

Developer-led High Impact Game and Platform Experiments

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GAME DEVELOPERS CONFERENCE

SAN FRANCISCO, CA
MARCH 5-9, 2012
EXPO DATES: MARCH 7-9

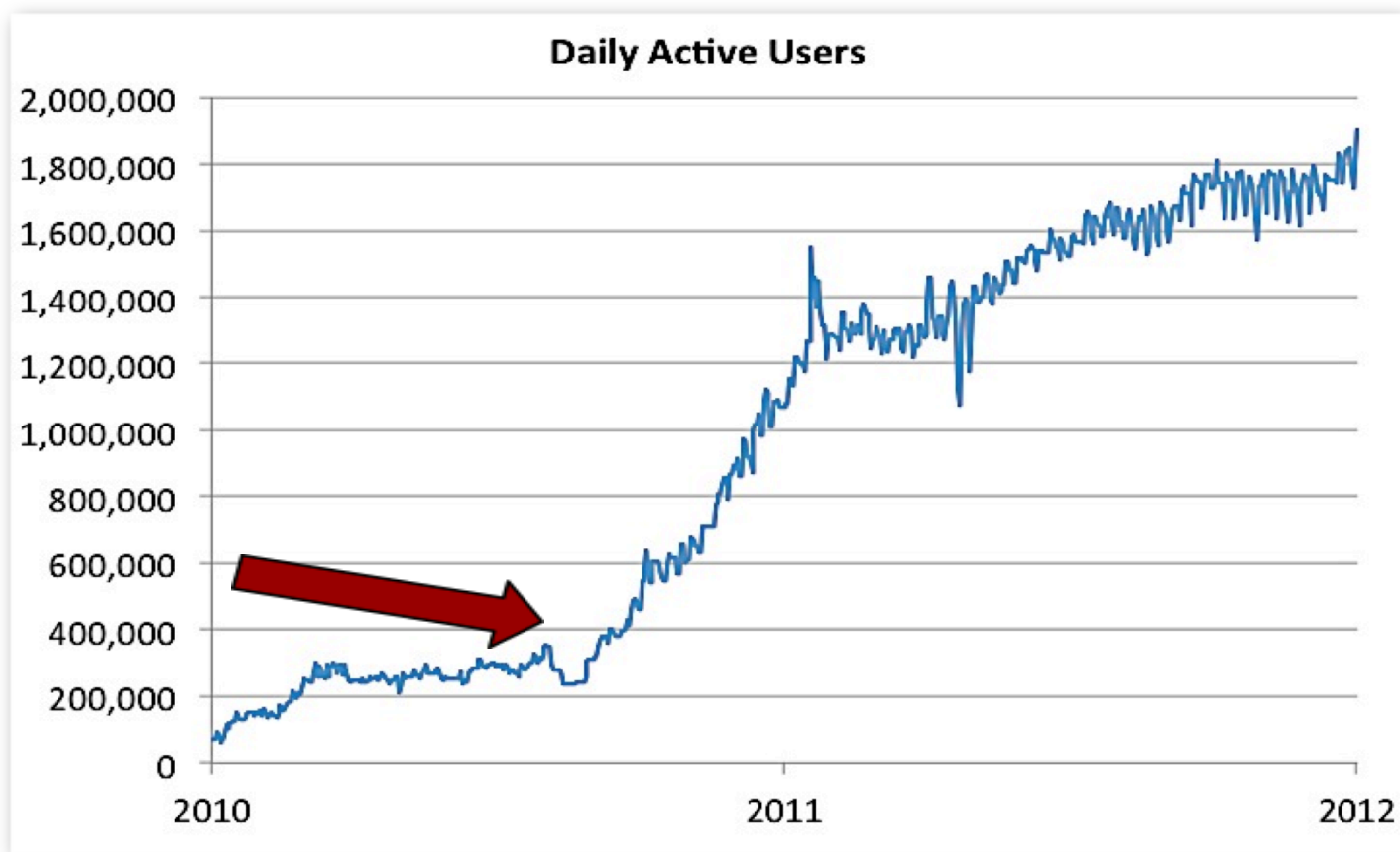
2012

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:

