Model Based Testing
A technology shift

Innovation Summit
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Agenda

• The testing value proposition
• The Model Based Testing process
• Value of Model Based Testing
• Barriers to Model Based Testing
The testing value proposition

- Testing is expensive
  - 30-50% of development costs
- Poor testing is VERY expensive
  - Down time
  - Maintenance costs
  - Rework
  - Law suits
- Model Based Testing promises
  - Increased effectiveness of testing
  - Similar or decreased costs
Downtime Costs (per Hour)

- Brokerage operations $6,450,000
- Credit card authorization $2,600,000
- Ebay (1 outage 22 hours) $225,000
- Amazon.com $180,000
- Package shipping services $150,000
- Home shopping channel $113,000
- Catalog sales center $90,000
- Airline reservation center $89,000
- Cellular service activation $41,000
- On-line network fees $25,000
- ATM service fees $14,000
Model Based Testing

Costs of fixing a bug

- Percentage of Bugs
  - Coding: 85%
  - $25
  - Unit Test: $130
  - Funct Test: $250
  - Field Test: $1000
  - Post Release

- Costs of fixing a bug
  - Introduced: (Apar $15-40,000)
  - $14,000

- $ Cost to repair defect in this phase
  - Introduced in
  - 85%

Source: Applied Software Measurement, Capers Jones, 1996
Classical V Process

- Specification
- Design
- Implementation
- System testing
- Function testing
- Unit testing

Model Based Testing
Model Based Testing Process

1. Create Model
2. Create Directives
3. Generate Test Suites
4. Review
5. Execute Test
6. Analyze and Feedback

Specifications
Test Objectives
Test Architecture
Behavior Model
Generation Directives
Execution Directives
Test Suite
Unit Under Test
Test Results
Values of Model Based Testing

- **Starting from specification**
  - Involves testers early in the development process
  - Teams testers with developers
  - Forces testability into product design
- **Building the test interface**
  - Finds design and specification bugs - before code exists
  - The model is the test plan - and is easily maintained
- **Automated test suite generation**
  - Coverage is guaranteed - increases testing thoroughness
  - Zero test suite maintenance costs
- **Automated test suite execution**
  - Finds code and interface bugs
  - Includes a framework for the testing of distributed applications
  - Reduces test execution costs
Industrial Evidence

- Retest of functions
- Modelling and translation by testers
- Comparison
  - Original test: 18 bugs, 12 PM
  - Pilot test: 15 original bugs + 2 escapes, 10 PM (INCLUDING learning curve)
- Conclusions:
  - Efficient way to free the tester for creative testing
  - Replaces a large part of the manual test case writing

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Barriers to Model Based Testing

• Process shift
  – Up front investment in test

• Personnel shift
  – Higher education and sophistication

• Tools
  – Still bleeding edge
Model based testing - Summary

• A new methodology supported by tools
• Provides technological and sociological benefits
• Industrial evidence for its value
• Hidden evidence of its failures
• Keys to success:
  – Staffing
  – Management support
  – Tooling
More information at

- www.goldpractices.com/practices/mbt/
- www.geocities.com/model_based_testing/
- www.agedis.de/downloads
Thank You