

# Developer-led High Impact Game and Platform Experiments

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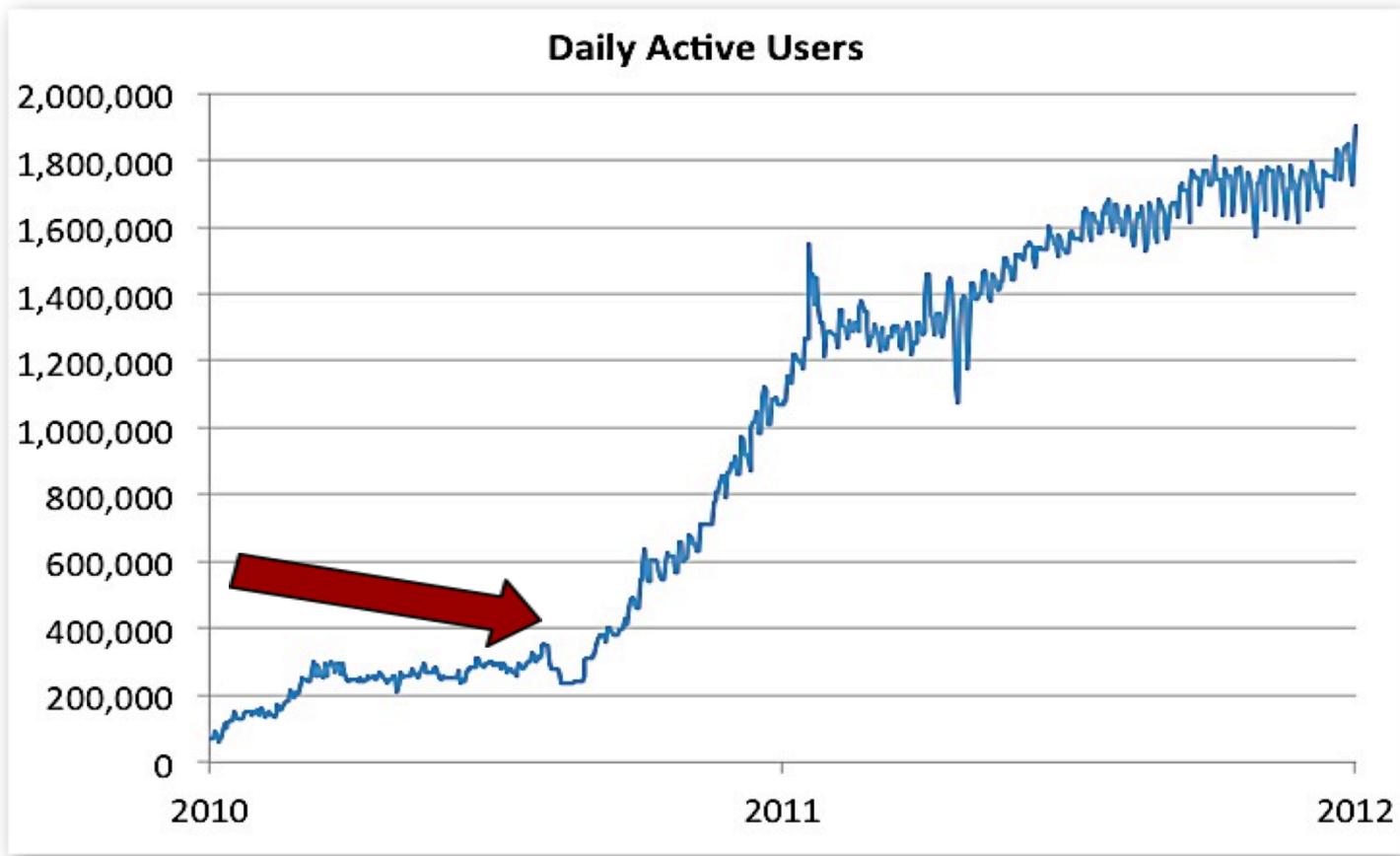


# A Story



# Daily Active Users





# Company Info

- 23 employees
- Top 10 developer / top 20 game
- Touched 50+ million users
- Launched 22 games last year



# Agenda

- Experiments:
  - Game
  - Platform
  - Performance
- Tools
- Closing

# Game Experiments



# Game Experiments

- Process:
  - Not what "conventional" studios do
  - Engineers conceive + design ideas
  - Game designers suggest adjustments and approve ideas

# The Game - Bingo Beach



# The Game - Bingo Beach



# Choosing Experiments

## Fun Ideas



VS.

## Monetization

But if you want to buy things, you'll need a shop to buy them from. Would you like to buy a shop menu screen for \$400?

Yes

NO

Please upgrade your decision making power to enable this option.

