**Automation Testing Requirements Document**

**1. Objective**

**To enhance and optimize current automation testing capabilities, focusing on execution efficiency, robustness, and integration of advanced AI-driven methodologies to enable faster, smarter, and accurate validation during active market hours and within development sprint cycles.**

**2. Scope of Work**

* **Automated UI and API validation of market data during active market hours (~9 PM IST).**
* **Advanced in-sprint UI automation scripting immediately post-deployment to development environments.**
* **Automation leveraging design assets (Figma) for predictive scripting and visual testing.**
* **Regression suite optimization based on impact analysis from code changes.**
* **Development and implementation of a new open-source AI-driven visual testing solution.**

**3. Technology Stack & Tools**

* **Automation Framework: Pytest, Selenium (or equivalent).**
* **Execution Platforms: Chrome, Mac Safari, iPhone, iPad.**
* **AI-driven Automation and Self-Healing tools for in-sprint automation.**
* **Custom AI-based visual testing tools.**
* **Data Management: Advanced solutions specifically tailored for Drupal-based test data creation, management, and synchronization across environments.**
* **CI/CD Integration: GitLab pipelines or equivalent.**

**4. Automation Framework Requirements**

* **Framework designed to reduce cross-device/browser testing from the current 2 hours to 15-20 minutes through parallelization and optimization.**
* **Robust and resilient framework capable of dynamically handling market data variability and frequent UI changes during execution.**
* **Framework supporting test script generation from Figma designs, facilitating early test automation.**

**5. Execution Environment**

* **Multi-threaded parallel execution environment across Chrome, Mac Safari, iPhone, and iPad.**
* **Execution capability optimized for real-time market data validation during active market hours (around 9 PM IST).**
* **Ability to schedule and execute tests nightly with robust validations unaffected by dynamic market data fluctuations.**

**6. Reporting & Documentation**

* **Comprehensive test execution reports generated in HTML and JSON formats.**
* **Real-time visibility into test execution status with dashboard views.**
* **Detailed logging for market data API-to-UI validation discrepancies.**

**7. Advanced Automation and AI Integration**

* **AI-driven agentic solutions for immediate scripting post-deployment to dev environments, ensuring in-sprint automation capability.**
* **Predictive test impact analysis tool to identify and execute only relevant test cases based on recent code changes.**

**8. Enhanced Visual Testing Requirements**

* **Development of a custom open-source visual testing tool leveraging AI.**
* **Validation of page skeleton without dependency on content.**
* **Intelligent handling and ignoring of vertical/horizontal content shifts caused by dynamic ad sizing.**
* **Smart validation of ad presence on pages, accommodating dynamic data.**

**9. Maintenance and Support**

* **Provision for regular script maintenance, updates, and support.**
* **Training sessions, documentation, and knowledge transfer on new automation tools and methodologies implemented.**

**10. Deliverables & Milestones**

* **Delivery of optimized automation scripts and framework enhancements.**
* **Implementation of advanced in-sprint automation tools and methodologies.**
* **Setup and delivery of robust AI-driven visual testing capabilities.**
* **Timely milestones to be mutually agreed upon initiation.**

**11. Acceptance Criteria**

* **Significant reduction in automation execution time (from ~2 hours to 15-20 minutes).**
* **Successful validation of market data via API-to-UI comparison during active market hours.**
* **Proven capability for immediate in-sprint test automation scripting.**
* **Reliable impact analysis demonstrated during regression testing based on code changes.**
* **Robust AI-driven visual testing validated through predefined scenarios and dynamic content handling.**

**12. Communication and Project Management**

* **Regular status updates via meetings and written reports.**
* **Utilization of collaborative tools (Jira, Confluence) for project tracking and documentation.**

**13. Security & Compliance Requirements**

* **Adherence to relevant security and compliance standards applicable to market data handling and testing environments.**