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# Case Study

## For

# Dedicated Game Testing Project

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## 1. The Client

The client is a Canada based online Dice and Cards games operator in USA and Canada. Their Games needed extensive testing to analyze Game rules, functionalities, Usability, the transaction of game points and money involved and competitiveness with other similar games in the market.

## 2. The Project

Client had made significant investment in developing the industries' best rated games. Client had to ensure that the games acquire the best of the usability to attract optimum number of gamers. As these games were involved with lots of payment and points based transaction, it was a prime challenge for client to ensure that at all time all the site users' remains happy and satisfied with clients' games.

The Game engines were required to be tested in accordance with the International Game Rules and Regulations. The walkthrough certification was to be given in line with I-Tech Labs. It also impacted the overall quality of testing along with associated costs and time.

Client was looking for an offshore test partner to:

- Understand the complete game rules and functionality in very short span to accelerate project
- Create the use cases for manual testing of the application and generate proper documentation for the same
- Test all the games for following:
  - International Game Rules
  - Random number generator
  - Game Engines
  - Functionality
  - Usability
  - Localization of Game website
  - Transactions Involved
  - On different platforms; Applet (MAC and IE), Desktop, Mobile.
- Execute and maintain test repository

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### 3. The Challenges

The main challenges Gateway faced were:

- Application complexity
- Non availability of formal functional documentation resulting in requirement of close collaboration with the client's development team for understanding, verification and execution of testing and bug resolving process.
- Communication and close track of all communication between the Client and their Development team.
- Ongoing changes in the application in terms of new features, enhancements and changes.
- Verification of application report details against the inputs and values in database

and other technology constraints related to application and game rules and logic based professional compatibility.

### 4. The Approach & Solution

Gateway was selected as an offshore test partner to perform manual testing of Dice and Card based games developed by other partners of our client. Gateway team had to ensure the overall quality of deliverables is achieved within the agreed timeline.

A proper communication channel was established between the client and its Development team to ensure that no gaps are left during the final testing. Weekly summary calls were made to ensure that Gateway team is in line with the development team and Client's expectations.

The Verification & Validation was done on basis of International Game rules and use-cases developed by Gateway QA team in line with the knowledge transfer from development team. Application access was given by client on Gateway's local test environment.

One of the major challenges in the execution was non-availability of formal functional documentation of the application. To overcome this limitation, we devised an iterative approach with the client. For each functionality group, Gateway followed the following approach iteratively.

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- Knowledge Transfer over Collaboration tools like GotoMeeting and voice communication for understanding of application flows
- Documentation of test cases for the modules under consideration
- Test Case Approval from the client
- Testing of games and daily reporting pattern for the Bugs and Issues found
- Verification and closure of each issue in line with the priorities defined
- Closure and acceptance

## 5. The Testing

### 5.1.Functionality

Overall functionality of the games was tested on following;

#### **5.1.1.Game Rules**

Even without formal documentation of the Game rules from the client Gateway team had to manage to test the complete game functionality in line with international game rule and regulation. Couple of fancy games has to be tested on Client given specification where Gateway has to confirm that these games would make the online gaming more interesting and interacting by putting up valuable addition and suggestion to the current application as well.

Gateway team accelerated with complete functional knowledge of each game just within the initial first week of the project to ensure that each module of the game and its functionality was tested in-depth.

Game rules were evaluated to confirm:

- Games operate as described in the game rules;
- Game rules adequately explain the operation of all game components including the features, free games, double ups, gamble, jackpot, extra cards or moves etc;
- There is sufficient information on how to play;
- Price determination is clearly explained;
- Payouts match the pay table
- Return to Player(RTP) exceeds 87%

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### 5.1.2. **Random Number Generator/ Card Dealer**

RNG and Card Dealer were tested to make sure that the algorithm for RNG and Card dealer are in accordance with the Game rules.

The Use of RNG and Card Dealer by games were evaluated to confirm:

- Correct scaling and mapping of the RNG output to produce game symbols, cards or other game outcomes;
- Game outcomes (symbols, cards etc.) are statistically independent, uniformly distributed and unpredictable.