# Research



# Gaming Experience Can Be Applied Across Genres

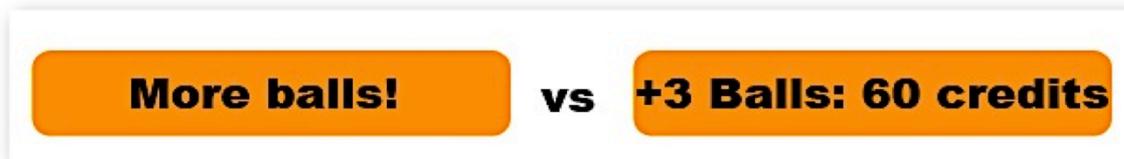


# Deciding on an MVP

Better UI Graphics:



Better Instructions:



Improve After a Successful Test:

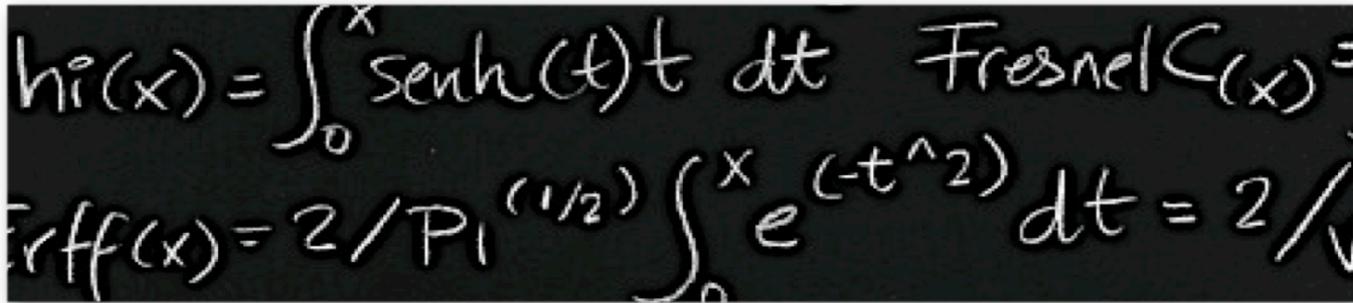


# How We Prioritize

- Engineering time vs. potential impact
- Consider other key metrics: virality, # of payers, engagement
- Odds of success vs. chance to learn

# How We Estimate

- Always estimate the outcome of every test
- Compare the results with your estimate; it's the only way to get better at estimating
- The better you are at estimating, the better you are at determining which tests to run



Handwritten mathematical formulas on a chalkboard:

$$\operatorname{Ei}(x) = \int_0^x \operatorname{sech}(t) t \, dt \quad \operatorname{FresnelC}(x) =$$
$$\operatorname{Erfi}(x) = 2/\sqrt{\pi} \int_0^x e^{-t^2} \, dt = 2/\sqrt{\pi}$$

# Extra Balls

- Background:
  - Our bingo games are single player and non-competitive, so rather than drawing balls until there is a bingo, we give them a limited number of balls
- Hypothesis:
  - Providing 3 extra balls at the beginning of the game gives a higher chance of having a winning game
  - Providing 3 extra balls at the end of the game will tempt people who feel they are close to a bingo





# Extra Balls

- Time to Implement:
  - 2 days
  - This is a great feature because it essentially changes one parameter of the core game mechanic



# Extra Balls

- Results: both successful but end of game was better
  - At start: 11.61% more payers, 21.23% payments, 4.99% more revenue
  - At end: 43.64% more payers, 67.23% more payments, 13.93% more revenue



# Extra Balls

- Learnings:
  - "Heat of the moment" features more successful

# U-Pick'em

- Background:
  - This is a popular feature in the real world but not so much in online bingo games
  - Entirely cosmetic, no real effect on game play
- Hypothesis:
  - Players often have superstitious numbers and patterns and might like to choose their numbers



# U-Pick'em

- Time to Implement:
  - 4 days
  - Fairly extensive modifications to UI to allow for this



# U-Pick'em

- Results:
  - -1.46% more payers, -3.56% payments, 11.04% more revenue



# U-Pick'em

- Learnings:
  - Purely cosmetic features can be successful but are costly to implement

# Extra Patterns

- Background:
  - A number of winning patterns exist in bingo other than the typical "5 in a row"
- Hypothesis:
  - People will pay for extra win patterns
  - Leverage our exponential price curve for single/double/triple bingos to entice players to pay for more bingos per card





# Extra Patterns

- Time to Implement:
  - 1 day
  - Fairly minor, only changing the win pattern detection in game engine



