Designing for Everywhere

Raph Koster, areae

What the heck??

You may have noticed this lecture has one of the vaguest topic descriptions you have ever seen.

What's it about?

- **Got this new startup thing going**
  - Been watching the Web a lot
  - Want to be on all devices
- **Also been pondering game grammar**
  - New book in the works, allegedly
- **Does one inform the other?**

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The question

- **What do these have in common?**













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O RLY?

A provocation

- **Basically, I am going to assert we usually think wrong about what games are**
  - They are not the interface
  - They are not the display
- **Design for everywhere is about cutting those two elements from the equation**

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Topics

1. **The new platform**
   - Web 2.0 in shorthand
2. **How Games Work**
   - From a game grammar point of view
3. **Bridging the gap**
   - Hopefully concrete advice and examples

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The new platform: the Social Web

The overview

- Tags, not taxonomy
- Participation, not publishing
- Radical trust
- The three R's
- Decentralization
- Long Tail
- Data not code
- Perpetual beta
- Remix and mashup
- Emergence
- Services not products
- Collective intelligence

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Participation

- **Web 2.0 is premised on users contributing hugely**
  - "Radical trust"
  - Remix and mashup
  - Cult of the amateur
  - Quality not required
  - Distrust of centralized authority
    - *Ex: tags, not taxonomy*

Decentralization

- **Abandonment of the publisher model**
  - Long Tails
  - Niches
  - Duplicate content
- **Different distribution channels**
  - Digital only
  - Monetize passion, not trials
  - Slow openings, not big

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Services

- **Instead of products**
  - Data, not code
    - *(Hard for games! We make **systems!**)*
  - Perpetual beta
- **Collective intelligence**
  - Distributed activities
  - Group filtering of content

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The three R's

- **Ratings**
  - The participatory Web is premised on metadata on "content"
- **Rankings**
  - And metadata on "users"
- **Reputation**
  - Adding up to a user-driven system of surfacing user-created content

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Run anywhere

- **Open standards**
  - XML
  - RSS
  - HTML
  - CSS
- **Common platform**
  - LAMP stack
- **“Above the level of a single device.”**

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In contrast

- **Games are moon shoots**
  - Just contrast to Blizzard's MO!
  - Open big
  - High production values
  - Monetize trials
- **Central authorship**
  - Closed platforms vital to monetization
  - Big on narrative and aesthetics

How Games Work

What is game grammar?

- **The assertion that all games**

  (And sports, puzzles, and in fact most cognitive tasks)

  work the same way

  - And this functioning can be notated or diagrammed
  - And this understanding can help make games better

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Layers

- **Model**
  - The mathematical system representing some aspect of reality
- **Statistical variations**
  - Variation on numerical inputs into the model
- **Theme**
  - The real life situation that the model analogizes
- **Dressing**
  - The representation of the model to the user

Model

- **A black box algorithm**
  - The purpose of gaming is to determine what the algorithm is and apply it
  - *Scorched Earth* & *Worms* share a core model
  - We often term a model "a game," or "a genre."

My grammar

Nested and sequential atoms

- Each with success and failure states
- "Depth" measured by nesting
- "Breadth" measured by parallelism

Each atom should hit key factors

- Topology, past interaction, skill required, etc
  (see GDC '05, ETech 07)

Notion of "imported" systems

- Human psychology, real world physics, etc

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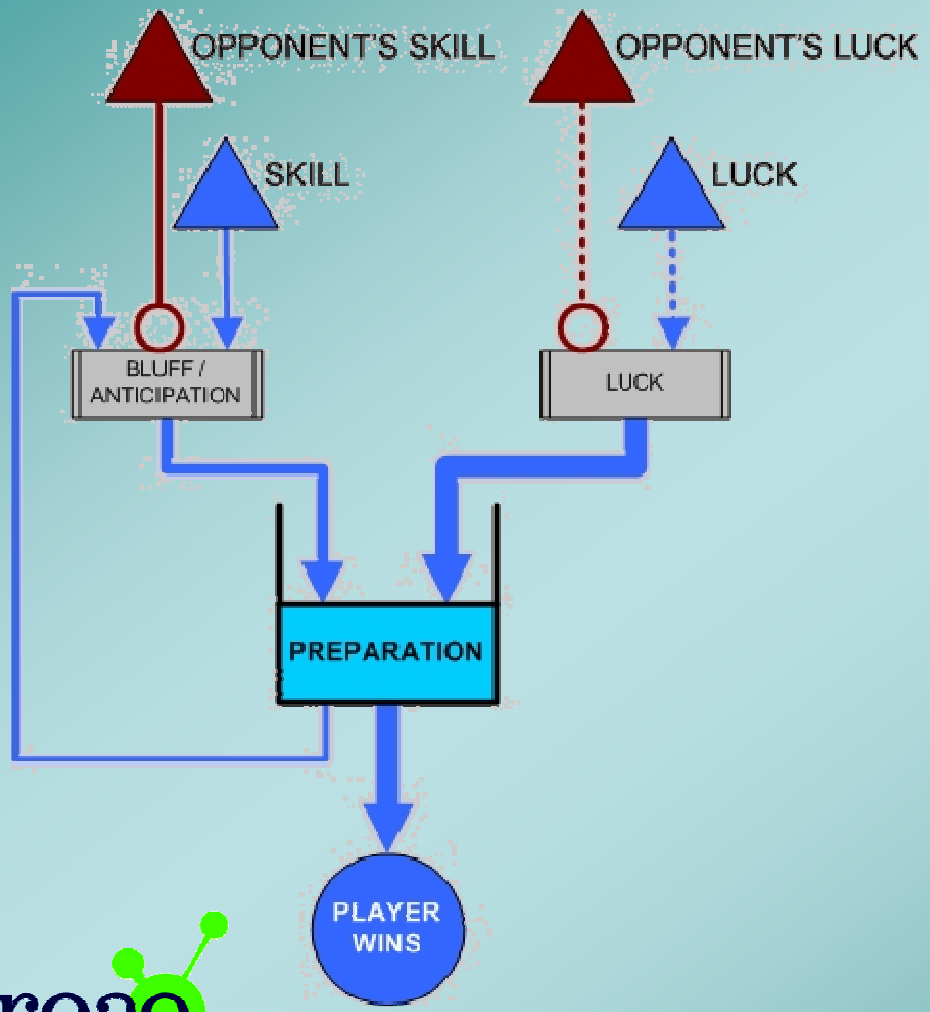
Stephane Bura's grammar



