

Enhancing Digital Fundraising in Higher Education: A QA Automation Success Story

ORGANIZATION

Our client, a leading public university with a rich history of academic excellence and innovation, is recognized among the top universities in the United States. With a vibrant campus life and a strong research focus, the university attracts a diverse student community and fosters groundbreaking advancements.

To support its commitment to innovation and community engagement, the university developed a donor portal designed to simplify fundraising activities. This platform allows donors to search for funding opportunities and make secure donations that directly impact people and programs. Partnering with XTIVIA, the university aimed to ensure the reliability, functionality, and performance of this critical application while preparing it for future enhancements.

CHALLENGE

The university faced several challenges in ensuring the portal's reliability and performance across devices and systems, especially given the complexity of dependencies and frequent updates. Key challenges included:

- **Device Compatibility:** Ensuring compatibility with devices such as the iPad Pro and iPhone, each with varying screen resolutions, to deliver a seamless user experience without navigational or layout issues.
- **Data Synchronization:** Validating the complete end-to-end data flow across three interconnected systems to ensure consistency and accuracy of donor and payment information.
- **Dependency on Other Teams:** Testing required coordination with another department to set up specific data in the portal, causing scheduling delays and increasing testing complexity.
- **Local Storage Validation:** The application required validation of data stored in local storage, but Selenium WebDriver lacked built-in support for this, necessitating custom solutions.
- **Dynamic DOM Challenges:** Frequent UI updates in the React JS application resulted in locator obsolescence, requiring constant updates to ensure test scripts remained reliable.
- **Automation Environment Discrepancies:** Non-production environments often differed from production data, leading to failures in automated tests and requiring dynamic handling of environment-specific data.

TECHNICAL SOLUTION

XTIVIA collaborated with the client to design a comprehensive QA Framework tailored to their unique needs, addressing challenges across functional, API, and performance testing. Key aspects of the solution included:

1. Comprehensive Device Compatibility Testing

- **Responsive Design Testing:** Automated scripts developed using Selenium WebDriver validated UI elements across devices like the iPad Pro and iPhone, ensuring seamless accessibility.
- **Cross-Platform Functionality:** Tests ensured that varying screen resolutions and navigational structures maintained a consistent donor experience across all devices.

2. Data Synchronization Across Systems

- **Automated Validation:** Developed scripts using Postman to verify data accuracy and consistency across three interconnected systems, ensuring donor information and payment details were accurately synchronized.
- **Custom Data Flows:** Addressed cross-system communication challenges with workflow-specific validation rules. Data consistency between the MS SQL and the donor portal was validated in real time.

3. Enhanced Automation Framework

- **Local Storage Validation:** Integrated JavaScript Executor into Selenium WebDriver to directly retrieve and validate data stored locally by the application.
- **Centralized Locator Repository:** Maintained a repository to manage frequent UI updates, ensuring test reliability for dynamic DOM elements generated by React JS.
- **Dynamic Environment Handling:** External data files tailored for each environment (e.g., Non-Prod, Prod) allowed dynamic script execution and ensured consistent results during testing.
- **Vite for Efficient Front-End Development:** Used [Vite](#) to enhance the front-end build process, enabling rapid iterations and faster feedback cycles during development and testing phases.

4. Streamlined Collaboration and Test Management

- **Collaborative Processes:** Scheduled coordination meetings to streamline dependencies and align data setup with testing timelines, improving overall efficiency.
- **Comprehensive Test Management:** Leveraged JIRA for test case tracking, version control, and defect tagging, ensuring detailed and accurate documentation.

5. Regression and Performance Testing

- **Automated Regression Suites:** Validated critical workflows during each release cycle, ensuring stability across environments.
- **Performance Testing:** Using JMeter, the team evaluated the portal's ability to handle high traffic volumes and ensured stability in production, especially during peak fundraising periods.

BUSINESS RESULT

XTIVIA's rigorous QA Framework and automation strategy delivered measurable outcomes for the client, empowering their donor portal to function seamlessly and reliably. Key results included:

Seamless User Experiences: Enhanced device compatibility ensured donors could interact with the portal effortlessly across devices, including iPads and iPhones, ensuring accessibility for all users.

1. **Reliable Data Integration:** Automated workflows built with Postman synchronized donor and payment data across systems, guaranteeing accuracy and consistency.
2. **Improved Operational Efficiency:** External data files, a centralized locator repository, and Vite's optimized front-end builds reduced testing cycles, improved front-end reliability, and enhanced developer productivity.
3. **Scalability and Stability:** Performance testing using JMeter ensured the portal handled high donor traffic, especially during major fundraising events, without disruptions.
4. **Enhanced Collaboration and Management:** Tools like JIRA enabled streamlined communication, accurate tracking of test cases, and effective defect resolution processes.

Through XTIVIA's expertise, the university strengthened donor engagement, fostering trust and increasing participation in their fundraising initiatives. This robust approach established the portal as a reliable and scalable platform for future growth.

KEYWORDS

React JS, TypeScript, Liferay, Application Integration, Application Programming Interfaces (API), Postman, API Testing, QA Automation Testing, TCOE Services

SOFTWARE

Vite, Jenkins, Selenium WebDriver, Postman, Bitbucket, MS SQL, JMeter

ABOUT XTIVIA

At XTIVIA, we've provided IT solutions and consulting services for over 30 years. We offer a wide range of services, including technology assessments, IT service and asset management, software development, data analytics, cloud migration, DevSecOps, ERP, and enterprise content management. Our team of experts is dedicated to each discipline, ensuring that our clients receive the best possible service. We've partnered with industry leaders to bring our clients the latest solutions. Through strategic acquisitions, we've acquired talented people who are experts in their industries, passionate about what they do, and committed to providing exceptional service to our clients. Whether you need to improve your IT infrastructure or implement new software solutions, XTIVIA is here to help you achieve your business goals. Contact us today to learn more about our services. XTIVIA has offices in Colorado, New York, New Jersey, Texas, Virginia, and India. www.xtivia.com