# Extra Patterns

- Results:
  - 11.82% more payers, 50.40% more payments, 30.06% more revenue

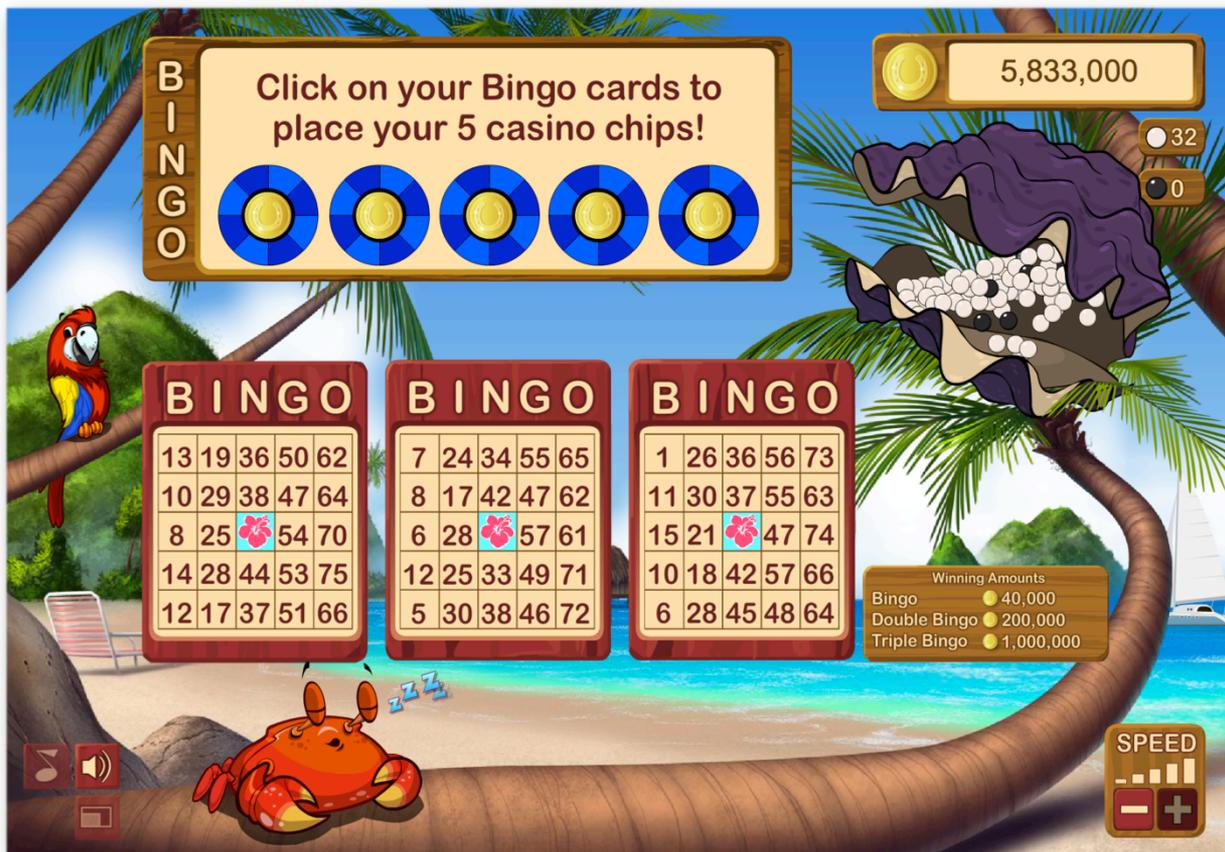


# Extra Patterns

- Learnings:
  - Successful, even though purchased at beginning of game rather than in the “heat of the moment” with extra balls

# Casino Chips

- Background:
  - The player could have casino chips to place on their bingo cards to allow for instant wins when spaces are marked
- Hypothesis:
  - Players will enjoy having additional ways to win prizes



# Casino Chips

- Time to Implement:
  - 3 days
  - Modifications to the UI allow placement of chips plus changes to the engine to detect matches
- Results:
  - 4.21% more payers, 9.85% more payments, 2.53% more revenue (low statistical significance)

# Casino Chips

- Learnings:
  - Side bets can make for effective features but doesn't do as much as a feature tied to the core game mechanic

# Game Experiments Conclusion

- 3 successful, 1 failed
- 11 days of engineering
- 65% more revenue



# Platform Experiments

- Viral
- Payment

# Viral Experiments

How do I double my install rate?



[Invite Friends](#) [Badges](#) [Help/FAQs](#)



Hi, Nick!  
Level: 26 (674/1440)  
[View Profile](#) | [History](#)

- Action
- Card
- Casino
- Hidden Object
- Puzzle
- Strategy
- Word
- Tournaments

923,114

Get 15% bonus Tokens on larger Token purchases!

[Get More Tokens »](#)

# You won 7,000!

close x

Come back tomorrow to keep your streak alive!