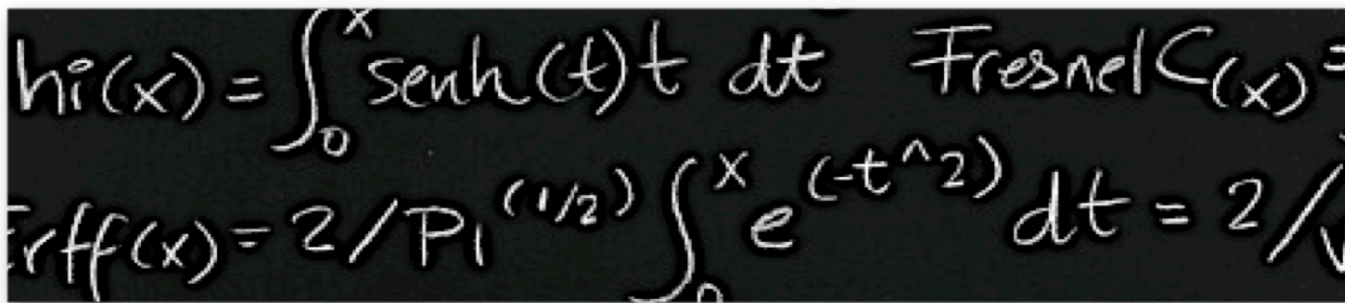


How We Prioritize

- 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:

$$\operatorname{Erfi}(x) = \int_0^x \sinh(t) t \, dt \quad \operatorname{FresnelC}(x) =$$
$$\operatorname{Erf}(x) = \frac{2}{\sqrt{\pi}} \int_0^x e^{-t^2} \, dt = \frac{2}{\sqrt{\pi}}$$

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 More Tokens »](#)

Get 15% bonus Tokens on larger Token purchases!

You won 7,000!

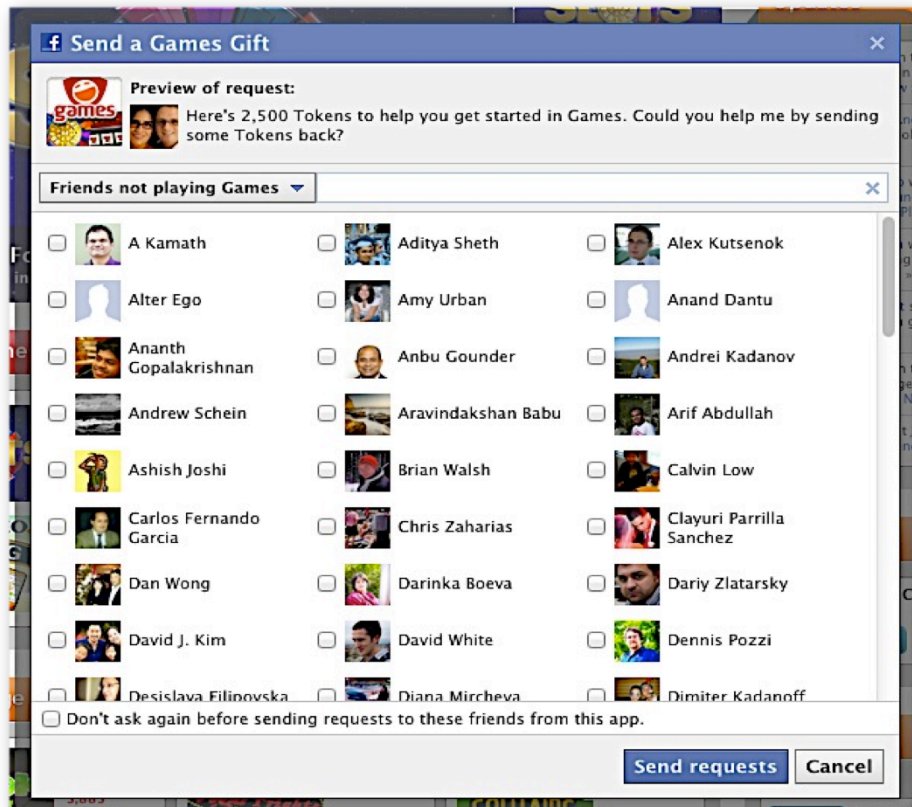
[close](#) 

