**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 and defect prediction.
* Enhanced visual testing capabilities.

**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.
* Visual Testing Tools: Integration with advanced visual testing frameworks (e.g., Applitools, Percy, or BackstopJS).
* Data Management: Tools or custom solutions for test data creation, versioning, 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 changes.
* Defect prediction mechanism integrated to proactively identify potential issues.

**8. Enhanced Visual Testing Requirements**

* 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 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 and defect prediction demonstrated during regression testing.
* Robust 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.