5+ Day Bonus



4 Day Bonus



3 Day Bonus



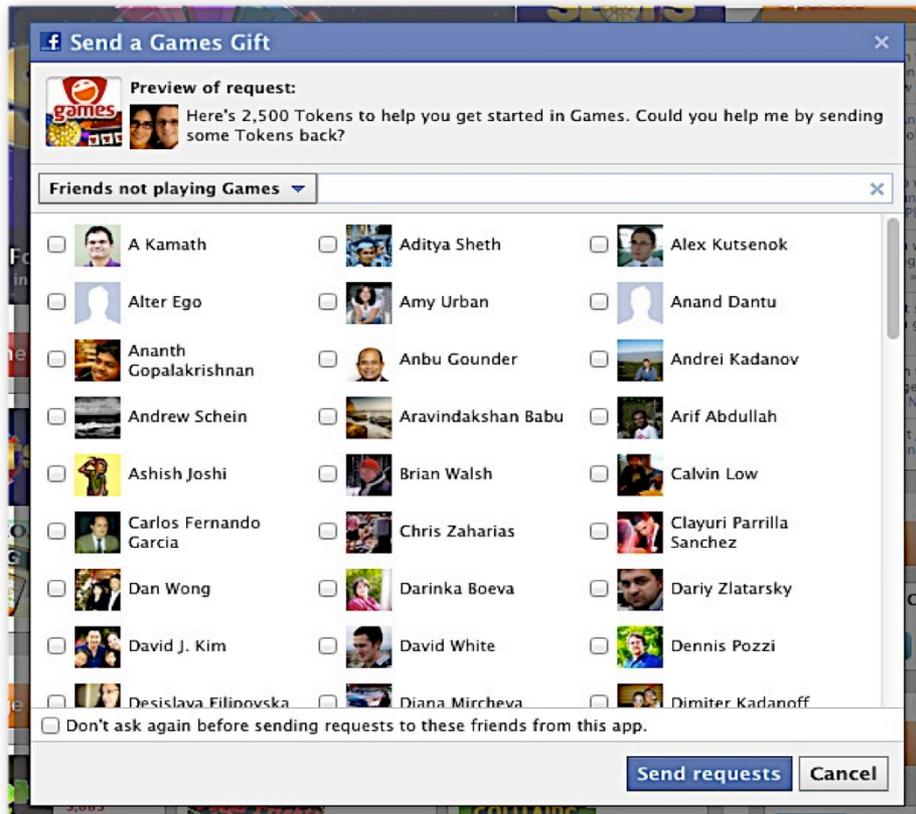
2 Day Bonus



Today

Additional All-Reel Spin 10

# Facebook's Widget



# Games App Widget

The screenshot displays the 'games' app interface. At the top, there's a navigation bar with categories: Action, Card, Casino, Hidden Object, Puzzle, Strategy, Word, and Tournaments. A user profile for 'Nick' is visible in the top right, showing level 26 and 150 tokens. A promotional banner offers 50% more tokens. The main area features a large red notification: 'You won 7,000! Come back tomorrow to unlock more spins.' Below this, five reels are shown with values: 1000 (4 Day Bonus), 2500 (3 Day Bonus), 2500 (2 Day Bonus), 1000 (Today), and a mystery reel (Come Back Tomorrow). An 'Additional All-Reel Spin' button costs 10 tokens. The bottom section is titled 'Send a Mystery Gift' and shows a list of friends not playing Games, with a 'Send' button at the bottom right.

# Facebook Widget Replacement

- Time to Implement:
  - 10 days
- Results:
  - Re-engagement up 13%, DAU up 3%, virality up 4%
- Learnings:
  - Ease of use of invite widget = more invites, better engagement

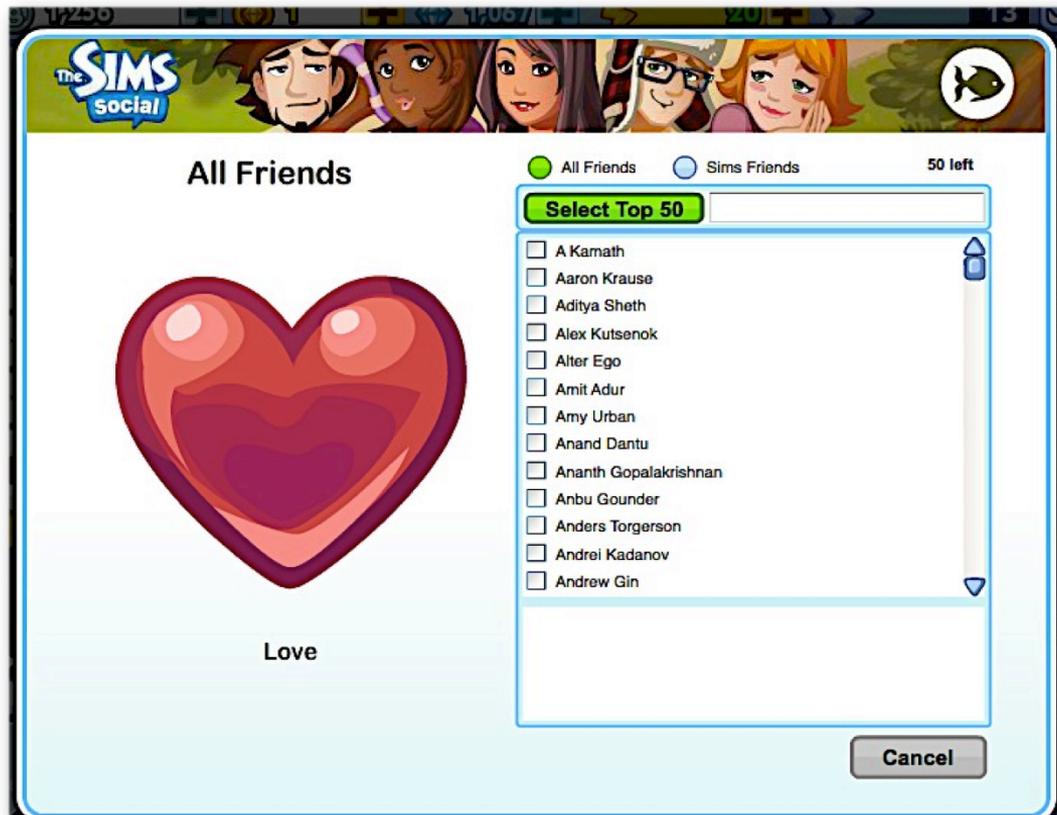
# Evolution



# Tetris Battle Implementation



# The Sims Implementation



# CastleVille Implementation



# Smart Invite Widget

## Send a Games Gift



**Preview of request:**  
Here's 2,500 Tokens to help you get started in Games. Could you help me by sending some Tokens back?