### 5.1.3. **Winning hand calculation**

Along with the RNG each game's winning hand calculation and the winning pattern were tested against the Game rules and the RTP for the particular game. For this, a manual card dealer was programmed in JAVA to make sure that at all time the winning hand declared is according to the game rules. For dice games the moves allowed per dice rolled were checked by manual dice roll count feeder developed in JAVA.

Both of these exercises were done on the basis of the winning hand rules and the Dice rolled move rules of the games.

### 5.1.4. **Pay table and User Transaction/ Payouts**

Each game's pay out were tested against the Game rules and the winning hand calculation along with the Pay table of each game.

In line with the pay table and user pay outs, user account balance, ranking and points were also validated in the database and in the user game account.

## 5.2. **Usability & Playability**

### **Playability**

Playability is the most important factor for a successful game. Games should be challenging, but not frustrating so as to encourage viral marketing among gamers, low churn rates, and high usage. At Gateway our staff is comprised of die-hard gamers with vast experience across all type of games testing for industry leaders. Our testers supply the feedback necessary to ensure game playability is exciting, UI is intuitive, and input controls are optimized for ease of use.

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### 5.3.Compatibility

The games were tested against different platforms;

#### **Java Applet, Desktop Application**

All the above mentioned were tested on Windows and MAC compatibility.

#### **Mobile Application**

Mobile Based game software was tested for compatibility with following models using emulators;

**Nokia:** 3230, 6260, 6600, 6620, 6630, 6670, 6680, 7610, N 70, N91

**Blackberry:** 7200 & 7100

**Motorola:** A1000, A630, E1000, E550, E680, V3, V535, V550, V551, V620

**Sony:** 21010, 2800, d750, K600, K700, K750, P800, P910, S700, S710 W800

### 5.4.Security

#### **5.4.1.Account Security**

**Account Registration:** Prior to participating in any real money related activities, all users must register their full name and mailing address with Client Site. Cashouts were processed first by refund back to the credit card used to make the deposits and cheques are sent to the name and address provided with the registration information, thereby eliminating the motivation to create false accounts.

- Internal to the software, each account is tracked by a unique account number that is generated automatically at the time the account is registered. For added security, players do not have access to this account number and the account number will remain transparent to the player. The player nickname will be used in all external references to the player account. The player nickname and account number cannot be changed. User account can only be accessed using nickname and chosen password.
- For increased security, user password should be 8 - 10 characters, with a combination of upper & lower case letters, numbers and shift number keys.

#### **5.4.2.System Security**

- The game security was tested very thoroughly. Whenever user accesses Client website or online game any confidential information passed between server and client is encrypted. Client website uses secure server technology

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to ensure that when user performs a cashout, access Game histories, make deposits etc., communications are protected using the same technology as online banking sites. All communications between the game on user's computer and game servers are also encrypted using public/private key encryption. Keys are changed frequently and are different for each client program

### **5.5.Performance**

Game performance was tested by developing Robots in JAVA. Using Robots game server was loaded with 5000 simultaneous gamers to play the same game for one hour. Server switching and server response time were tested to be within the minimum allowed range.

RNG was tested with the same robots to supply the results and card distribution within the minimum allowed time.

Game performance was also tested against various Internet bandwidth and connection to make sure that gamers are not frustrated even at the lowest internet bandwidth and connection delay.

Gateway also suggested and Client implemented a color code for various types of Internet connection and Bandwidth delay.

## **6. Tools and Technologies**

**Development & Testing Technologies :** J2me, Java Socket Programming, Java Swing, JDBC, Php, MySQL, Smarti

**Server Client Platforms :** Linux, Windows, Mac

**Bug Tracking :** Mantis BT

## **7. Benefits**

- Games usability was improved by 40 % which rated the game ahead with the competitors' games
- Games performance was improved by 30%

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- Increased efficiency of testing by least knowledge transfer time taken from the Client as our game domain expertise helped us a lot in testing and improving the quality of the games.
- Walkthrough against well-known testing lab in Australia gave a high level confidence to our client in making the games live.
- Close communication with client & development team from Gateway made the dead line achievable.