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

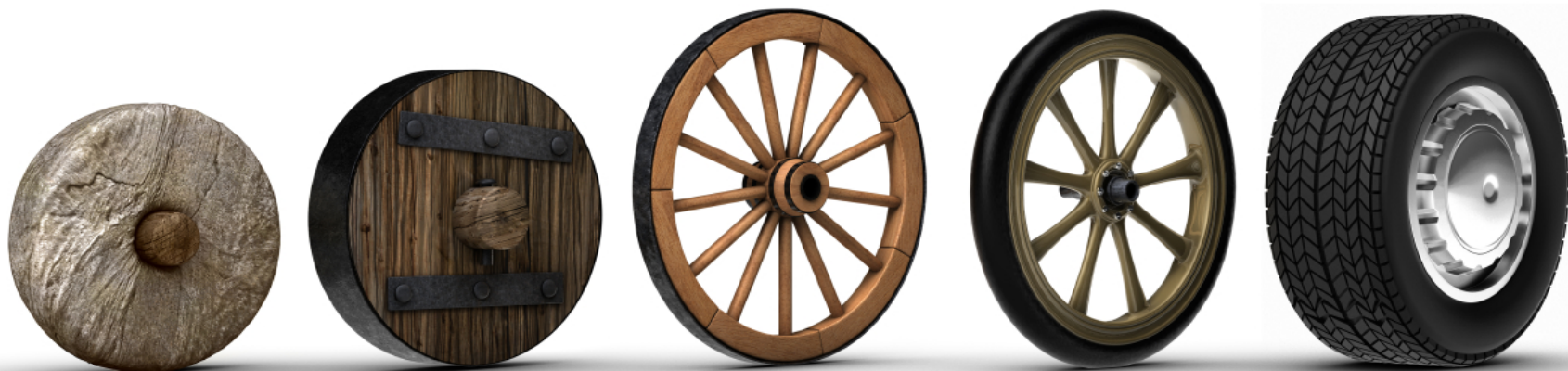


The image shows a screenshot of a 'Games App Widget' interface. At the top, there's a navigation bar with 'games' logo, 'Invite Friends', 'Badges', and 'Help/FAQs'. Below this is a menu with categories: Action, Card, Casino, Hidden Object, Puzzle, Strategy, Word, and Tournaments. A user profile for 'Hi, Nick!' is visible on the right, showing a level of 26 and 150 tokens. A banner below the menu says 'Get 50% more Tokens with each purchase! 16 hours left' and includes a 'Get More Tokens' button. The main area features a large red banner announcing 'You won 7,000!' with a 'close' button. Below the banner, five reels are shown with values: 1000, 2500, 2500, 1000, and a question mark. A button below the reels says 'Additional All-Reel Spin' with a '10' token cost. The bottom section is titled 'Send a Mystery Gift' and includes a 'Preview of request' from 'games' saying 'I've got a special gift just for you. Accept it before it expires!'. Below this is a search bar for 'Friends not playing Games' and a 'Send' button. A list of friends is displayed, each with a checkbox and their name: A Kamath, Amy Urban, Andrei Kadanov, Arif Abdullah, Carlos Fernando Garcia, Darinka Boeva, Aditya Sheth, Anand Dantu, Andrew Schein, Ashish Joshi, Chris Zaharias, Darko Zlatarsky, Alex Kutsenok, Ananth Gopalakrishnan, Aravindakshan Babu, Brian Walsh, Clayuri Parrilla Sanchez, David J. Kim, Alter Ego, Anbu Gounder, Archi Rajwat, Calvin Low, Dan Wong, and David White. A 'Send' button is at the bottom right of the list.