**Send**

- All Friends
- Recommended Friends
- Friends not playing Games
- Friends playing Games

Select all friends

Recommended Friends

<input checked="" type="checkbox"/>  A Kamath	<input checked="" type="checkbox"/>  Aaron Krause	<input checked="" type="checkbox"/>  Aditya Sheth	<input checked="" type="checkbox"/>  Alex Kutsenok
<input checked="" type="checkbox"/>  Alter Ego	<input checked="" type="checkbox"/>  Amit Adur	<input checked="" type="checkbox"/>  Amy Urban	<input checked="" type="checkbox"/>  Anand Dantu
<input checked="" type="checkbox"/>  Ananth Gopalakrishnan	<input checked="" type="checkbox"/>  Anbu Gounder	<input checked="" type="checkbox"/>  Andrei Kadanov	<input checked="" type="checkbox"/>  Andrew Gin
<input checked="" type="checkbox"/>  Andrew Schein	<input checked="" type="checkbox"/>  Aravindakshan Babu	<input checked="" type="checkbox"/>  Archi Rajwat	<input checked="" type="checkbox"/>  Arif Abdullah
<input checked="" type="checkbox"/>  Ashish Joshi	<input checked="" type="checkbox"/>  Brian Mahoney	<input checked="" type="checkbox"/>  Brian Walsh	<input checked="" type="checkbox"/>  Calvin Low

**Send**

# Smart Invite Widget

- Time to Implement:
  - 2 days
- Results:
  - 58% more invites sent
  - **415%** more invites sent to non-app users.
  - **123%** more viral users created
  - 2-4% boost in engagement, or 100K users
- Learnings:
  - Smart invite targeting works
  - Continue testing the recommended group

# Payment Experiments



# First-Time Purchase



# First-Time Purchase

## Purchase Tokens

### Purchase Tokens

- ✓ 1 Credit = 1,500 + 1,500 bonus Tokens today - Special Offer!
- 20 Credits = 15,000 + 15,000 bonus Tokens today
- 50 Credits = 37,500 + 37,500 bonus Tokens today
- 100 Credits = 75,000 + 75,000 bonus Tokens today
- 250 Credits = 187,500 + 232,500 bonus Tokens today - Good Value!
- 500 Credits = 375,000 + 475,000 bonus Tokens today - Great Value!!
- 1,000 Credits = 750,000 + 1,020,000 bonus Tokens today - Better Value!!!
- 2,000 Credits = 1,500,000 + 2,250,000 bonus Tokens today - Best Value!!!!

# First-Time Purchase

- Time to Implement:
  - 10 minutes
- Results:
  - 25% more payers
  - 6.7% more revenue



# Token "Buy Back"

The screenshot shows a game interface with a blue background and a red navigation bar at the top. The navigation bar includes categories: Action, Card, Casino, Hidden Object, Puzzle, Strategy, Word, Tournaments, and Tokens in Game (with a gold coin icon). Below the navigation bar, a red banner reads "Get 50% more Tokens with each purchase! 13 hours left" and a blue button says "Convert 250 Credits to 315,000 Tokens".

The main content area features a large "Thank You for Playing!" message. Below it is a white box with a red star icon, "Player Points This Session: 1", and "Level 61 — (1/10)".

On the left, a white box contains the text "Get back in the game! And get a 50% Buy Back Bonus!" and a blue button that says "Get ~~15,000~~ 22,500 [gold coin icon] for 20 [gold coin icon]". Below this is a link for "Other Purchasing Options".

On the right, a white box titled "Other games you may like:" displays two game thumbnails: "Wheel of Fortune Slots" and "Fishdom Social", each with a "Play »" button.

At the bottom, navigation links are provided: "« Back to Undersea Treasure Slots | Continue to Home Page »".

# Token "Buy Back"

The screenshot shows a game interface with a blue background and a red navigation bar at the top. The navigation bar includes categories: Action, Card, Casino, Hidden Object, Puzzle, Strategy, Word, and Tournaments. The 'Tokens in Game' category is selected, indicated by a gold coin icon.

Below the navigation bar, a red banner displays the text: "Get 50% more Tokens with each purchase! 13 hours left" and "Convert 250 Credits to 315,000 Tokens".

The main content area features a large white text box that says "Thank You for Playing!". Below this, a white box displays "Player Points This Session: 1" with a star icon and "Level 61 — (1/10)".

A red-bordered box highlights a promotional offer: "Get back in the game! And get a 50% Buy Back Bonus!". Below this, a blue button shows "Get ~~15,000~~ 22,500 Tokens for 20 Credits". Underneath the button is the text "Other Purchasing Options".

To the right of the offer box, a section titled "Other games you may like:" displays two game thumbnails: "Wheel of Fortune Slots" and "Fishdom Social". Each thumbnail has a "Play »" button below it.

At the bottom of the interface, there are two navigation links: "« Back to Undersea Treasure Slots" and "Continue to Home Page »".

# Token "Buy Back"

- Time to Implement:
  - 2 days
- Results:
  - Revenue +21%
  - Payers +40%
  - Session time +5%
- Learnings:
  - Time and place of payment options can make a huge difference

# Performance Experiments

(this is where it gets geeky...)



