



Introduction

Beginning in 2006, LeapFrog embarked upon an ambitious new market leadership strategy. Key components of that strategy called for aggressive new product introductions and the webenablement of all products.

Critical to the success of this strategic initiative was the need to improve operational efficiency. This required increased research and development productivity and throughput without increasing costs. These operational efficiency improvements necessitated fundamental changes to how LeapFrog approached software testing.

LogiGear helped LeapFrog change how they approached software testing to enable them to meet those demands. This case study will describe in detail how LogiGear helped LeapFrog introduce the highest volume of new platform and product introductions in the company's history while reducing testing costs and allowing the LeapFrog QA team to work more reasonable hours confident in the knowledge that their testing needs were being met.

LeapFrog Before LogiGear

From their founding in 1995 through 2003, LeapFrog employed a team of 30 to 40 full-time quality assurance (QA) engineers and 70 to 80 seasonal contractors to test the software of their platforms as well as their software titles. The vast majority (95%) of software testing was performed onshore. This testing proved to be both very costly and operationally

About LeapFrog

LeapFrog is a leading designer, developer and marketer of innovative, technology-based educational products and related content that provide the most engaging, effective learning experience - for all ages, in school, at home, and around the world.

About LogiGear Corporation

LogiGear Corporation (www.logigear.com) provides global solutions for software testing, and offers software testing training programs worldwide. LogiGear is a leader in the integration of test automation, offshore resources and US project management for fast, cost-effective results. Since 1994, LogiGear has worked with hundreds of companies from the Fortune 500 to early-stage startups, creating unique solutions to exactly meet their needs.

challenging due to the large number of seasonal contractors needing to be hired and facilitated each year.

LeapFrog's First Offshore Vendors

In the period 2003 through 2006 LeapFrog embarked upon an offshore outsourcing strategy in an attempt to address cost issues. LeapFrog simultaneously employed four different vendors in Asia, Canada, and South America for functional testing services.



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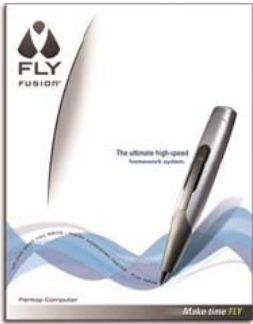
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Getting Started with LogiGear Offshore



A longstanding LogiGear customer, LeapFrog began evaluating LogiGear's offshore services in the fall of 2006. They did so in a manner similar to many of LogiGear's other customers – through a pilot project. Pilots are very helpful both as a means for LogiGear to prove itself to a

customer and as a proof of concept of the applicability of automated testing.

LeapFrog's pilot program with LogiGear consisted of onshore testing of new device platforms as well as some offshore testing of new content for LeapFrog's legacy platforms.

Ramping Up with LogiGear

LeapFrog's pilot with LogiGear proved to be very successful. LeapFrog was very pleased with the responsiveness of the LogiGear team. LogiGear's testing expertise helped to raise the overall effectiveness of LeapFrog's QA effort. Because of this, LeapFrog ramped up its use of LogiGear testing resources offshore in Vietnam and continued to heavily use onshore LogiGear resources through the Spring of 2007.

LogiGear as Sole Source for Functional Testing

In May of 2007, LeapFrog embarked on an initiative to outsource 80% of their software testing. In response to this initiative, LogiGear developed a growth, training, and execution plan to meet this goal. Based upon this plan and LogiGear's success to date, LeapFrog decided to outsource all of their functional software testing with LogiGear.

LeapFrog's Vice President of Quality Assurance cited the following reasons for

"LogiGear has been instrumental to the success of our aggressive growth strategy and will be a critical partner as we meet our ambitious product introduction goals going into the future."

**- Lyndall Fry
LeapFrog Vice President of
Quality Assurance**

the decision to partner solely with LogiGear:

- The high quality of work performed by LogiGear both onshore and offshore
- LogiGear's reputation
- LogiGear's proven test automation expertise
- LogiGear's responsiveness in all aspects of the relationship (account management, project management, test management, and training)
- LogiGear's embrace of open, frequent, two-way communication
- Flexibility and elasticity in staffing to meet seasonal needs
- Cost advantage
- The ease of managing a single vendor relationship

Results

Decreased QA Staff

- 30 to 40 full-time engineers down to 11 more highly skilled engineers

Eliminated Seasonal Hiring Challenges

- LogiGear test designers and automation engineers added as needed to meet demand

Decreased Hourly Testing Costs

- 30% less compared to prior outsourcing effort

Met Strategic Demands

- Highest volume of new platform and title introductions ever

The LogiGear Team for LeapFrog

The LogiGear team working with LeapFrog is made up of both US and Vietnam-based resources. The onshore team based in the Silicon Valley is comprised of account management, project management, and advanced test automation expertise. The Vietnam-based team consists of test management, test designers and automation engineers who create, automate, and execute a high volume of test cases.

The LogiGear teams in both the US and Vietnam communicate on a proactive

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and frequent basis with LeapFrog's testers, project leads and QA management. Communication methods employed include: phone, instant messaging, e-mail, a shared bug database, desktop sharing, and face-to-face meetings.

The LogiGear Testing Effort for LeapFrog

The LogiGear software testing effort for LeapFrog includes functional testing and advanced test automation, as well as team and process improvement. The types of software tested by LogiGear include desktop PC applications, individual LeapFrog product platform software, individual software titles for the product platforms, web integration, and download software as well as

"LeapFrog is a very gratifying success story for LogiGear. It shows what great things can be accomplished by employing an advanced automation methodology such as ABT, with the right supporting tools, and a global resourcing strategy that leverages our highly-skilled and low cost testing resources in Vietnam. We look forward to working with LeapFrog well into the future and helping them to meet their ambitious goals."

