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**Case Study**  
**For**  
**Functional & System Testing of an Online**  
**Gaming Backend Application**

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Case Study for Functional & System Testing of an Online Gaming Backend Application	

**Table of Contents**

**1. THE CLIENT ..... 3**

**2. BUSINESS NEED ..... 3**

**3. THE CHALLENGES ..... 4**

**4. GATEWAY'S APPROACH AND SOLUTION..... 5**

**5. BENEFITS ..... 6**

**6. TOOLS AND TECHNOLOGIES ..... 7**

**7. DURATION AND RESOURCES ..... 7**

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Case Study for Functional & System Testing of an Online Gaming Backend Application	

## 1. The Client

Client is an Australia based gaming company involved in developing flash based internet games since many years. They have dominated most of the Australian market in internet based Slot Games and Board Games.

## 2. Business Need

At present, client is offering number of single player games which an individual can play online. However, the client was looking further to introduce the multiplayer games and tournament games. The vision was to develop a new product, which has portal to which games can be plugged in and the portal would manage different kind of Tournaments, Jackpots, Sweepstakes, etc. for number of Games.

To meet the client's requirement, a portal was developed having different engines to perform specific activities; it also introduced windows MSMQ services to communicate between different engines of the application.

Development of the portal provided with a new dimension to the client's business as more players got attracted towards game due to introduction of tournament games and with higher probability of winning prizes, jackpot and sweepstake based on the result of the tournament.

On the other hand, client was looking for an offshore testing partner who can scrutinize all the functionality of the application against the logic. As the application introduced real money games/tournaments client wanted to get the application thoroughly tested. Incorrect interpretation of players' money can result as loss of user's belief in the site which in turn results as loss in number of users.

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Case Study for Functional & System Testing of an Online Gaming Backend Application	

### 3. The Challenges

- Understanding application complexity and functional logic against the business logic.
- Research on number of different type of games and tournaments with different type of scenarios based on that.
- To support the development team of 18-20 members working rigorously to finish the application within given deadline.
- The portal being an application interacting to almost 12 different game engines viz., Tournament engine, Different Game engines etc.; we had to test each and every engine individually and then their integration testing was to be performed.
- To document tests cases to cover the core business functionalities.
- To test different Windows Services and Web Services.
- Testing the integrity of MSMQ with the web application.
- To test the validity of xml and swf files and how the application reacts with the invalid files.
- As the application is full of flash banner and pictures, it took much time to test those additional overheads on the application and its behavior with heavy load.
- To find out the key scenarios for the performance testing because the application was expected to be used by millions of users simultaneously in time duration of just one year of launch.

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Case Study for Functional & System Testing of an Online Gaming Backend Application	

#### 4. Gateway's Approach and Solution

Testing Game software needs unique testing strategy for the specific nature of the software. Game software is different as:

- The intention of software is different (Entertainment)
- Not designed for any specific industry
- Not defined for specific user group

The proposed and finalized testing actions that Gateway had to perform on the application included:

1. Unit Testing
2. Functional Testing (Module/Sub Module)
3. Usability and Compatibility Testing
4. Integrated and Incremental Testing
5. White box review by development team
6. Security and Performance Testing

Use of different type of web services and windows services made the application complex, thus, the understanding was not that easy. As the application functions as a web portal, there was no user interface for testing. All the major modules were developed as windows services and web services. All the major functionalities of the application occur in the background and results are displayed on the user panel. The key challenge was to write test scenarios, which would help in testing the background process. To get functional understanding in depth, our QA team coordinated with the onsite team through a variety of tools including GoToMeeting, dedicated phone lines and one to one meetings with the client representatives.

On the basis of knowledge transfer and reference documents provided by Client, Gateway Team prepared test cases covering all the functionalities and the entire possible scenarios of the tournament and different games. Team also prepared RT matrix to trace the test case coverage. An internal team reviewed the test cases, which were then sent to the client for review and approval.

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Case Study for Functional & System Testing of an Online Gaming Backend Application	

Test cases approved by the client were then executed on the application with different set of data. Defects were tracked using defect-tracking tools and detailed test metrics were provided at the end of each test cycle for evaluation purpose. The test cases were updated for the new scenarios, which were found during testing. Strict adherence to processes and meticulous documentation at every step ensured that organization does not leave any thing to chance.

In addition to functional tests, Gateway testing team also tested performance of the application using the automated testing tool WAPT 4.0. By executing performance tests before deployment, the team identified performance issues and determined how the application will perform in the operating environment at client end under the expected user load

## 5. Benefits

Gateway scored over other leading Indian IT companies as an offshore testing partner of choice. It stood out for its understanding of Clients Solutions' business locally, its technical soundness, cost-effectiveness and quality orientation. A proven offshore partner, Gateway also guaranteed a high level of service.

**Effective Resource Utilization:** The client's highly skilled development staff can focus on responding to client demands for new features while Gateway's specialized offshore testing team concentrates on verification and validation work.

**Faster Time-to-Market:** The Client now has the ability to accelerate product rollout due to a combination of freeing up internal staff for increased development and the ability to execute higher volumes of testing in shorter timeframes through Gateway's extensive offshore resources.

**Around the Clock Efforts:** Code developed during the day by the client's internal staff can be tested overnight by offshore staff and reviewed the next business day by the client Benchmarked performance of the application through load testing.

**Lower Costs:** By using offshore resources, the client has realized significant cost savings over an onsite model.

**Increased Customer Satisfaction:** Faster delivery of new features and higher overall software quality increases customer satisfaction and, ultimately, increases the client's revenue through increased customer retention.

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Case Study for Functional & System Testing of an Online Gaming Backend Application	

## 6. Tools and Technologies

- PLATFORM: Microsoft Windows
- TECHNOLOGY: .NET 2.0, SQL Server
- DATABASE: SQL Server 2005
- TOOLS: Mantis for Issue Tracking, WAPT 4.0 for Load Testing

## 7. Duration and Resources

- 6 months
- 3 QA Engineers and one Sr. QA Engineer in dedicated testing model