



Best Practices in Testing

Leveraging Open Source Technologies in Test Automation

Speaker Introduction



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Siva Arunachalam heads the Application Development, Maintenance and Testing services Practice at Emtec, Inc. Headquartered in Radnor, PA, Emtec, Inc. provides technology-empowered business solutions to its customers in US and Canada.

Siva has extensive experience managing and executing transformational IT programs, systems integration and Testing Centers of Excellence. Siva has held leadership positions at companies such as Accenture, Cognizant and Syntel over his 28 year career.

Siva holds degrees in Electrical Engineering and Management, and, lives in Farmington Hills, Michigan.

Agenda

Demands on QA

Commercial v/s OSS Tools Debate

Best practices in building Test Automation Framework

Guts of a Framework

Demo

Q & A

Quality Assurance and Testing: Demands and Challenges

- Companies spend over \$50B on QA and the demand is growing
- QA organizations are constantly under pressure to test more within shorter timeframes and a reduced budget.

QA Organization Demands

- Scope Increasing
 - Cross-browser compatibility – web, mobile-web
 - Regulatory compliance
 - Threat Vulnerability
- Less Time to Test
 - Rapid application development
 - Shorter product release cycles
 - Distributed development
- Increased Consequence of Defects

QA Organization Challenges

- Typical QA Effort Planned – **25%-35%**
- Whereas QA Effort Expended – **15%-20%**
- Typical Automation Coverage – **55%**
- Typical Automation Effectiveness – **65%**
- **45%** of Automation projects stalled
- **55%** of Automation projects don't achieve ROI
- Effective utilization of QA resources – **70%**

QA Organizations need a comprehensive strategy to address these challenges

WHAT DOES IT ALL MEAN?

The trend in software Quality Assurance is to do more with less, with higher stakes

Agile development methodologies are driving shorter development cycles, with an emphasis on testing

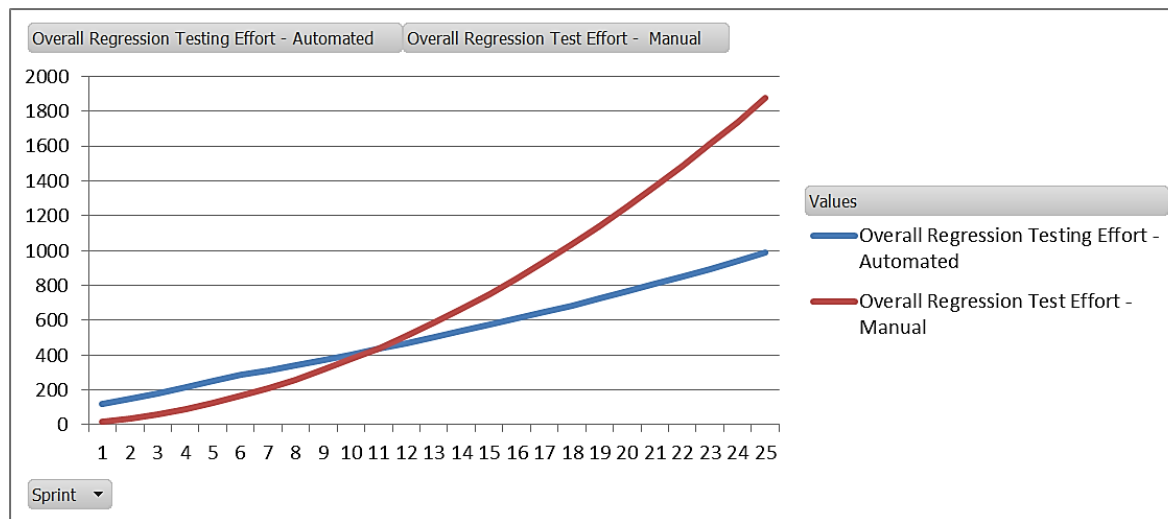
Automated testing is the logical solution to meet the challenge

QA success requires Economic solutions tailored to organization imperatives with a constant focus to improvise and adapt

Proven ROI exists for Automated Regression Testing

- Automation effort includes the development and maintenance, in addition to execution effort
- Manual test execution effort increases as new features are being added every sprint
- The graph (below) shows ROI calculations over 25 biweekly product development sprints

- Intangible benefits
 - Regression test suite can be used post Production Maintenance releases with full regression capabilities
 - Dev team can use the automated regression suite during regular sprints as part of CI
 - Increased test coverage across all future releases by having automated regression suite



- Initial Investment
- Realizing the benefit

Commercial vs. OSS Toolset?

