Emerging Trends in Test Automation

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Date:

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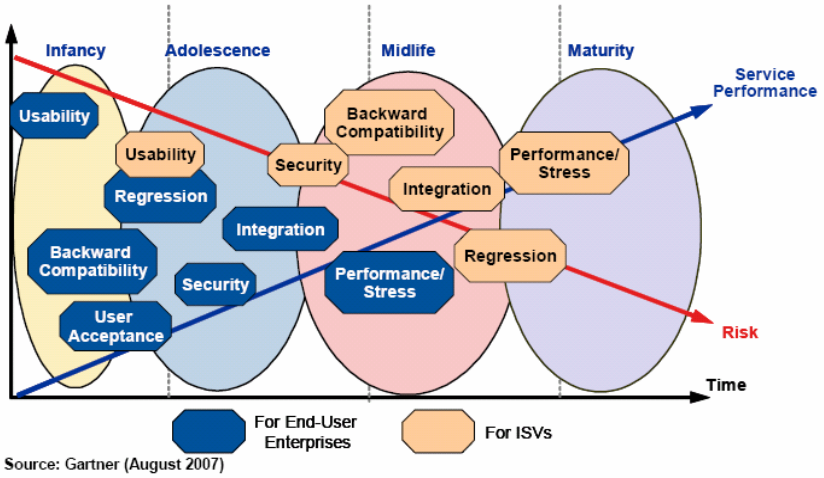
Introduction to Automation

Offshore Testing Services Maturity

Figure 1. Offshore Testing Maturity



Source: Gartner (August 2007)

Offshore Application Testing – ID G00150394 dated 17th August 2007

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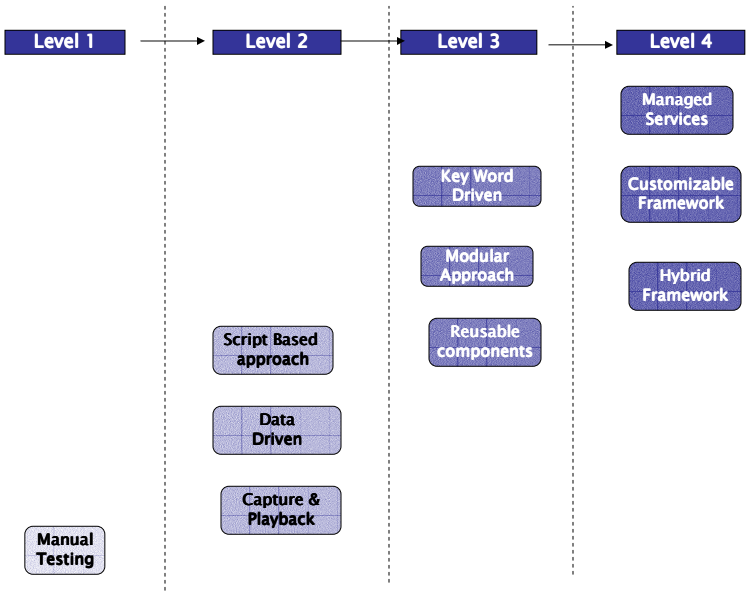
Maturity of Automation Testing



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Test Automation: Introduction

- Automation: Facts
  - Manual scripts needed
  - Ideal for regression testing
  - Benefits come from discipline in analysis and planning
  - Causes significant schedule impact at introduction
  - Require more programming and design skills from testers
  - Frequently require maintenance
- Automation: Myths
  - High immediate ROI from automation
  - One tool that fits perfectly
  - Need to substitute skilled manual testers
  - Preclude manual testing
  - 100% Automation of all existing manual tests

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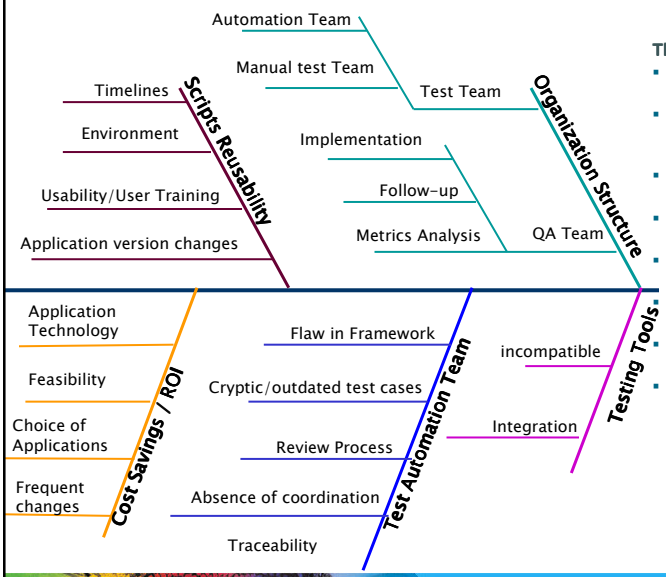
RCA Analysis – A Case Study

