Conventional & Unconventional Dimensions of Metrics in an Outsourced Engagement

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L&T Infotech
Company Overview

Software Testing Trends

Test Outsourcing

Common IV&V Services and Solutions

Customer Expectations

Conventional Measures & Metrics

Unconventional Measures & Metrics
**Company Overview**

**Larsen & Toubro Limited**

- Established in **1938**, European roots
- **Technology focused** diversified business portfolio
- Revenues: $5 billion
- 35,000+ employees world-wide
  - 40 factories, 30 offices
- 150+ International Collaborations & JVs
- Forbes 2000 Company

**Larsen & Toubro Infotech**

- Global IT services company
- 15 International Offices
- 14+ yrs of international experience
- **NASSCOM - Top 9** Indian IT Exporters
- Strong Insurance domain experience
- 18 out of Fortune 100 clients
- 8000+ IT Professionals

**Corporate Certifications**

- SEI CMMI Level 5
- ISO 9001
- Six Sigma Certification
- P-CMM Level 5

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Software Testing Trends

Independent Verification and Validation (IV & V)

- Increasing trend of an independent testing provider, akin to..
  FOX TAKING CARE OF THE HEN - Forrester

Testing Trends

- ‘V Model’, ’W’ Model, Agile Testing
- Risk Based Testing, Test Driven Design
- Focus on early defect detection
- V & V of development life cycle

![Cost of correcting defects](image)


Fixing bugs later is 100 times more expensive than finding and fixing bugs during the requirement and design stage.
Test Outsourcing

Key Facts

- Software bugs cost $59.5 billion to the US economy - US Department of Commerce
- 45-50% getting outsourced - Gartner
- Testing services growth rate - more than 50%
- Offshore outsourced testing business in India ~ $1 billion by end of 2007 - META Group study

Frequently Outsourced

- Functional, ETL, DW, Backend
- Test Automation, SOA
- Performance, Load, Penetration (Security)
- Product, Package Implementation
- Test & Process Consultancy

Frequently Not Outsourced

- UAT Testing
- White Box Testing
- Business Process Testing
- Risk based Testing
- Test Driven Design
Common IV&V Services and Solutions

Services

- Functional
- Non-Functional
- Product
- Testing Process Consultancy

Solutions

- Automation Frameworks
- Test Harness
- Test Beds
- Metrics
Expectations

Customer

**Senior Mgmt**
- ✓ Cost Reduction
- ✓ ROI
- ✓ IT-Business Alignment
- ✓ Thought Partnership

**Middle Mgmt**
- ✓ IQR
- ✓ Cost of Quality
- ✓ Optimization
- ✓ Engagement Benefit

**Product/Project Mgmt**
- ✓ Quality Process
- ✓ Tools
- ✓ Domain Savvy

Vendor

- ✓ Growth Opportunities
- ✓ Outsourcing Maturity
  - ✓ Quality Process Compliance
  - ✓ Testing Process Compliance
Conventional Measures

Common SDLC Metrics

- Project Effort
- Project Cost
- Project Risk
- Project Schedule
- Project Productivity
- Defect related Metrics
Conventional Measures

Testing Measures

- Test Process Efficiency
- Test Productivity
- Cost of Testing
- Test Coverage
- Test Effectiveness

Quality of Software

Common Measurement Frameworks

- Goal/Question/Metric Paradigm
- Quality Function Deployment
- Software Quality Metrics
### Conventional Metrics

#### Testing Measures & Metrics

<table>
<thead>
<tr>
<th>Measure</th>
<th>Metrics</th>
</tr>
</thead>
</table>
| Test Process Efficiency    | • Process Compliance  
                          | • Resource Allocation and Utilization                                   |
| Test Productivity          | • Schedule Variance  
                          | • Effort Variance                                                      |
| Cost of Testing            | • Direct Cost  
                          | • Indirect Cost                                                       |
| Test Coverage              | • Requirement Coverage  
                          | • Code Coverage                                                       |
| Test Effectiveness         | • Residual Defect Density  
                          | • Defect Distribution (Severity)  
                          | • Defect Rejection                                                    |
| Test Transformation        | • Automation Ratio  
                          | • Onsite-Offshore Ratio                                               |
Defect Trend Metrics

Application Defect Trend Analysis

<table>
<thead>
<tr>
<th>Month/Cycle</th>
<th>Defects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cycle1 Oct-06</td>
<td>0</td>
</tr>
<tr>
<td>Cycle1 Nov-06</td>
<td>5</td>
</tr>
<tr>
<td>Cycle2 Nov-06</td>
<td>10</td>
</tr>
<tr>
<td>Cycle3 Nov-06</td>
<td>15</td>
</tr>
<tr>
<td>Cycle1 Jan-07</td>
<td>20</td>
</tr>
<tr>
<td>Cycle1 Feb-07</td>
<td>25</td>
</tr>
<tr>
<td>Cycle1 Mar-07</td>
<td>30</td>
</tr>
</tbody>
</table>

Legend:
- Critical Severity
- High Severity
- Medium Severity
- Low Severity
- Undecided
- Total
Conventional Metrics

Quality Process Compliance

Quality Process Compliance

- Reviews
- Audits
- Goals

Cycle 1: Reviews increasing, Audits constant, Goals stable.
Cycle 2: Reviews and Audits decrease, Goals decrease.
Cycle 3: Reviews decrease, Audits increase, Goals stable.
Cycle 4: Reviews increase, Audits increase, Goals increase.
Unconventional Measures

Do we Measure?

✓ Testability of Software
✓ Quality of Test cases
✓ Testing ROI
✓ Reliability
✓ Domain Knowledge
✓ User Satisfaction
✓ IT-Business alignment
✓ Business process optimization level
✓ Business process fragmentation across applications
## Unconventional Measures & Metrics

<table>
<thead>
<tr>
<th>Measure</th>
<th>Metrics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Testability of Software</td>
<td>• Controllability</td>
</tr>
<tr>
<td></td>
<td>• Observability</td>
</tr>
<tr>
<td>Quality of Test cases</td>
<td>• Test case Impact</td>
</tr>
<tr>
<td></td>
<td>• Test case Reusability</td>
</tr>
<tr>
<td></td>
<td>• Test case Conformity</td>
</tr>
<tr>
<td>Engagement Efficiency</td>
<td>• Engagement Cost Benefit</td>
</tr>
<tr>
<td>User Satisfaction</td>
<td>• User Satisfaction Survey</td>
</tr>
<tr>
<td>Domain Knowledge</td>
<td>• Domain Certification</td>
</tr>
<tr>
<td>Business Impact</td>
<td>• Risk based Testing</td>
</tr>
<tr>
<td></td>
<td>• Test Driven Development</td>
</tr>
</tbody>
</table>
Unconventional Metrics

Testability Metrics

Controllability

- Controlled
- Partially Controlled
- Not Controlled

Observability

- Directly Visible O/P
- Indirectly Visible O/P
- O/P not visible
- Visible States
- Not Visible States

Units

Project Timeline
Risk Based Testing Metrics

Unconventional Metrics

Residual Risks

Progress through the test plan

start

today

Planned end

all risks 'open' at the start

residual risks of releasing TODAY
References

- Measuring the Effectiveness of Test, by Harry M. Sneed
- Heuristics of Software Testability, by James Bach
- Risk based Testing, by Hans Schaefer
This presentation contains contributions from my following colleagues in terms of their thoughts, experience, expertise and time.

- **Deepesh Belani**  
  Lead, IV & V practice

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- **Rajesh Bharathan**  
  Head IV & V Practice - Insurance, L&T Infotech
Thank You