- **Uses Petri Nets**
  - Notation system premised on my grammar
  - Extends to a more sophisticated level for design error trapping

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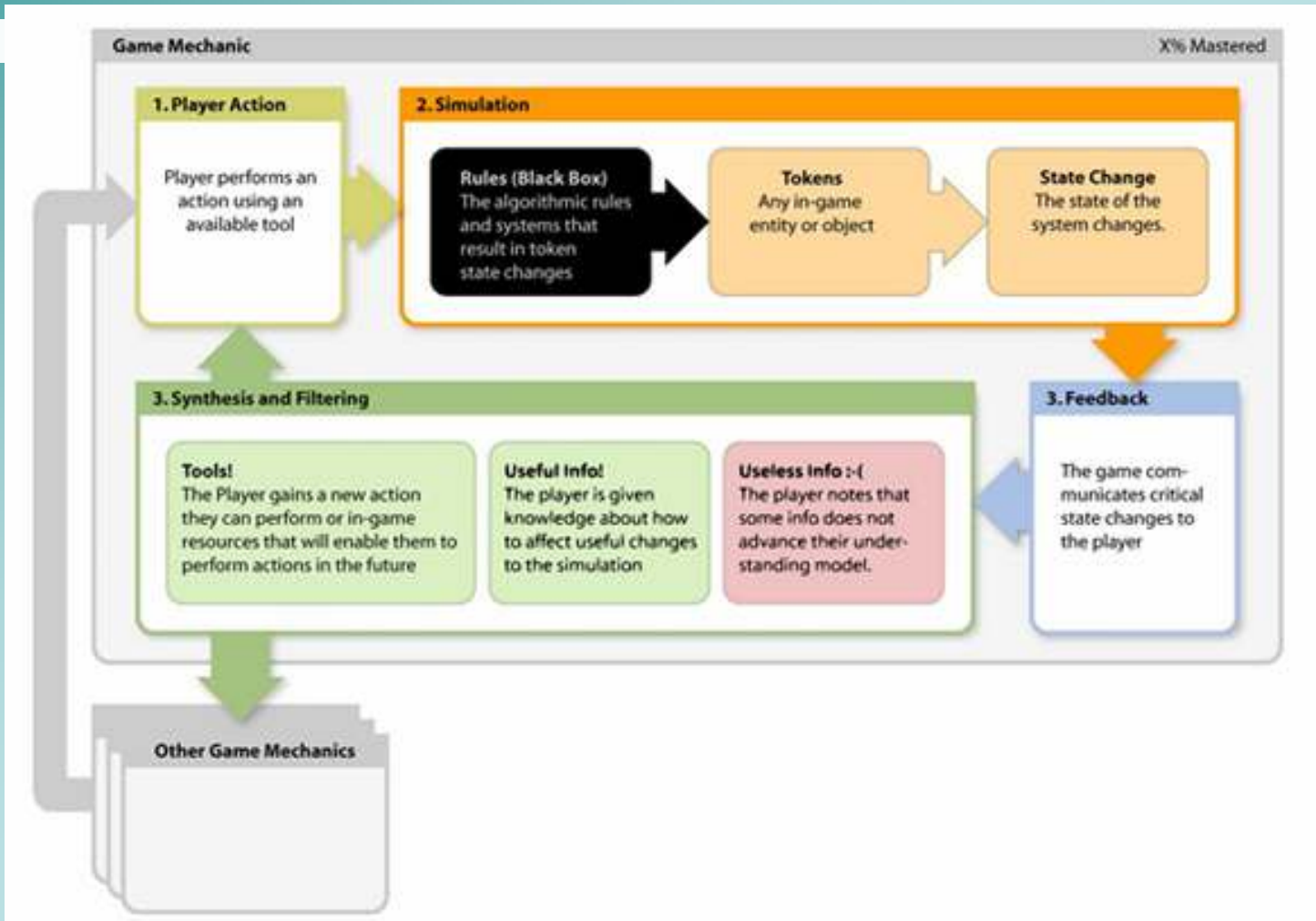
Dan Cook's alchemy



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Commonalities

- **Games as atomic skill challenges**
- **Emphasis on player learning**
- **Chaining of atoms to measure difficulty (even quantitatively)**
  (See ITI Techmedia/Metaforic sponsored session, GDC 07)
- **De-emphasis on interface and presentation**

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Comparisons

- **Mechanics, Dynamics, Aesthetics**
  - Grammar strongly echoes the mechanics layer, and purposely drops the aesthetics layer
  - Dynamics are implied
- **Constituative rules per Salen/Zimmerman**

Model as algorithm

A game can be seen as a collection of *f(n)* equations.