# Javascript Minification

- Background:
  - Engineering wants to write more verbose Javascript
- Hypothesis:
  - Results in engineers writing better code
  - Minifying makes pages load faster



# Javascript Minification

- Time to Implement:
  - No changes to developer workflow
  - 3 days
- Results:
  - Gameplay +5% (+1M more game plays/day)

# Page Load Optimization

- Background:
  - High bounce rates and customer support
  - Performance Monitor (aka "PerfMon") says:
    - Home Page ~ 400ms
    - Game Page ~ 300ms

[Clear Stats](#)[Deactivate](#)[Refresh](#)By Hour: [all](#) [0](#) (53) [1](#) (51) [2](#) (50) [3](#) (52) [4](#) (55) [5](#) (57) [6](#) (56) [7](#) (57) [8](#) (58) [9](#) (59) [10](#) (60) [11](#) (60) [12](#) (279) [13](#) (64) [14](#) (62)

function	calls	time	average time	total db calls
_all	8,713,731	607,693,741	69.74	0
<a href="#">[-]</a> /facebook/flashAdjustTokens	3,133,443	116,779,399	37.27	4.01
_all	94,544,196	96,263,682	1.02	
<a href="#">[+]</a> com.videocritic.dao.I_UserDAO.readUserByFacebookUserIdWithAppPropertie	3,133,408	27,518,306	8.78	
<a href="#">[+]</a> com.videocritic.dao.rpg.I_GameDAO.loadOrCreatePerson	3,133,408	22,043,981	7.04	
<a href="#">[+]</a> com.videocritic.email.I_EmailDAO.getEmailPromotion	3,133,408	15,439,375	4.93	
<a href="#">[+]</a> com.videocritic.userjson.I_UserJsonDAO.getCompressedUserJson	3,133,408	14,604,708	4.66	
<a href="#">[+]</a> Cached Hibernate	69,483,391	13,071,268	0.19	
uncompress	6,212,086	2,268,012	0.37	
firstParamRead	3,133,443	585,697	0.19	
cacheGet	3,133,408	530,631	0.17	
<a href="#">[+]</a> com.videocritic.experience.I_ExperienceDAO.readExperiencePointsLevel	14,914	95,428	6.4	
<a href="#">[+]</a> com.videocritic.dao.rpg.I_GameDAO.readFlashGame	13,362	45,438	3.4	
<a href="#">[+]</a> com.videocritic.dao.rpg.I_GameDAO.readCurrentPromotion	4,898	23,536	4.81	
<a href="#">[+]</a> com.videocritic.dao.I_UserDAO.readFacebookApplication	3,804	18,062	4.75	
<a href="#">[+]</a> com.videocritic.dao.rpg.I_GameDAO.readAllPaymentTestTypes	633	7,575	11.97	
<a href="#">[+]</a> com.videocritic.dao.I_AdTargetingDAO.readActiveAdSlots	965	5,895	6.11	
<a href="#">[+]</a> com.videocritic.dao.rpg.I_GameDAO.readFeatureGates	451	2,847	6.31	
<a href="#">[+]</a> com.videocritic.dao.I_UserDAO.readFacebookApplicationByApiKey	257	1,791	6.97	
cachePut	8,950	1,132	0.13	
JSP render	2	0	0	
<a href="#">[+]</a> /facebook/rpgFacebookCredits	252,269	94,466,831	374.47	5.02

# PerfMon

- Always on
- Real-time view of every API call in the system
- Drill-down the entire call hierarchy from request to DB
- Lots of goodies:
  - Average response time by page/API
  - DB calls/req, FB calls/req
  - Daily or hourly metrics

# Page Load Optimization

- Hypothesis



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# Page Load Optimization

- Determining MVP:
  - How is our utilization?
  - Is there low hanging fruit?
  - What are our pain points?