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

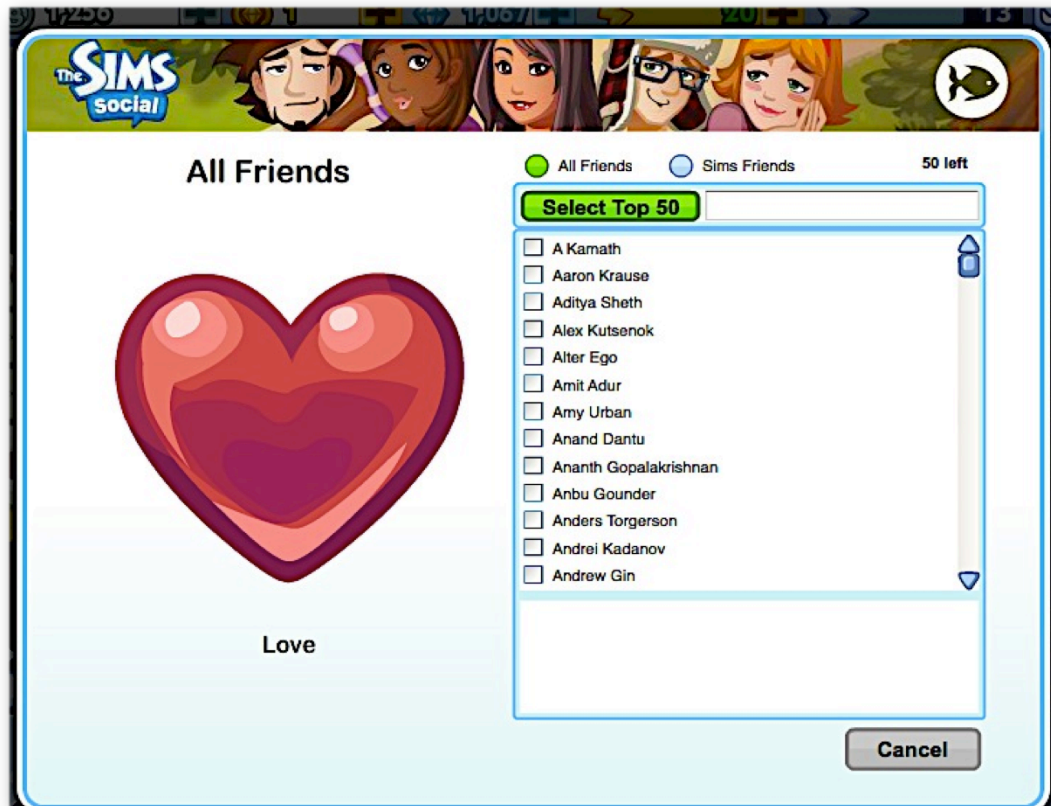
Evolution



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?

☐ 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

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"

[Action](#) [Card](#) [Casino](#) [Hidden Object](#) [Puzzle](#) [Strategy](#) [Word](#) [Tournaments](#) [Tokens in Game](#)



Get 50% more Tokens with each purchase! 13 hours left [Convert 250 Credits to 315,000 Tokens](#)

Thank You for Playing!

 Player Points
This Session: [?](#)


1
Level 61 — (1/10)


Get back in the game!
And get a **50%** Buy Back Bonus!

Get ~~15,000~~ 22,500  for 20 

Other Purchasing Options

Other games you may like:


Wheel of Fortune Slots
[Play »](#)


Fishdom Social
[Play »](#)

[« 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 header. The header contains navigation tabs: Action, Card, Casino, Hidden Object, Puzzle, Strategy, Word, and Tournaments. A 'Tokens in Game' button with a coin icon is on the right. Below the tabs, 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 'Player Points' section showing a star icon, 'Player Points This Session: ?' (with a question mark icon), a large red '1', and 'Level 61 — (1/10)'.

A red box highlights a 'Get back in the game!' offer. The text inside the box reads: 'Get back in the game! And get a 50% Buy Back Bonus! Get ~~15,000~~ 22,500 for 20' (with a coin icon). Below this is a link for 'Other Purchasing Options'.

To the right, an 'Other games you may like:' section displays two game tiles: '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"

- 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
[-] /facebook/flashAdjustTokens	3,133,443	116,779,399	37.27	4.01
_all	94,544,196	96,263,682	1.02	
[+] com.videocritic.dao.I_UserDAO.readUserByFacebookUserIdWithAppPropertie	3,133,408	27,518,306	8.78	
[+] com.videocritic.dao.rpg.I_GameDAO.loadOrCreatePerson	3,133,408	22,043,981	7.04	
[+] com.videocritic.email.I_EmailDAO.getEmailPromotion	3,133,408	15,439,375	4.93	
[+] com.videocritic.userjson.I_UserJsonDAO.getCompressedUserJson	3,133,408	14,604,708	4.66	
[+] 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	
[+] com.videocritic.experience.I_ExperienceDAO.readExperiencePointsLevel	14,914	95,428	6.4	
[+] com.videocritic.dao.rpg.I_GameDAO.readFlashGame	13,362	45,438	3.4	
[+] com.videocritic.dao.rpg.I_GameDAO.readCurrentPromotion	4,898	23,536	4.81	
[+] com.videocritic.dao.I_UserDAO.readFacebookApplication	3,804	18,062	4.75	
[+] com.videocritic.dao.rpg.I_GameDAO.readAllPaymentTestTypes	633	7,575	11.97	
[+] com.videocritic.dao.I_AdTargetingDAO.readActiveAdSlots	965	5,895	6.11	
[+] com.videocritic.dao.rpg.I_GameDAO.readFeatureGates	451	2,847	6.31	
[+] com.videocritic.dao.I_UserDAO.readFacebookApplicationByApiKey	257	1,791	6.97	
cachePut	8,950	1,132	0.13	
JSP render	2	0	0	
[+] /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?