- Put in “rock,” and get back rock, paper or scissors.
- Put in angle and muzzle velocity, assume wind, and try hitting a worm

Expertise is basically data-analysis

- Iterate, and determine the algorithm from the output
- Then successfully use the curve predictively

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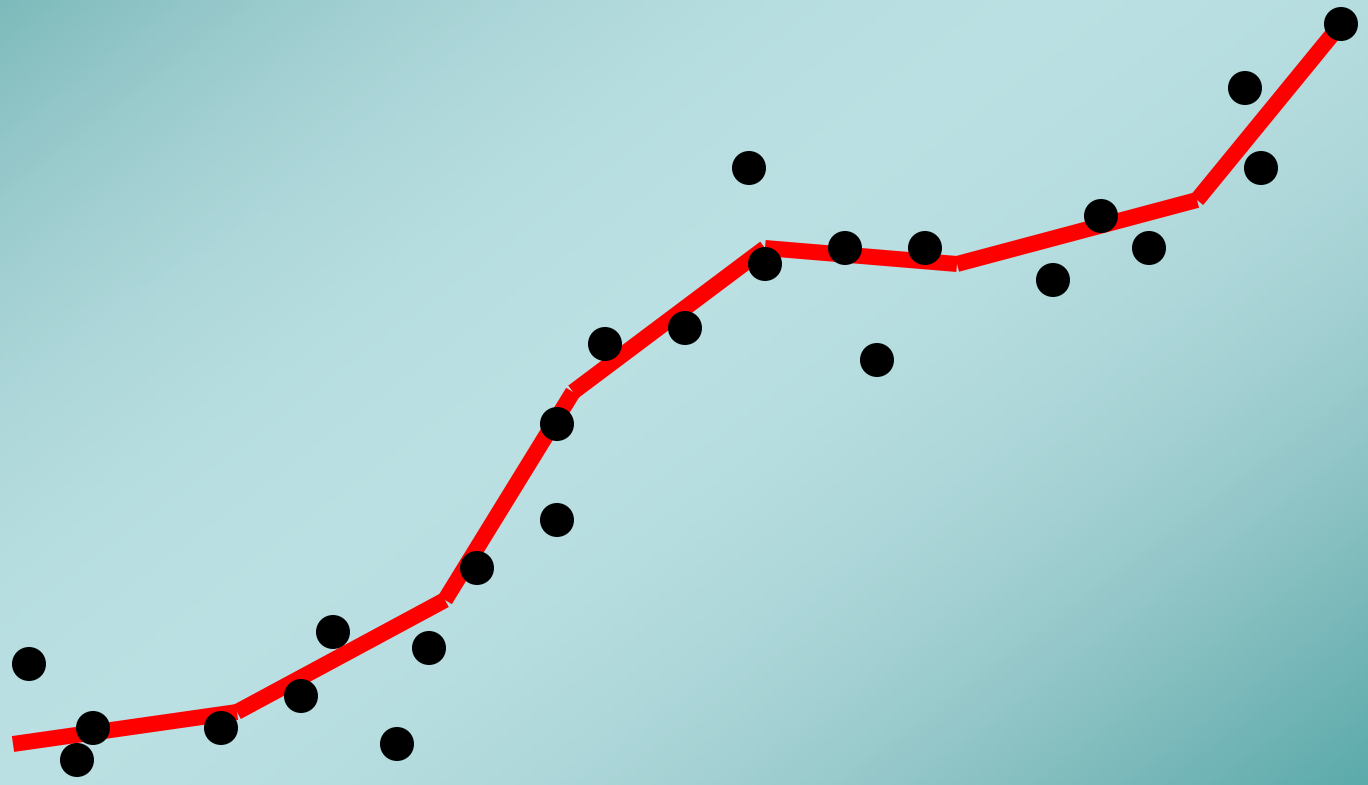
Curve fitting



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Theory of Fun

This view of games ties in nicely

- The underlying system to "grok" is the blackbox algorithm
- Mastery of patterns is rewarded with a burst of endorphins

See AGC 2003, SGS 2004, TFall 2005, book; also Prensky, Gee

Every atom is an obstacle to master

- Each button, each level, each move, each UI element, each monster, each …

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Classic models

- **Reaction time**
  - Most sports and sport-like games
- **Trajectory calculation**
- **Calculus of consumption**
- **Weighted graph**
- **Influence spheres**
- **Odds calculation**

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Models as graphs

- **It is possible to use graph theory to treat all models as traversal problems**
  - Construct a weighted graph
  - Each node is bounded by a success/failure state
  - Each node is quantified based on odds of success
  - The player A*'s through Halo 2
    - *cf Wired article on tuning Halo*

The social dimension

- **Games are inherently social**
  - Except videogames, sort of
- **Used throughout human culture as teaching tools for both youth and adults**
- **All games have player and opponent:**
  - The self
  - Another player
  - A deterministic model

Symmetry

- **Symmetric games**
  - Self and opponent have the same goals, graphs, etc
- **Asymmetric games**
  - Self and opponent have differing goals
  - Important to realize that a deterministic model is still "a player"
    - *"Shall we play a game?"*

Simultaneity

- **Directly competitive games**
  - Players play against each other, then measure results
- **Parallel games**
  - Players play a different game, then measure their relative results
    - *Foot races, leagues, XBLA achievement points*

Roles

- **"Team" based games**
  - Generally have key roles
  - Intensity of contribution varies by role
  - Parallel games played within an overall symmetric game
    - *Most team-based sports (symmetric)*
    - *Party-based MMORPGs (asymmetric)*
- **These support limited capacity because roles are fixed**

Statistical variations

This is often termed "content"

- Placement of the worms
- Stats on the orc
- Rain or windiness on the racing track
- Chess problems

The model is the same, the terms in the equation are different

- "For given values of y…"

Iteration

Games are generally looping

- In order to allow the user to build mental models

Therefore going too deep before a failure is bad design

- The user cannot attribute a cause to their failure, and often quits
- Broadly successful games punish very lightly

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Time

- **All games are turn-based**
  - Or rather, phase-based
  - In some, the time term is infinite (or socially determined)
  - In others it is constrained by model execution speed
- **Time-constrained choices bind you to certain platforms**