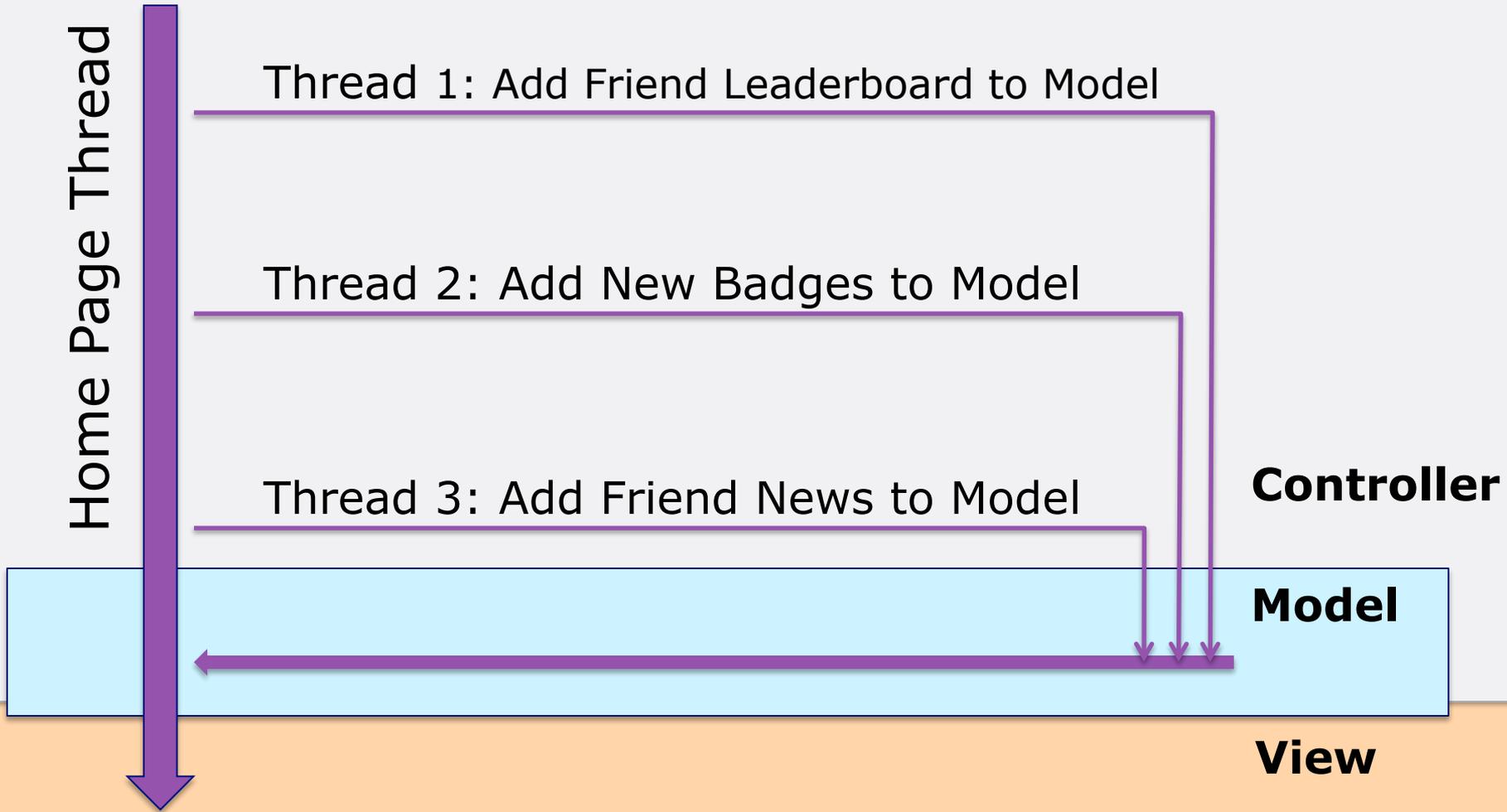
# Page Load Optimization

- MVP Options:
  - Move to more AJAX
  - Optimize existing server-side controllers



# Page Load Optimization

- Implementation:
  - When handling a request spawns multiple helper threads
  - Wait for helper threads to complete before handing off to UI
  - Built a custom framework around Java Future Tasks



# Page Load Optimization

- Time to Implement:
  - 3 days
  - Took 2 most important pages
    - Home page
    - Game page

# Page Load Optimization

2X improvement with  
3 days of work!

# Page Load Optimization

- Results:
  - Home: 423ms to 210ms
  - Game: 285ms to 143ms
  - Revenue +10%
  - Bounce rate -5%
- Learnings and Next Steps:
  - Performance absolutely affects customer behavior
  - Now that backend is fast move to AJAX and make things even faster

# Tools



# Release Management

- Transparency
- Frequency
- Simplicity



# Release Management



**Debarshi Kar**

5:56 PM

my stuff is looking good.. any issues?



**David Tudury**

5:56 PM

all good



**Debarshi Kar**

5:58 PM

push\_build latest app2 app40



**MesmoBot**

5:58 PM

\*\*\* Push request needs confirmation [t120227\_173818-mainline] [app2 to app40],  
TYPE 'push\_confirm 364'



**Debarshi Kar**

5:58 PM

push\_confirm 364

# Game Upload Tool



## Upload a zip file

If your game is made up of multiple resources use this form to upload a zip file.

Game:

ZIP file:  No file chosen

Name of primary SWF  
in ZIP:

Name of message file  
in ZIP (optional):

# Exception Monitor

[Clear](#)

[Deactivate](#)

[Refresh](#)