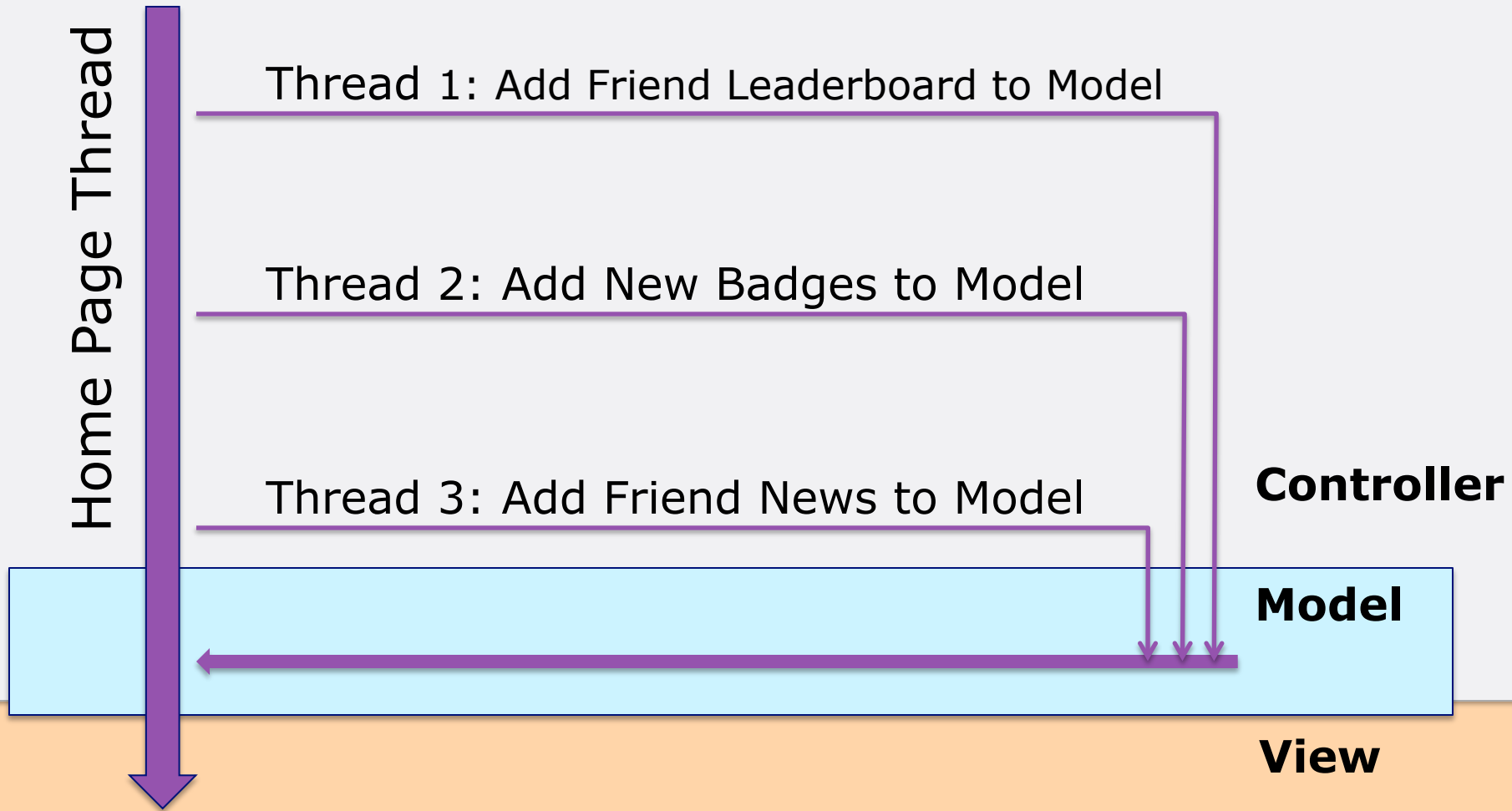
Page Load Optimization

- 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

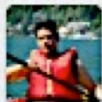


Release Management

- Transparency
- Frequency
- Simplicity



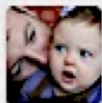
Release Management



Debarshi Kar

5:56 PM

my stuff is looking good.. any issues?