The challenges that a customer, a leading service provider in EMEA, faced during automation



The Solution Approach

- Identifying the applications for Automation
- Selection of automation percentage for identified applications.
- Selection of the compatible tool for AUT
- Customization of tool/creation of framework
- Development of reusable/modular components
- Creation of user-friendly process for running the scripts
- Maintenance and enhancement process
- Continuous metrics collection and analysis

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WIPRO

Building a Test Automation Framework

Test Automation Framework: Approach

WIPRO

Phase 1 : Discovery

- Understand the current Test Automation practices, identify gaps, prioritize, develop roadmap

Phase 2: Automation Process Definition

- Prepare skeleton model of the framework based on appropriate systems, methods, and infrastructure

Phase 3: Framework Development

- Identify the key components of the Framework, create the scripting standards, identify the reusable components, document the metrics analysis and approach

Phase 4: Verification

- Conduct in-process and independent Verification on the robustness of the framework.

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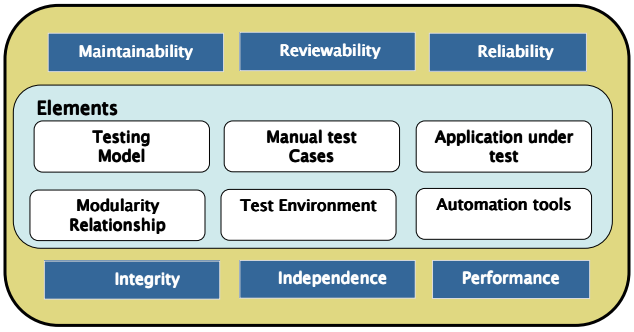
Test Automation Framework: Considerations



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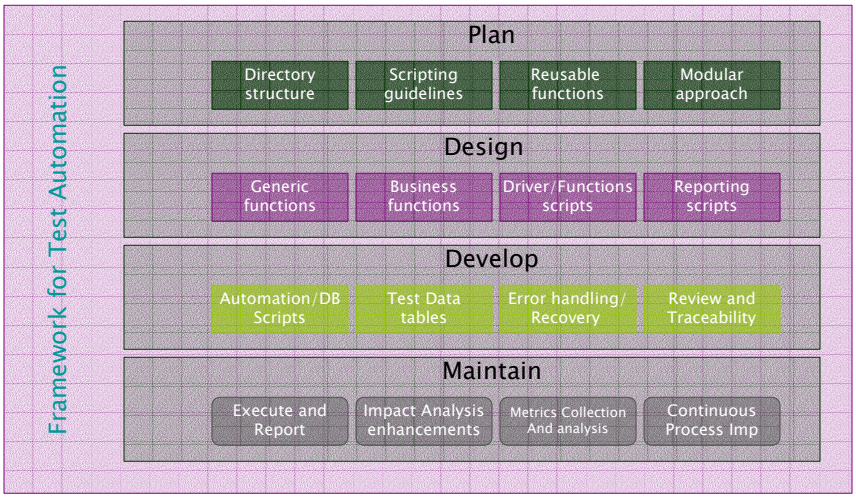
Test Automation Framework: Components



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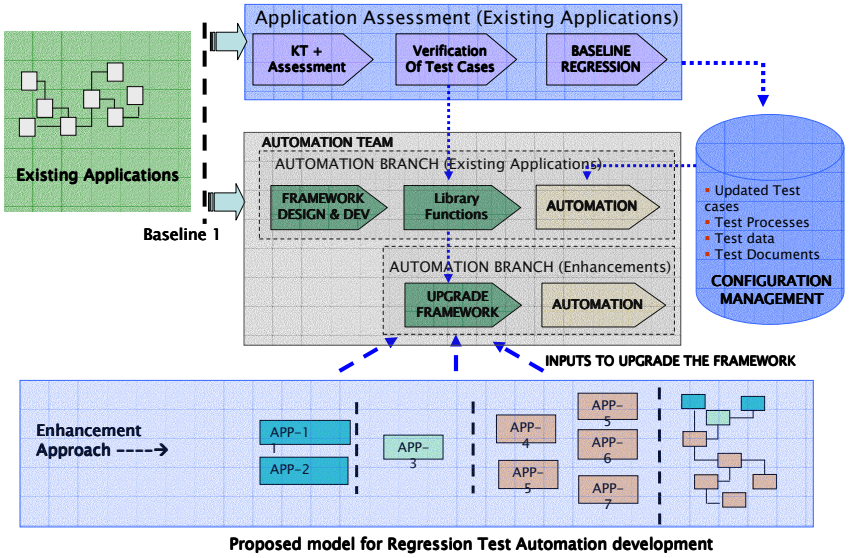
Test Automation Framework: Design