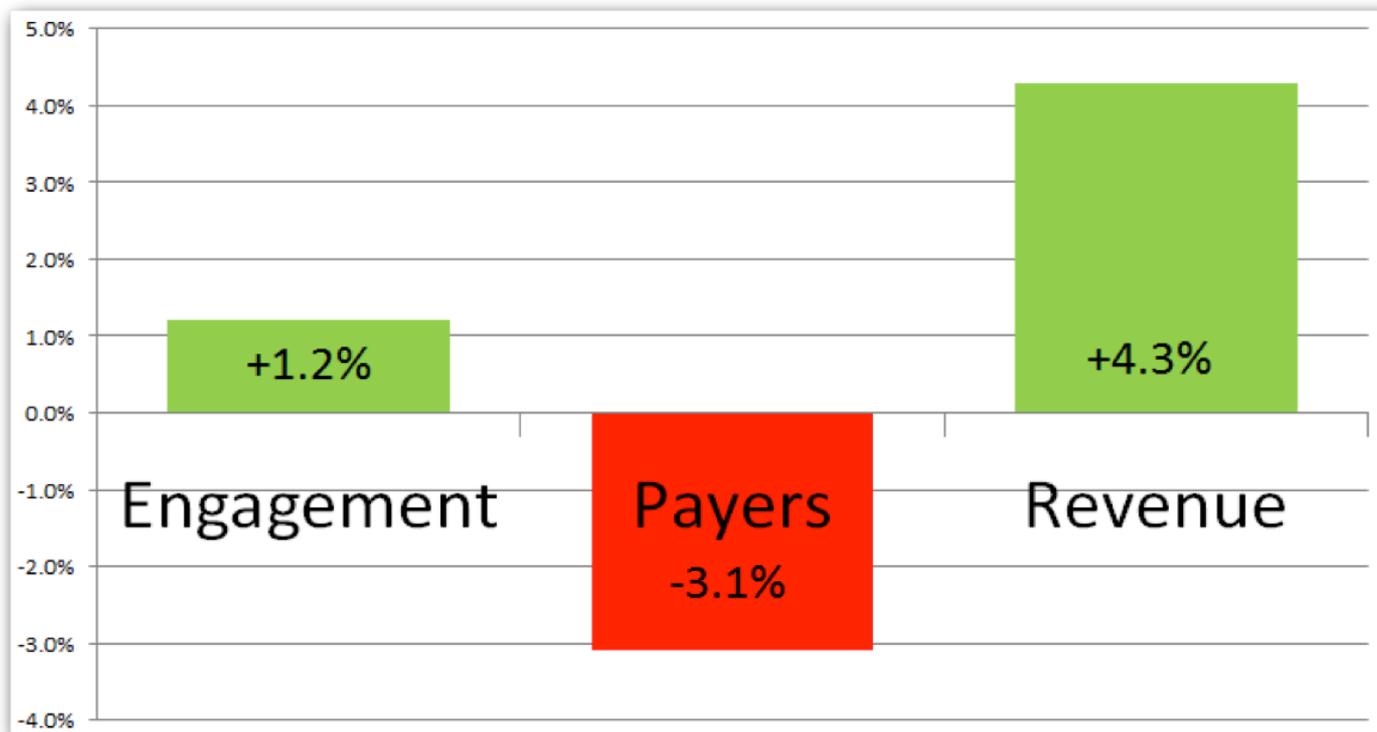
name	error count	count
[+] flash-error-queue	142498	142498
[-] open-graph-queue		
name	count	
[+] com.videocritic.facebook.api.FacebookException	7526	7542
[+] org.json.JSONException	10	
[+] java.net.SocketException	6	
[+] facebook-api-job-queue	6700	306337
[+] /facebook/rpgFacebookCredits	365	265409
[+] /facebook/rpgArcadeTokenGift	261	54231

# Data Warehouse

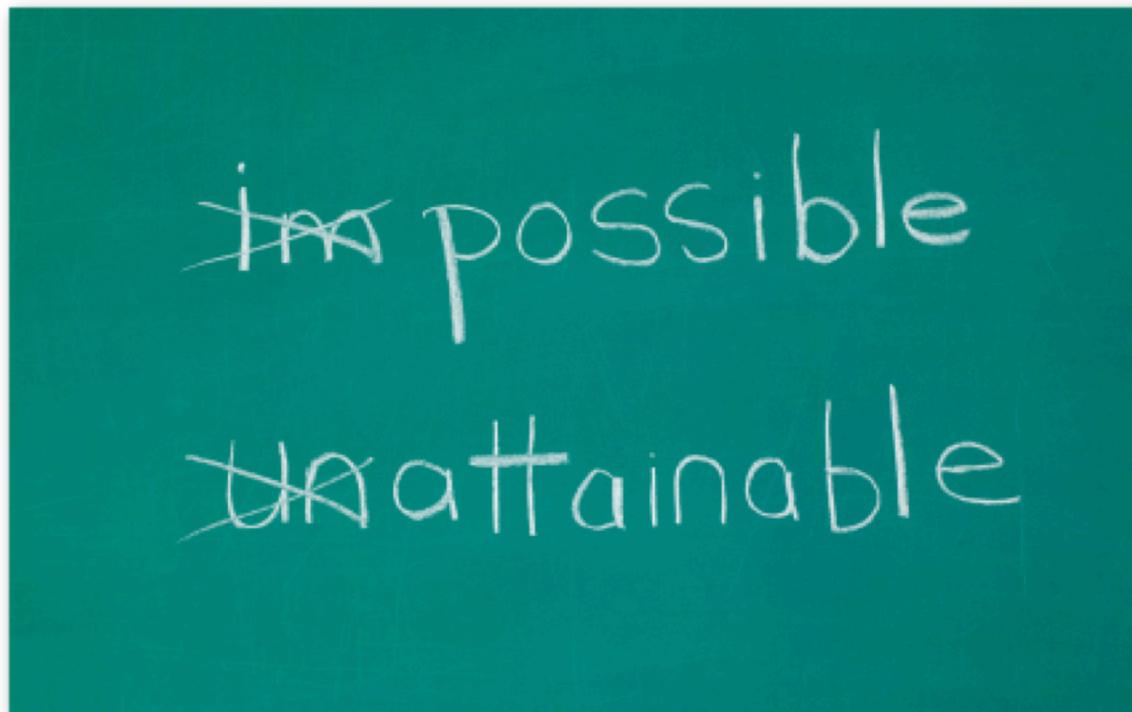
- Using Vertica for DW:
  - Forget "old school" data-warehousing
  - Write plain SQL, query BILLIONS of rows in ms



# Cohort Report



# Closing



# Empower Engineers

- Conceive
- Design
- Build
- Launch
- Analyze



# Create an A/B Test Culture

- Everyone can contribute ideas/be heard
- Failures are treated as learning opportunities
- Creativity and metrics BOTH matter



# Achieve

- Developer-led high impact results
- Fast iteration cycles
- Great tools



# We're Hiring

- Game Developers
- Platform Developers
- Game Producers and more...

[GSNgames.com](http://GSNgames.com)