Pushing to the theme

- **The underlying model is "what the game is about."**
  - Abstract themes
- **A good theme will match the model**
  - Trajectory calculation is a good match for shooting games – and even photography
  - Not a great match for a game about being a tree

What is "interface"

- **A misnomer**
- **Three sorts of interface:**
  1. Inputs
  2. State information
     - *Graph*
       - *The "world"*
     - *Tabular*
       - *Hit point bars, etc*
  3. Feedback information design
     - *Causal feedback (e.g., the "diff" from last state, what your command actually caused to happen, including the opponent's reaction)*

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Inputs

- **Strongly shape the user experience**
  - But are "remappable"
  - Even automatable
  - Are never analog (even though the controller might be)
    - *In fact, are generally binary*
- **Mastering one is a game atom itself**

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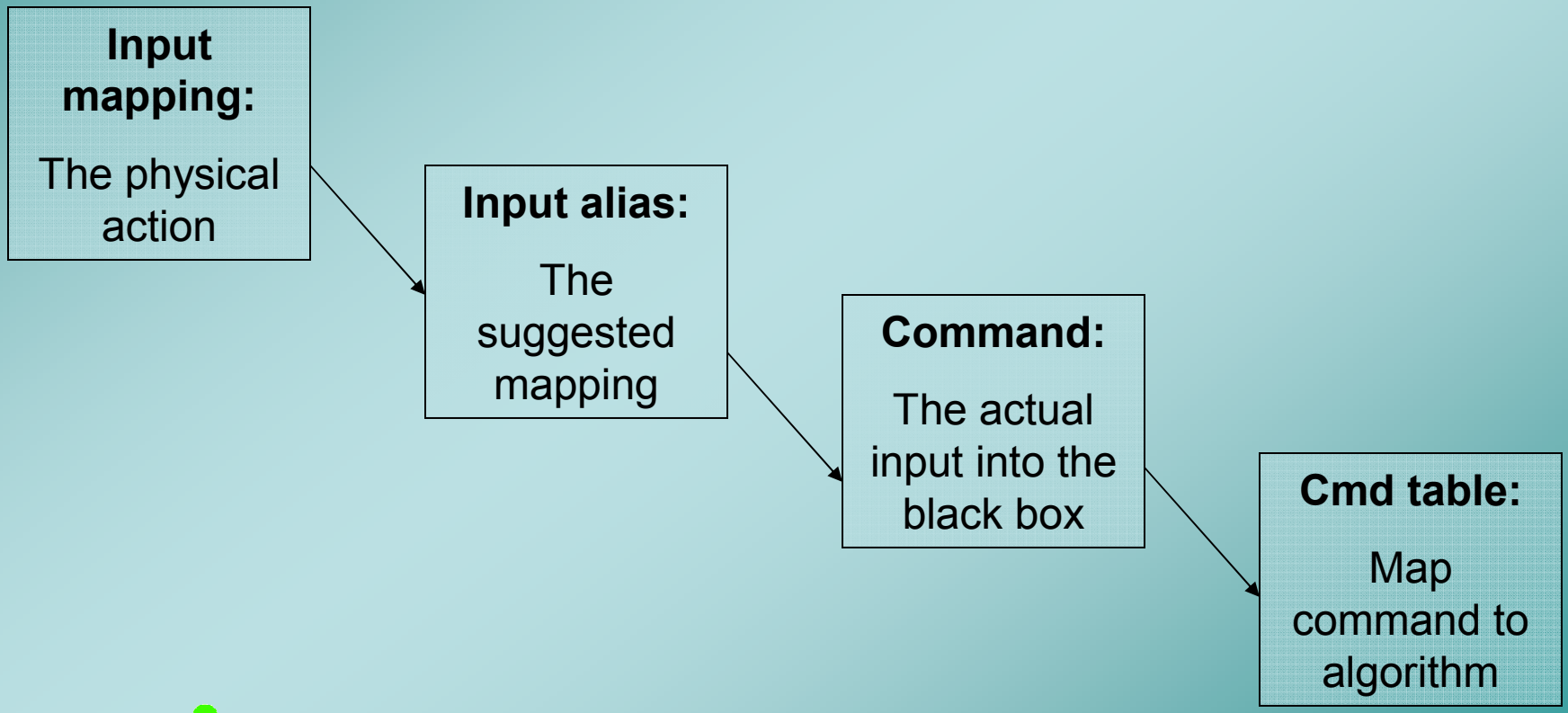
Diagram of inputs

- **What we think of as simple isn't**



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Outputs

- **Typically broken into representational models**
  - But this is by convention
    - *"It begins to rain." in EQ vs graphical weather*
    - *Rogue in ASCII versus a tileset*
- **Can also be seen as filtered**