Proposed model for Regression Test Automation development

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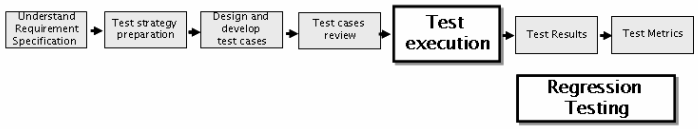
Wip-CAFÉ: Wipro's Framework

Test Automation helps in Test Execution/Regression Testing during the Testing Life Cycle



Challenges in Test Automation

- Frequent changes in the GUI
- Reusability & high scripting effort
- Automation expertise
- Requirements Capturing
- Varied GUI applications & automation tools
- Test Data Design
- ROI Tracking at organizational level
- Test Automation Lifecycle Management

The Solution – Wip-CAFÉ

<<Test Case Automation Management>>

- ✓ Enables GUI-independent automation
- ✓ Enforces best practices
- ✓ Facilitates test automation management across the organization
- ✓ Comprises of a library of standard components
- ✓ Contains an ROI tracking module and generates reports

Significant Benefits

- ✓ Easy generation of test scripts
- ✓ Can be used across different modules/projects
- ✓ Drives better productivity and ROI
- ✓ Contains an ROI tracking module and generates reports
- ✓ Significantly reduces re-work effort and increases maintainability
- ✓ Reduces investment in automation tools

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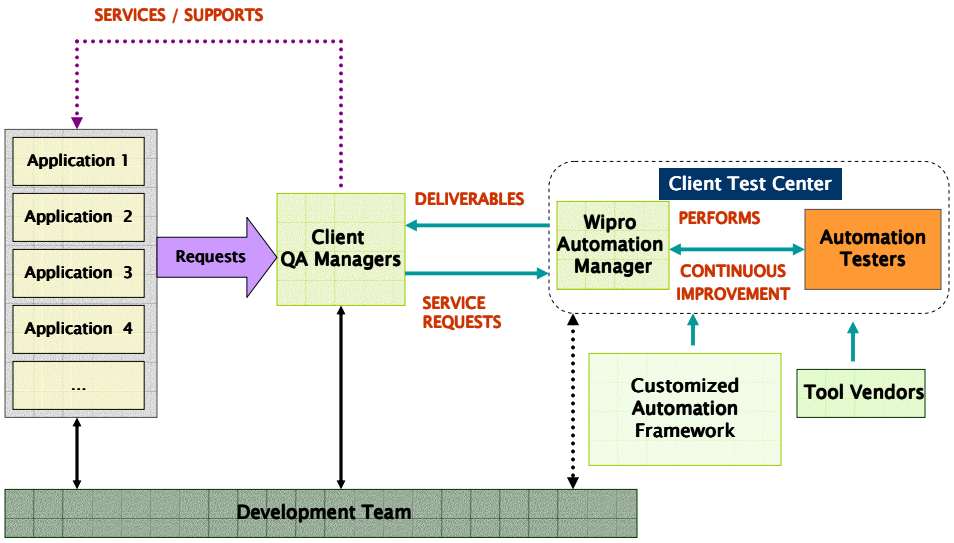
Test Automation: Managed Services Model



