⊞ Costs of detection
  - ⊞ Costs of internal failure
  - ⊞ Costs of external failure
- ⊕ Testing budget is part cost of detection, part cost of internal failure
- ⊕ Detection and internal failure are typically cheaper than external failure, making testing an excellent value



# Example of Cost of Quality

<i>Detection Costs</i>		<i>External Failure Costs</i>	
Test Budget	\$1,000,000	Sustaining Costs	\$3,000,000
Future Value of Assets	100,000	Percentage Bug-Related	50%
Re-test Costs	500,000		
<b>Net Detection Costs</b>	<b>\$400,000</b>	<b>Net Ext. Failure Costs</b>	<b>\$1,500,000</b>
<b>Must-Fix Test Bugs</b>	<b>1,500</b>	<b>Must-Fix Released Bugs</b>	<b>500</b>
<b>Detection Cost per Bug</b>	<b>267</b>	<b>Ext. Failure Cost per Bug</b>	<b>3,000</b>
<i>Internal Failure Costs</i>		<i>Return on Investment</i>	
Test Bug Fix Costs	750,000	Must-Fix Test Bugs	1,500
Re-test Costs	500,000	Money Saved Per Bug	\$1,900
<b>Net Int. Failure Costs</b>	<b>\$1,250,000</b>	<b>Net Benefit of Testing</b>	<b>\$2,850,000</b>
<b>Must-Fix Test Bugs</b>	<b>1,500</b>	<b>Net Detection Costs</b>	<b>400,000</b>
<b>Int. Failure Cost per Bug</b>	<b>833</b>	<b>Test ROI</b>	<b>713%</b>

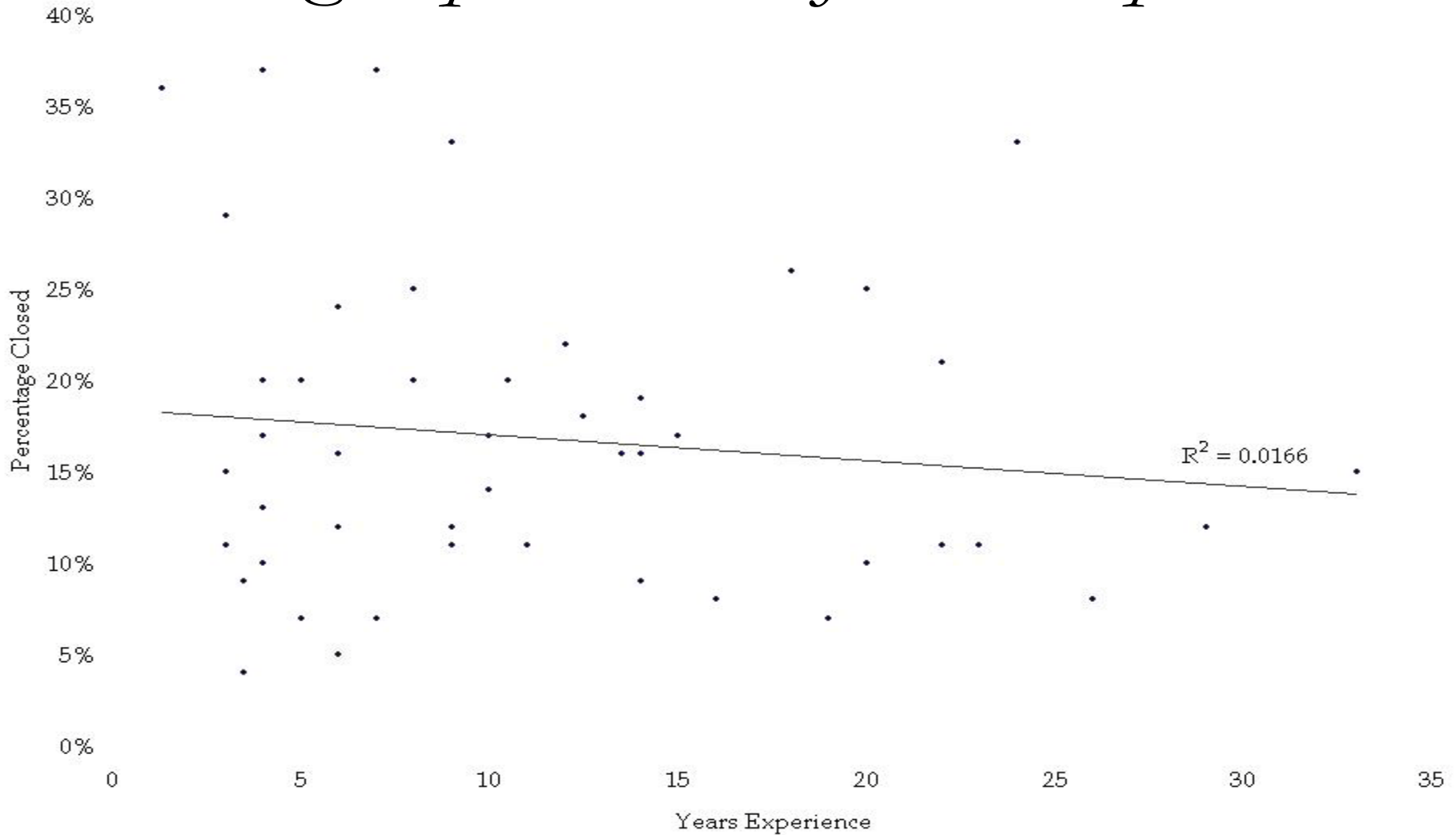


## *Mis-hearing Your Defects*

- ❖ When you listen to your defects, pay careful attention to what they're actually saying
  - ❖ For example, don't make the mistake of rewarding or punishing people for bugs
  - ❖ People will respond to incentives, and that will corrupt the data
- ❖ Don't mistake process metrics for people metrics



# *“Bad Bug Reports Arise from Inexperience”*





# *How to Listen to Defects*

- ❖ Log 'em!
- ❖ Classify 'em!
- ❖ Understand where they are introduced, where they are detected, and where they are removed
- ❖ Keep the data clean
- ❖ Train people how to use the classifications



# *Conclusions*

- ❖ Defects can tell us a lot...
  - ❖ About projects
  - ❖ About products
  - ❖ About processes
- ❖ Be careful not to misinterpret what your defects are telling you
- ❖ Listening to your defects can help you optimize outcomes across a range of activities
- ❖ Strike up a conversation with some bugs when you get back to work!



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