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**Optimizing the Defect Lifecycle –  
Resolution**

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**NIST 2002-10 Report**

- ❖ According to a study commissioned by the National Institute of Standards and Technology:
  - ❖ Software errors cost the U.S. economy an estimated \$59.5 billion annually, or about 0.6 percent of the gross domestic product
  - ❖ 80 percent of the software development costs of a typical project are spent on identifying and fixing defects
  - ❖ About one-third of these costs, or an estimated \$22.2 billion, could be eliminated by an improved testing infrastructure

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## The Defect Lifecycle Silverpath Technologies

- ❖ One of the foundation processes in any company that produces software
- ❖ Can be the only description of how the project team interact
  - ❖ There can be a lot of back-and-forth in addressing the issues

The diagram, titled 'Project Communication Hub', features a central circle with four segments: 'Status' at the top, 'Defects' on the left, 'Issues' at the bottom, and 'Progress' on the right. Arrows indicate a clockwise cycle between these segments. An arrow labeled 'Tasks' points into the circle from the left. Two arrows labeled 'Ready' and 'Complete' point out of the circle to the right.

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## Simplified Roles in Project Team Silverpath Technologies

- ❖ **Product Manager** must decide product behaviour
- ❖ **Project Manager** negotiates priorities/scope vs. constraints (schedule, resources, etc)
- ❖ **Business Analysts** describe the product behaviour for Development and Testing
- ❖ **Development** implements the described product behaviour
- ❖ **Testing** verifies the implemented product behaviour against what was described, connecting the other roles with information

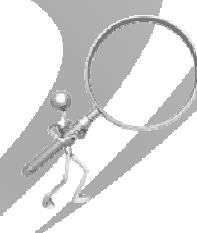
The diagram, titled 'Simplified Project Team Interfaces', shows five interconnected boxes: 'Product Management' (top-left), 'Business / Requirements Analysis' (top-right), 'Project Management' (bottom-left), 'Development' (bottom-right), and 'Testing' (center). Arrows show the flow of information: 'Decided Product Behaviour' from Product Management to Business / Requirements Analysis; 'Defined Product Behaviour' from Business / Requirements Analysis to Development; 'Scope Priorities Constraints' from Project Management to Development; and bidirectional arrows connecting Product Management, Business / Requirements Analysis, Project Management, and Development to the central Testing box.

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# So, You Have Found A Bug

- ❖ What happens next?
  - ❖ How is that quality report is handled?
  - ❖ How is it investigated?
  - ❖ How is it determined to be resolved?
- ❖ How do we track and lower the costs of these activities?



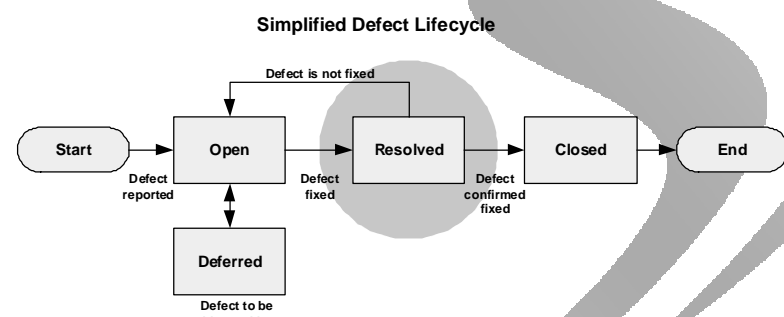
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# Leverage Defect Resolution

- ❖ Obtain an accurate picture of the defect counts by providing the right set of choices
- ❖ Drive ownership and closure of the issue through an “automated” process

**Simplified Defect Lifecycle**




```

    graph LR
      Start([Start]) -- "Defect reported" --> Open[Open]
      Open -- "Defect fixed" --> Resolved[Resolved]
      Resolved -- "Defect confirmed fixed" --> Closed[Closed]
      Closed --> End([End])
      Open -- "Deferred" --> Deferred[Deferred]
      Deferred --> Open
      Resolved -- "Defect is not fixed" --> Open
    
```