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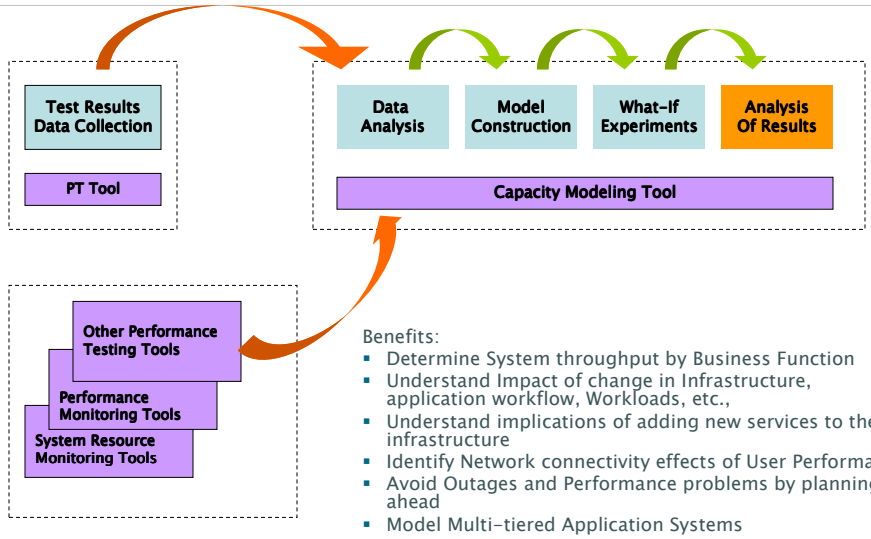
Test Automation: The emerging areas

Automation in Capacity Modeling



Benefits:

- Determine System throughput by Business Function
- Understand Impact of change in Infrastructure, application workflow, Workloads, etc.,
- Understand implications of adding new services to the infrastructure
- Identify Network connectivity effects of User Performance
- Avoid Outages and Performance problems by planning ahead
- Model Multi-tiered Application Systems

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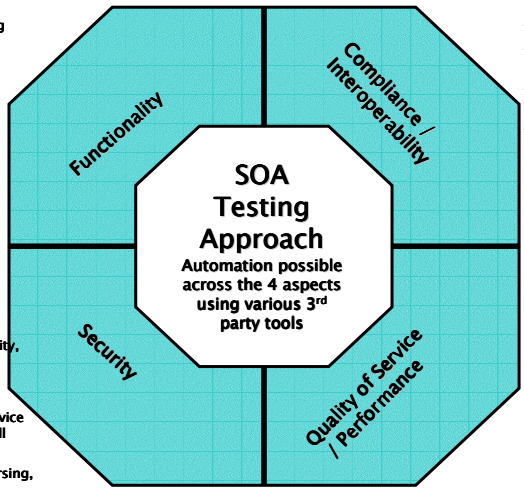
Automation in SOA Testing

- Individual component testing
- Integration, and End-to-End workflow testing
- Positive, Negative testing, Boundary value testing
- Testing of SOAP messages / responses



- Interoperability Testing
- W3C, WS-I Standards Testing
- Client's Custom Standards Testing
- Test for Consistency, and Atomicity

- Test for Identification, Integrity, Authentication, and Authorization.
- Security at transport, communication protocol, service description layer, and Firewall security
- Probing attacks, Coercive parsing, malicious contents

- Performance metrics
  - Response Time
  - Throughput
  - Latency
- Transaction Testing
- Service Reliability

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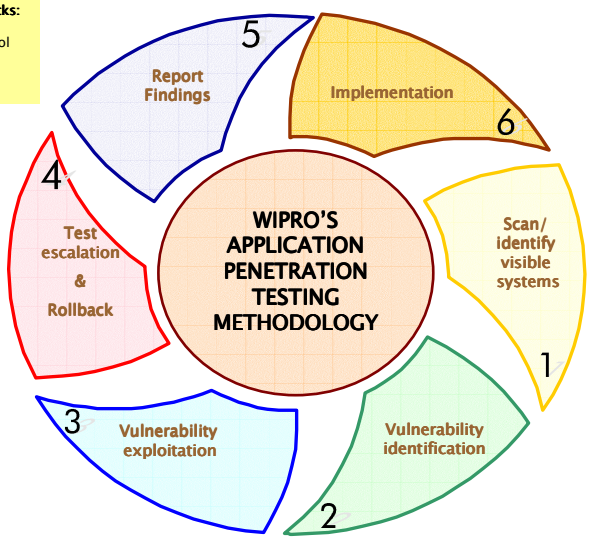
Automation in Application Security Black Box Testing

Development drawbacks:
- ✓Buffer Overflows
- ✓Broken access control
- ✓Logical Flaws
- ✓Weak encryption
- ✓Session Hijacking



Attacks possible:
- ✓SQL Injection
- ✓Cross-Site scripting
- ✓Parameter Tampering
- ✓Cookie Poisoning
- ✓Privilege Escalation

Time based Testing – Quarterly or on Application Rollouts

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In a nutshell…

Critical factors for Automation success

- Treated as a critical process and supported by senior management
- Robust and extendable automation framework
- Clear ownership and integration of test technology and process
- Rigorous measurement program to capture progress
- Skilled test engineering professionals deployed with the right tools

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