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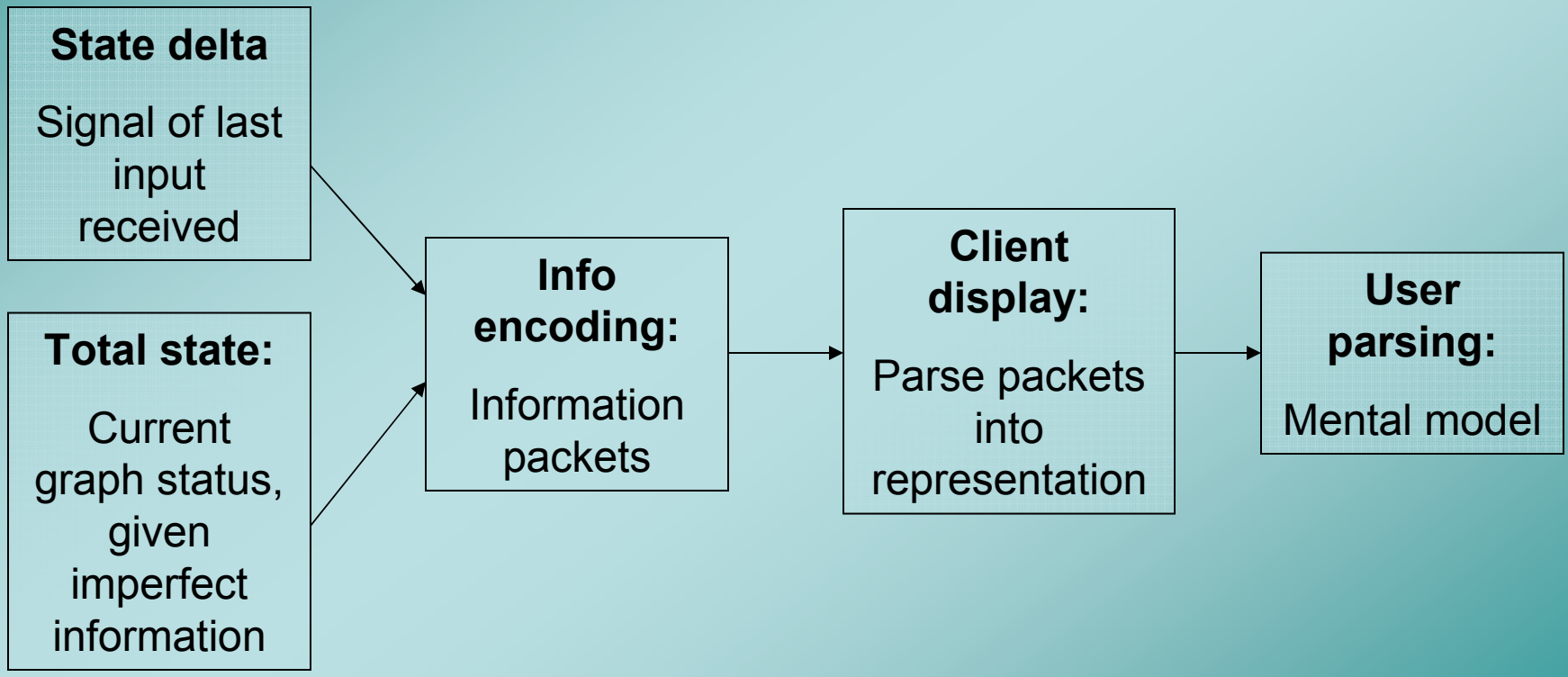
Diagram of outputs

- **Output is also filtered**



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Dressing

May take any form

A great example is from Mahk LeBlanc, cited in *Rules of Play*

X	X	O
O	X	X
	O	O

Also consider

Chutes & Ladders

Pac-Man vs Q-Bert

2	9	4
7	5	3
6	1	8

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Risk

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Bridging the Gap

The game has changed

- **The hot platform is the Net**
  - Meaning, any device!
- **The hot audience is the non-gamer**
- **The hot feature is other players**
- **The hot technology is connectivity**
- **The hot game is a mini-game**
  - Meaning, one with little nesting

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Considerations

- **Input complexity**
  - Currently, haptics are hot in proprietary platforms, but this drives lock-in, not “play everywhere”
- **Model complexity**
  - Our core gamer audience is graduate level in model analysis in most genres
- **Output requirements**
  - We design from representation and inputs inwards rather than the other way around

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Reconsidering inputs

Interfaces have been a huge barrier for users

- 1972: Pong. One “analog.”
- 1979: Atari. 3 binary.
- 1985: Mac. 2 “analog” and one binary.
- 1985: NES. 6 binary.
- 1994: PS1. 14 binary, 4 analog.
- 1997: Dual shock: 12 analog, 8 binary

And so on… chunking helps.. But only for those who grok it

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Reconsidering outputs

Outputs can change the skill atom

A 2d positional challenge in text will be "a different game."

But if they don't, you have freedom to alter to suit

- Camera angles
- Art
- Etc

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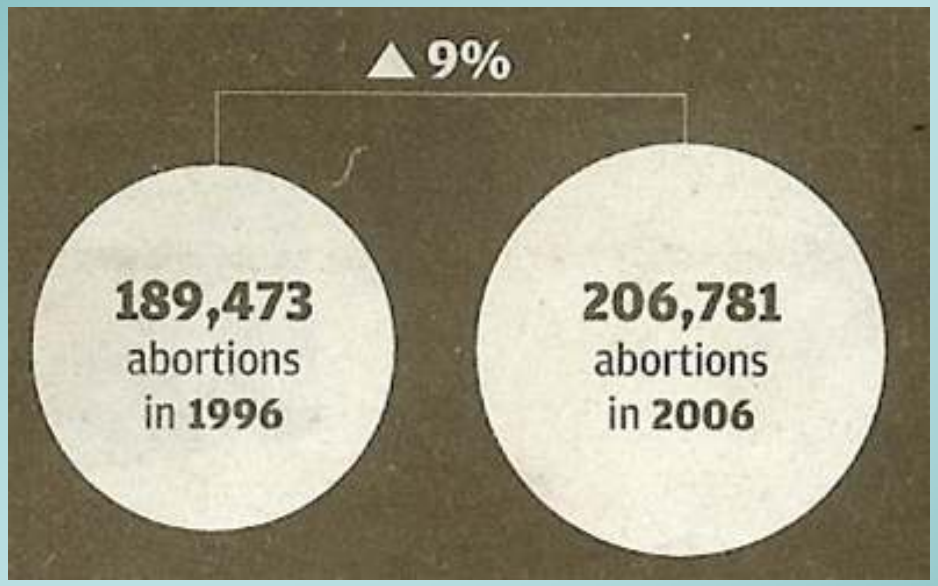
Skill curve for outputs