- Hung Q. Nguyen
Founder and CEO of LogiGear

Vietnam's Advantages

Cost Advantage

- 70% lower than US
- 30% lower than other outsourcing destinations

Talented Workforce

- Well educated
- 80% science / engineering grads
- Low churn (< 10%)

Intellectual Property Protection

- WTO membership
- TRIPs (Trade Related Aspects of Intellectual Property Rights) compliance

Growth, Stability and Safety

- 7.4% GDP growth
- \$5B in foreign direct investment (FDI) in 2006
- Safest country in APAC

database testing of LeapFrog internal business applications and websites.

Functional Testing

The LogiGear team formulates test plans, writes test cases, and executes test cases. Test case execution is both manual for the testing of software titles, as well as automated testing for core platform software. In addition, a defect database is maintained that

LogiGear uses to submit bug reports that both LogiGear (onshore and offshore) and LeapFrog can access.

Advanced Test Automation

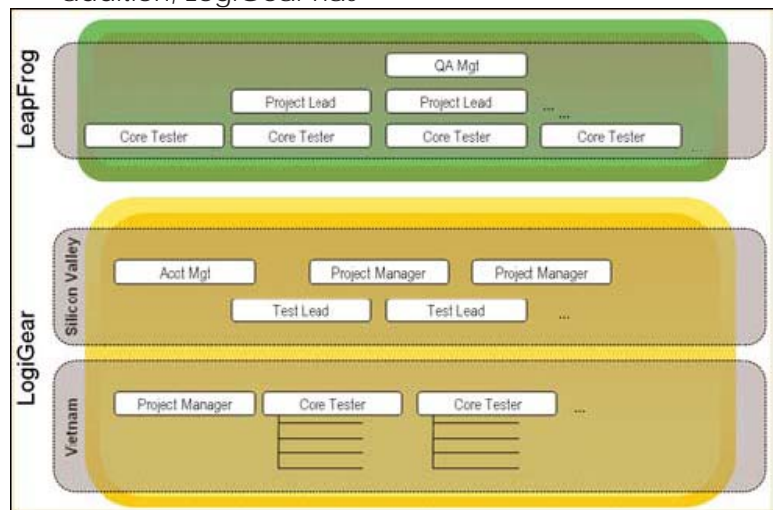
LogiGear also makes use of the Action Based Testing™ (ABT) methodology in testing for LeapFrog. ABT is a keyword-driven methodology pioneered by LogiGear that facilitates the creation and maintenance of automated test cases by every member of the team while reducing the effort needed to automate and

maintain test cases. LogiGear's implementation uses TestArchitect™, a tool set specifically designed to support the ABT methodology.

Automated testing is employed for testing of LeapFrog's core platform software, as well as for database testing, and testing of web-enabled products.

Team and Process Improvement

LogiGear also does QA training on testing methods, the ABT methodology, and the TestArchitect tool. In addition, LogiGear has



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worked on improving LeapFrog's resource/staff planning and keeping track of efforts expended on each product line. LogiGear is also defining the build acceptance tests for manual and automated implementations.

Types of Testing Employed

The LogiGear testing effort employs the full spectrum of testing methods including:

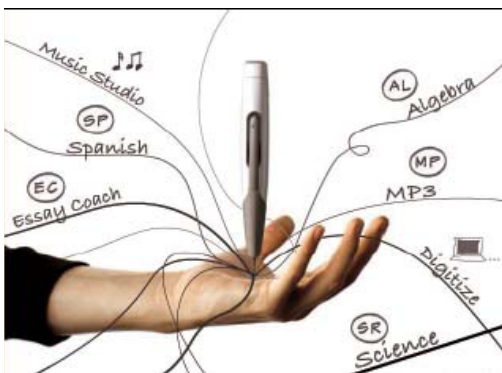
- Automated testing
- Database testing
- Manual testing
- Exploratory testing
- Black box testing
- Gray box testing
- White box testing

As of the end of 2007:

- LogiGear was being used by LeapFrog for 80% of their software testing needs.
- 10% of LeapFrog's software testing is still being performed by LeapFrog's internal testing team
- The remaining 10% is the linguistics and localization testing that is still being performed in Quebec

The Results

In nearly a year and a half, LogiGear tested 7 LeapFrog platforms and 69 individual software titles. This effort entailed the creation, automation, and execution of test cases.



There were over 75 discrete testing projects that in total averaged nearly 7,500 man hours of effort per month. Over time, LogiGear and LeapFrog expect efficiencies to improve even more due to LogiGear's familiarity with LeapFrog's products, and the ability to reuse a significant portion of existing tests for new revisions of software.

The results of the LogiGear software testing effort for LeapFrog have been dramatic. LeapFrog has seen:

- Average hourly testing costs reduced by 30%
- A decrease in in-house QA staff from 30 to 40 down to 11
- Higher skilled, more focused, and more stable internal QA staff
- Seasonal hiring challenges significantly reduced

Most important, LogiGear helped LeapFrog accomplish the highest volume of new platform and title introductions ever, including the introduction of two new platforms (the ClickStart™ learning laptop and the Fly Fusion™ pentop computer), and 12 new Leapster titles.

LeapFrog and LogiGear Going Forward

2008 promises to be another big year for LeapFrog and LogiGear:

- More and better new products
- Increased test efficiency
- Better, faster testing with more test automation

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