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## Example Defect Resolutions




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- ❖ **Fixed:** the programmer says it's fixed. Check it.
- ❖ **Cannot Reproduce:** The programmer can't make the failure happen. Add details, and notify the programmer. Also known as Not Repro.
- ❖ **Deferred:** It's a bug, but it will be fixed later.
- ❖ **As Designed:** The program works as it's supposed to. Also known as By Design.
- ❖ **Need Info:** The programmer needs more info about the bug.
- ❖ **Duplicate:** This is a repeat of another bug report (cross reference it on this report.)
- ❖ **Withdrawn:** The person who reported this bug is withdrawing the report.

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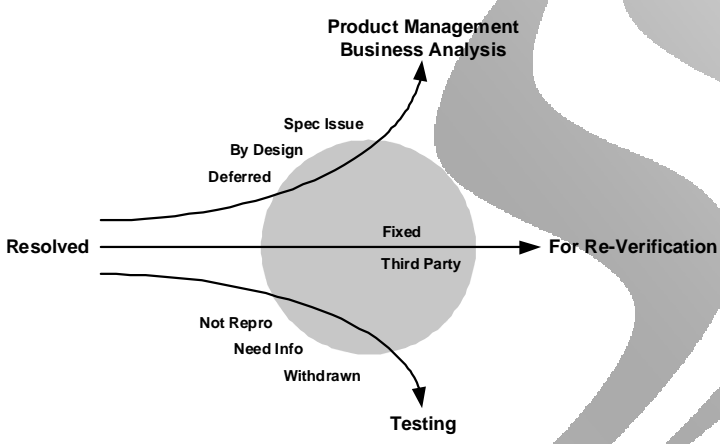
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## Process Implications



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**Automated Responsibility Assignment**




The diagram illustrates the flow of defect resolutions. A central 'Resolved' box has three outgoing arrows: one to 'Product Management Business Analysis' (labeled 'Spec Issue', 'By Design', 'Deferred'), one to 'For Re-Verification' (labeled 'Fixed', 'Third Party'), and one to 'Testing' (labeled 'Not Repro', 'Need Info', 'Withdrawn').

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## Common Defect Report Attributes



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Resolution is just one of any number of attributes

<ul style="list-style-type: none"> <li>❖ Status</li> <li>❖ Assigned To</li> <li>❖ Priority</li> <li>❖ Severity</li> <li>❖ Functional Area</li> <li>❖ Feature</li> <li>❖ How Found</li> <li>❖ Type</li> </ul>	<ul style="list-style-type: none"> <li>❖ Environment</li> <li>❖ <b><u>Resolution</u></b></li> <li>❖ Opened Version</li> <li>❖ Opened By</li> <li>❖ Opened Date</li> <li>❖ Related Test case(s) or Requirement(s)</li> <li>❖ History or Audit Trail</li> </ul>
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What other opportunities for efficiency exist?

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## Defect Lifecycle Optimization Tips



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- ❖ An effective defect lifecycle ensures that:
  - ❖ The highest percentage of valid and unique defects are being reported
  - ❖ Total time required to address each defect is minimized
  - ❖ The right role in the project team is making the decision for each next step of the defect lifecycle
- ❖ Improved definition and analysis of the data captured can drive improvements in processes and training, resulting in more successful projects

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## About Silverpath Technologies



- ❖ Silverpath Technologies is founded on the principle vision to provide high value to software companies by raising the quality of their software systems and teams while simultaneously driving down the total costs to achieve that quality.
- ❖ Within this vision, Silverpath seeks a highly collaborative relationship with each customer, providing results-centric consulting and training services, where each focus is driven by the emphasis on improving the effectiveness and efficiency of quality and testing activities across the software development lifecycle through the application or modification of processes, techniques and tools.
- ❖ Visit <http://www.silverpath.com> for more information.

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