Reading info design is a skill

These circles actually show a 25% difference

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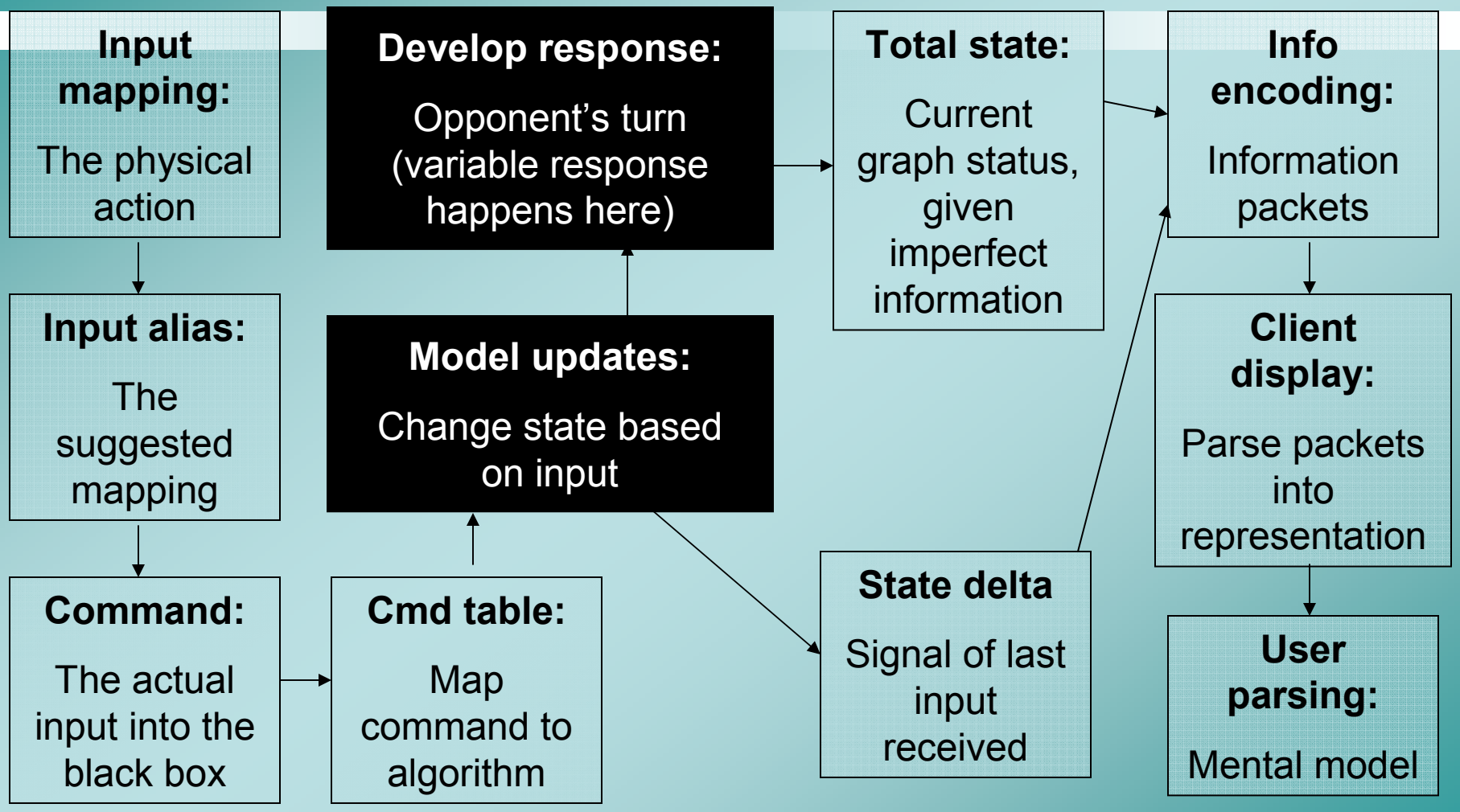
+86 Mana
+36 Mana
New Frostbolt Record!
652
Frostbolt

Overall game model



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The Web platform

- **Asynchronous**
  - Users issue requests, receive responses later
  - Requests may or may not update a state model (e.g., a database) on the server
- **Parallel or orthogonal**
  - Designed for massively parallel usage
  - For differing tasks
- **Representation agnostic**
  - Data surfaced in varied ways, even skinnable (CSS)