Commercial Tools

- Pros:
 - Ease of use
 - Fully integrated suites
 - Integrations exist to SDLC Tools
 - Documentation, Training availability
 - Larger available experienced resources
- Challenges:
 - Licenses and infrastructure costs
 - Longer term ROI even with wider adoption
 - Difficulty to switch
 - Limitations in customizing / adapting

Open Source Tools

- Pros:
 - Lower TCO
 - Tool Customization / Adaptation
 - Community
 - Co-existence
- Challenges:
 - Learning Curve
 - Needs integration
 - Talent availability

Increasing number of organizations are adopting a hybrid strategy using best of breed tools to take advantage of the benefits, and, are building frameworks to provide an anchor to implement such strategies

Best Practices in Building a Test Automation Framework

- **Plan for reusability and automated verification**
 - Use case based testing – focus on commonly used scenarios
 - Support reusability of scripts – assemble scenarios using atomic scripts
 - Provide Object-based automation (minimize impact of UI layout changes)
 - Incorporate automated verification of results
- **Design for extensibility**
 - Multi-Browser compatibility testing
 - Data driven and parameterized (same script can run for multiple data conditions without need to modify scripts)
 - Cater for diverse data sources for results verification
 - Support execution against multiple environments (dev, test, stage) through configuration
- **Test Result Analytics**
 - Compare execution results across multiple runs
 - Reporting by functional components and business scenarios
 - Provide trend analysis for individual features
- **Plan for unattended execution**
 - Enable Configurable execution for unattended parallel operation
- **API testing**
 - Somewhat neglected area in test automation
 - Key element in web development where support needs to be provided on various platforms.
 - APIs are mainly used for data transfer and various key operations
 - Ability to verify each parameters and its variation in standalone manner
- **Enable extended business scenario testing**
 - Ability to use English statements (leveraging Behaviour Driven Design) to create test scenarios, empowering your business users to create dynamic scenarios
- **Tool Agnostic**
 - Plug and Play
 - Ability to work with different tools with minimal impact on test coverage