David Tudury

5:56 PM

all good



Debarshi Kar

5:58 PM

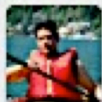
push_build latest app2 app40



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:

Bouncing Balls (1)

ZIP file:

Choose File

No file chosen

Name of primary SWF
in ZIP:

Name of message file
in ZIP (optional):

Upload

Exception Monitor

[Clear](#)
[Deactivate](#)
[Refresh](#)

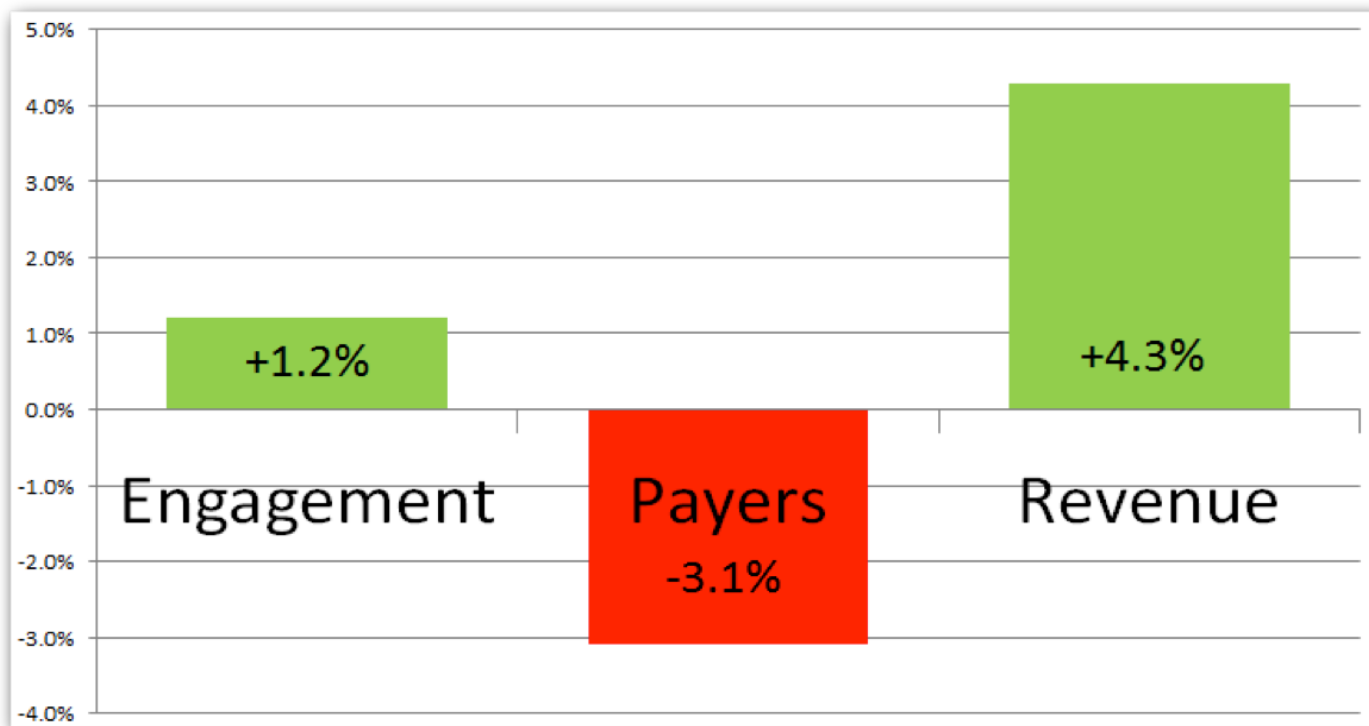
name		error count	count
[+] flash-error-queue		142498	142498
[-] open-graph-queue		7542	9127
name	count		
[+] com.videocritic.facebook.api.FacebookException	7526		
[+] org.json.JSONException	10		
[+] java.net.SocketException	6		
[+] facebook-api-job-queue		6700	306337
[+] /facebook/rpgFacebookCredits		365	265409
[+] /facebook/rpgArcadeTokenGift		261	54231