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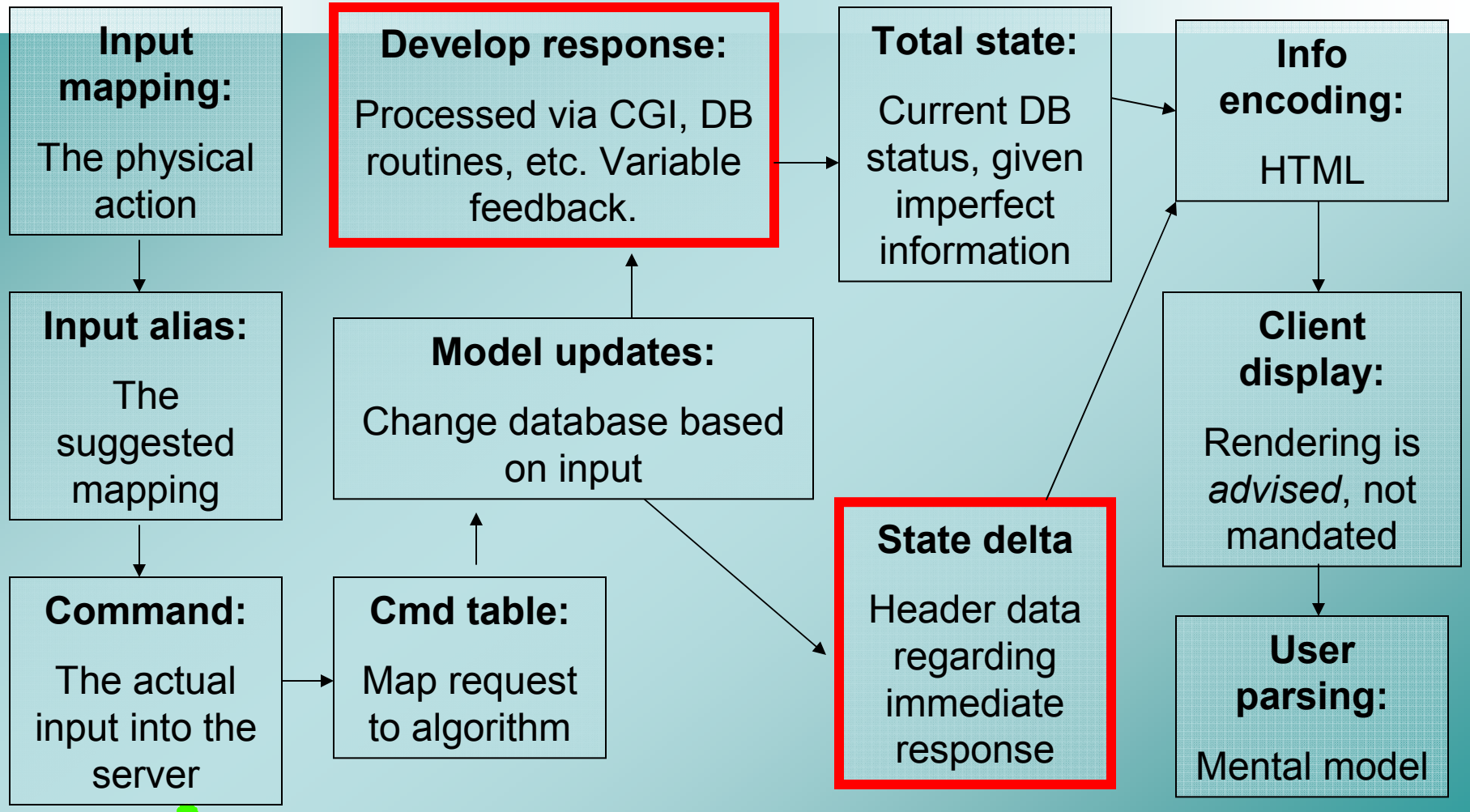
Overall web model



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Key lesson translated

Too often we mistake "what the game is."

- Inputs shape it
  - *and provide barriers to interaction*
- Outputs affect the user mental model
  - *And provide barriers to interaction*

But the real game is the black box

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Architecture

Inputs

Commands

Triggers to the model

Model state updates

Statistical tables

World state representation

Info design representation

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What works

Model first	***The system is the game***
Universal inputs	***Any button will do***
Long phases	***Take your time***
Short decisions	***Be done fast***
Massively parallel	***Side by side***
Extended accumulated state	***Save your profile***
No roles	***Classless***
Representation agnostic	***Draw it however***
Open data	***Change it however***

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What doesn't

Short phase lengths for consequential choices	***Twitchy!***
Inputs locked to commands (platform lock)	***This game only works with this custom touch-sensitive dance mat stylus***
Models reliant on specific info designs	***If it's not 3d it won't work***
Models reliant on prior art	***If you played the first three, you'll feel right at home...***
Narrative lock	***If you tamper with our story, you will undermine our extensive critique of Randian objectivism!***

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Design for everywhere

Simple info design

Bars, text, tables, grids

Every game can be shown on a grid

or other simple graph

Constrain number of inputs

Flash supports keys plus 1 mouse button

Add graphics last

Design in “blue squares”

Design massively parallel

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Parallel models

- Badges
  - *Achievements, etc*
- Ratings
  - *Skill, or social*
- Rankings
  - *High scores, etc*
- Reviews
  - *And tagging*
- Gifting
  - *Reciprocity*
- Networks
  - *Social standing*
- Leagues
  - *Segmentation*

Small games nested within parallel models is the way to go.

Pretty much any game can serve, as long as it is not "the game" but instead "a minigame."

User investment must reside at the metagame level.

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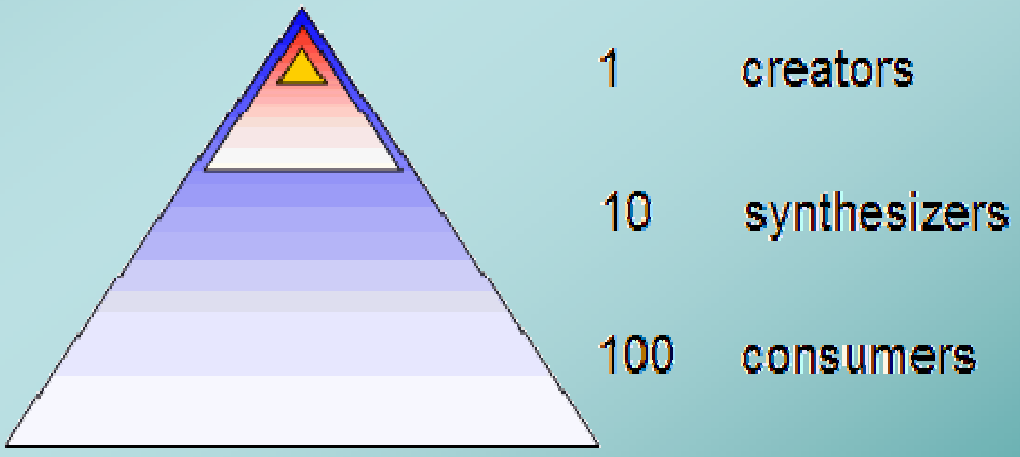
Sponsoring modding