Popular Open Source Tools

End User
Defined
Testing



UI Record
and Play



Test
Execution
Framework



Project & Defect
Management



Test
Management



Continuous
Integration



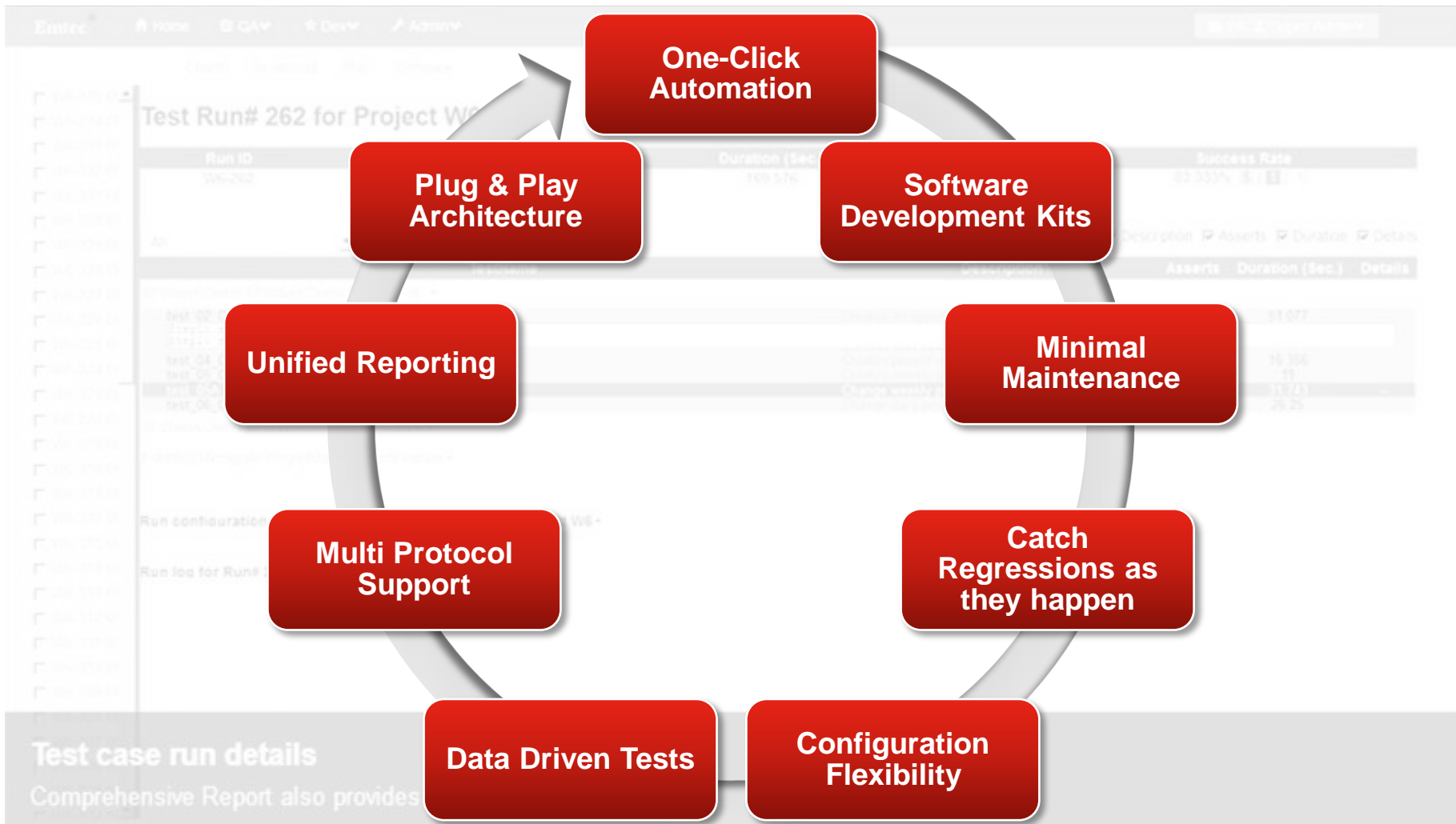
Open Source Tools and References

- Cucumber - <http://cukes.info/>
- Concordion - <http://www.concordion.org/>
- Selenium - <http://www.seleniumhq.org/>
- Watir - <http://watir.com/>
- Gallio - <https://code.google.com/p/mb-unit/>
- Nunit - <http://www.nunit.org/>
- Jenkins - <https://wiki.jenkins-ci.org/display/JENKINS/Meet+Jenkins>
- CruiseControl - <http://cruisecontrol.sourceforge.net/>
- Testopia - <https://developer.mozilla.org/en-US/docs/Mozilla/Bugzilla/Testopia>
- Testlink - <https://developer.mozilla.org/en-US/docs/Mozilla/Bugzilla/Testopia>
- Redmine - <http://www.redmine.org/>
- Bugzilla - <http://www.bugzilla.org/about/>



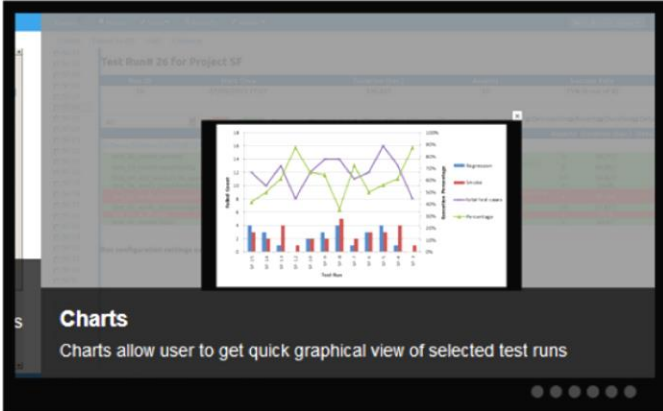
AuFait - Automation Framework for Intelligent Testing

Putting it together – an example Framework



Demo

Emtec




Charts
Charts allow user to get quick graphical view of selected test runs

Au Fait Services

- Defines**
 - Challenging Architecture for test automation
 - Plug and Play infrastructure for easier adoption into test ecosystem
 - Approach to focus on business verifications instead of automation complexities
- Improves**
 - Test automation efficiency
 - Test coverage
 - ROI of automated testing
- Reduces**
 - Code duplications
 - Script maintenance
 - Time to build new scripts

Au Fait Architecture



Multi Protocol Support

Facilitates API test harness with support for various protocols (SOAP, REST, GraphQL, etc.)