Data Warehouse

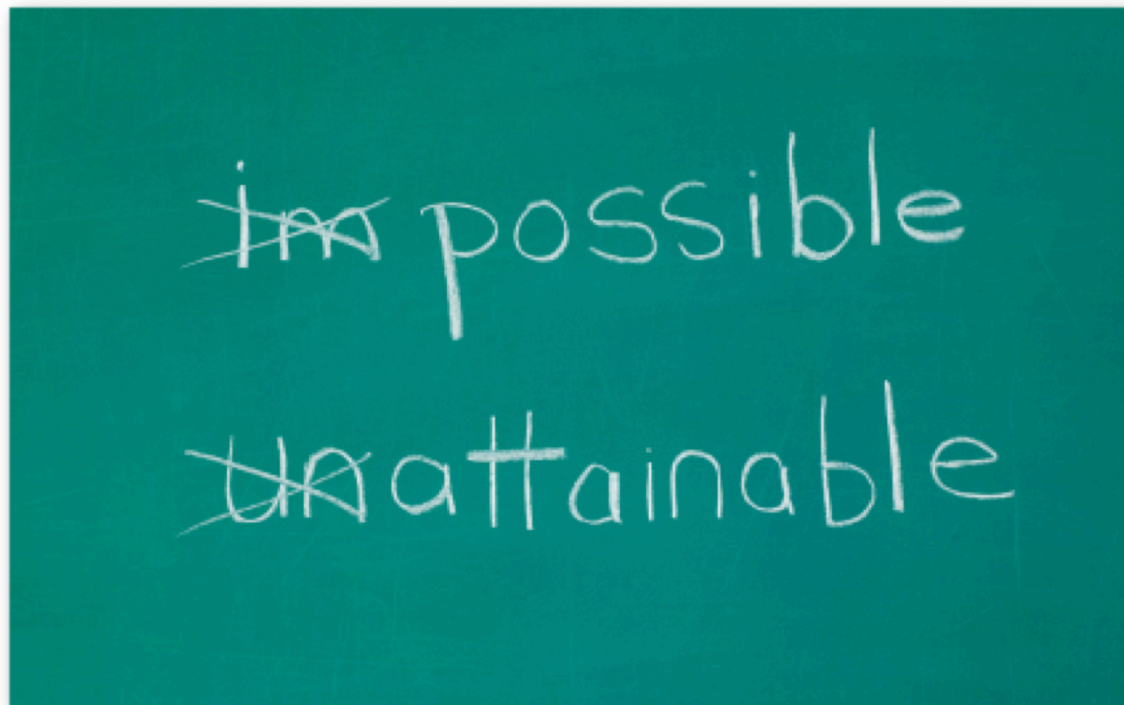
- Using Vertica for DW:
 - Forget "old school" data-warehousing
 - Write plain SQL, query BILLIONS of rows in ms



Cohort Report



Closing



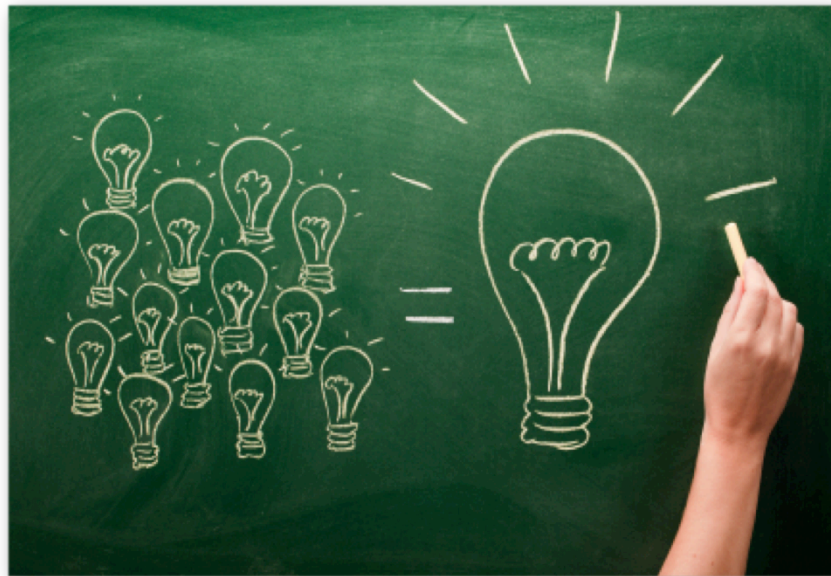
Empower Engineers

- 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