**Automation Tool Interface (ATI) Design Pattern**

## Scope

This Enterprise Design Pattern (EDP) represents the technical architecture standard for using an Automation Tool Interface (ATI) to address reoccurring software development and testing problems. This version reflects the latest guidance based on industry best practices as of Fiscal Year (FY) 2024.

## Context and Problem

Product teams face numerous challenges finding ways to get test automation tools up and running in a repeatable way across product lines in Software Product Management (SPM). There is a need to have seamless access to tools enterprise-wide that can be used in different portfolios. Product line managers need to know where they can identify and select the appropriate tools depending on the business need. This includes access to tools that are provided by other groups such as the DevSecOps Tools Suite (DOTS).

## Solution

Establish and maintain an enterprise capability for Software Testing Operations (QAOps) across the product lines. QAOps helps product lines implement and maintain automated software testing solutions, by incorporating an Automation Tool Interface (ATI) into their development activities.  The ATI combines free open-source software tools currently used by OIT, with a library of functions (APIs), to create a framework that adapts to range of testing requirements and solution platforms such as Web, VistA, Windows, Section 508, and application programming interface (API) applications.  QAOps provides training and support for this proven framework which is currently incorporated in multiple Continuous Integration/Continuous Delivery (CI/CD) pipeline solutions.

## Technical Details

**Highlights**

* Developed using Java / Eclipse or other integrated development environment (IDE).
* Designed around a 3-tier architecture.
* Automation Cores (Platform Independent Cores (Automation Tool Interface))
* Page / Form Definitions / Interfaces (Application Specific)
* Test Scripts / Suites (Application Specific)
* Standardized coding practices, test data, and execution result logging
* Jira Xray repositories house tests cases, scripts, and execution results
* Supports various test script writing tools; Junit, TestNG, Cucumber, and behavior-driven design (BDD)

**Tools/Technologies**

* Java / Eclipse
* Java JAX-RS and JAXB (Middle Tier / Web Services testing support)
* Java-A11y API (Section 508 scans)
* Selenium (Automation Tool Interface; Web applications only)
* WinAppDriver (Appium) (Automation Tool Interface; Windows applications only)
* Java SSH3 Connection (VistA application)
* Maven (Dependency Management)
* GitHub Package Manager
* JIRA Xray (Test Management /Reporting)
* Test Persona Manager – Single Sign-on (SSO)
* JMeter – performance testing
* Database – Java SQL

**How to Connect to DOTS**

With ATI automation, product lines have options for integrating with their DevOps.

* DOTS has created a store front for DOTS supported tools. To get started [visit the README document](https://github.com/department-of-veterans-affairs/dots-tools-jenkins)
* ATI has created a va-ati-tenant branch in the DOTS store front for ATI builds and ATI testing using ATI to test itself. You may have seen the ATI demo showing much of this work. Product lines can leverage this work by having their own pipelines inside the va-ati-tenant Jenkins. Reach out to QAOps for how to leverage this work and add a pipeline for your project inside the va-ati-tenant branch. See “7. References” section for link to QAOps SharePoint.
* Create your own! ATI based automation tests can integrate into most pipelines be they in Azure, AWS, AITC etc.

## Evaluation for Incoming Applications

* Evaluate candidate application for Test Automation feasibility.
  + Identify the application development technology / platform (e.g., Java Web, Delphi, .NET)
  + Evaluate candidate application design.
  + Review against existing automation Core platform support
* Application platforms we currently support.
  + Web, Windows, VistA applications, and API's
* Test Case / Script development.
  + Mentoring Phase 1 – Page class development approximately 4 weeks
  + Mentoring Phase 2 – Test Script development approximately 4 weeks
  + DevSecOps Tools Suite (DOTS) Team Hosting Environment
* CI / CD Pipeline
  + Jenkins
  + Jira/Xray

## Implementation Guidance

ATI provides guides for implementing ATI based automation tests. From workstation setup, project creation and structure, naming standards, coding standards, branching strategies, etc. Pulling all this together is our comprehensive guide for conducting peer reviews/Pull Request reviews.  From a QAOps perspective, the more the code adheres to the review guidelines, the more acceptable the ATI implementation.

All software must be approved in the TRM, and any updates are coordinated through the TRM team. All new software must be submitted to the TRM for approval to use on the production network. Any SaaS application pertaining to ATI must be approved through FedRAMP and a corresponding VA Authority to Operate (ATO).

## References

* GitHub Enterprise Design Pattern: [GitHub Technology Standard](https://view.officeapps.live.com/op/view.aspx?src=https%3A%2F%2Fdigital.va.gov%2Fwp-content%2Fuploads%2F2023%2F05%2FVA-GitHub-Technology-Standard.docx&wdOrigin=BROWSELINK)
* SharePoint Site for Demonstrations and ATI Manuals/Documentation:  
  [Quality Assurance Operations (QAOps) (sharepoint.com)](https://dvagov.sharepoint.com/:u:/r/sites/OITEPMOSoftwareTesting508/SitePages/Software-Testing-Automation.aspx?csf=1&web=1&e=WjrUNb)
* DOTS Service Portal: <https://github.com/department-of-veterans-affairs/dots-tools-jenkins>
* [Tech Tuesday 30 | Leveraging VA's Testing Automation Tool Interface (ATI) (December 5, 2023) (sharepoint.com)](https://dvagov.sharepoint.com/sites/oitdigitaltransformation/SitePages/TT30-QAOps.aspx)

## Document Version Control

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| **Date** | **Version** | **Change Details** | **By** |
| 11/16/23 | 0.1 | Original Draft | Mike Dance |
| 1/7/2024 | 0.7 | Updated draft including Tech Tuesday content | Yi Fang/Mike Dance |
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