Unified Reporting

Empowers unified reporting with customizable report generation

Plug & Play Architecture

Employs plugin architecture for leveraging various open-source frameworks and tools

Support

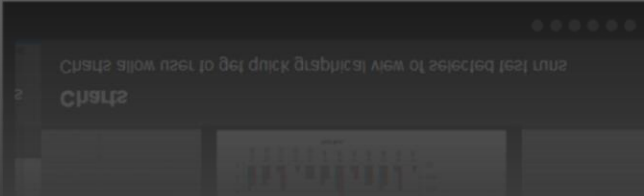
Reporting

Architecture

Multi Protocol

Unified

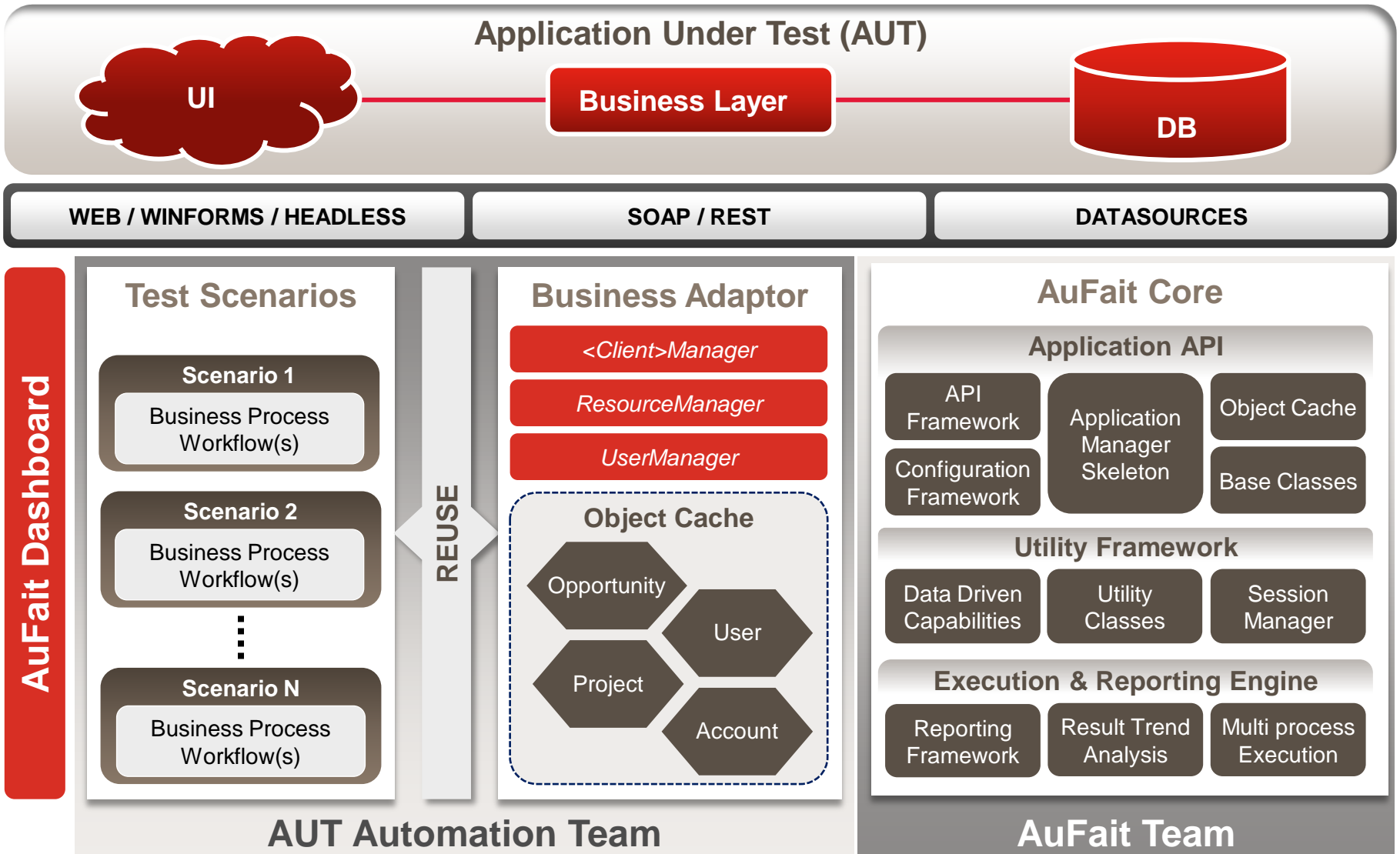
Plug & Play



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AuFait Architecture





Thank you for your time

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