Data, not systems

Front ends/skinning

Niches are often driven by skin



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The Scoreboard:
what they have in common

Club Penguin

✓	***The system is the game***
✓	***Any button will do***
✓	***Take your time***
✓	***Be done fast***
✓	***Side by side***
✓	***Save your profile***
✓	***Classless***
✗	***Draw it however***
✗	***Change it however***

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IMVU

✓	***The system is the game***
✓	***Any button will do***
✓	***Take your time***
✓	***Be done fast***
✓	***Side by side***
✓	***Save your profile***
✓	***Classless***
✗	***Draw it however***
✓	***Change it however***

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Facebook zombies

✓	***The system is the game***
✓	***Any button will do***
✓	***Take your time***
✓	***Be done fast***
✓	***Side by side***
✓	***Save your profile***
✓	***Classless***
✓	***Draw it however***
✗	***Change it however***

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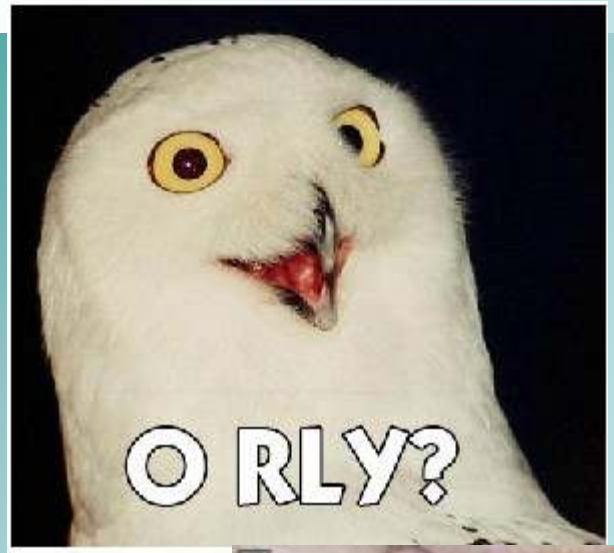
O RLY?/LOLCatz



✓	***The system is the game***
✓	***Any button will do***
✓	***Take your time***
✓	***Be done fast***
✓	***Side by side***
✗	***Save your profile***
✓	***Classless***
✓	***Draw it however***
✓	***Change it however***

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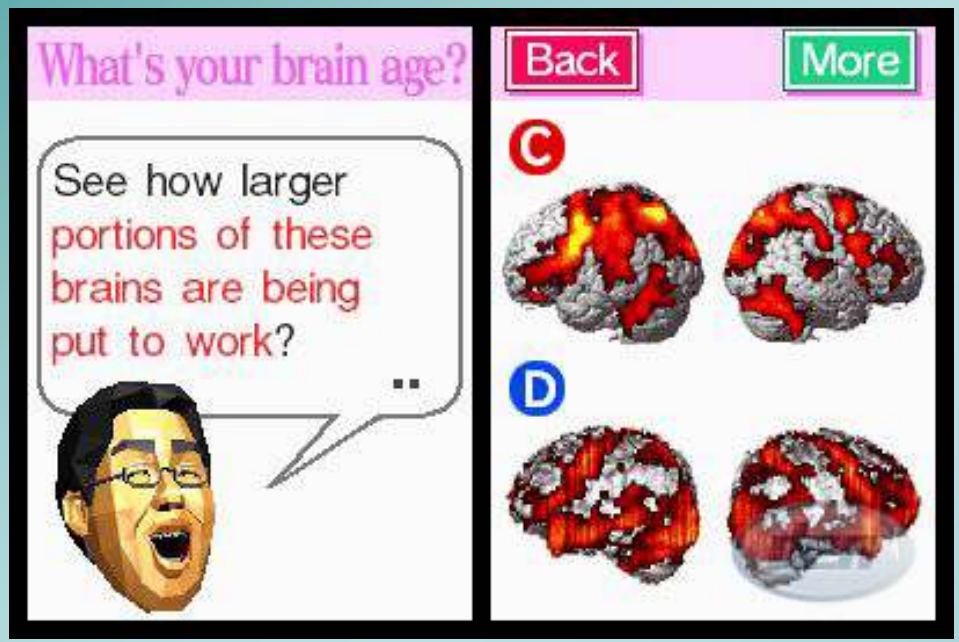
Brain Age



✓	***The system is the game***
✘	***Any button will do***
✓	***Take your time***
✓	***Be done fast***
✘	***Side by side***
✓	***Save your profile***
✓	***Classless***
✓	***Draw it however***
✘	***Change it however***

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HotOrNot

✓	***The system is the game***
✓	***Any button will do***
✓	***Take your time***
✓	***Be done fast***
✓	***Side by side***
✓	***Save your profile***
✓	***Classless***
✓	***Draw it however***
✓	***Change it however***

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Bar trivia

✓	***The system is the game***
✓	***Any button will do***
✘	***Take your time***
✓	***Be done fast***
✓	***Side by side***
✘	***Save your profile***
✓	***Classless***
✓	***Draw it however***
✘	***Change it however***

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ARGs

✓	***The system is the game***
✓	***Any button will do***
✓	***Take your time***
✓	***Be done fast***
✓	***Side by side***
✗	***Save your profile***
✓	***Classless***
✓	***Draw it however***
✗	***Change it however***

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Travian

✓	***The system is the game***
✓	***Any button will do***
✓	***Take your time***
✓	***Be done fast***
✓	***Side by side***
✓	***Save your profile***
✓	***Classless***
✗	***Draw it however***
✗	***Change it however***

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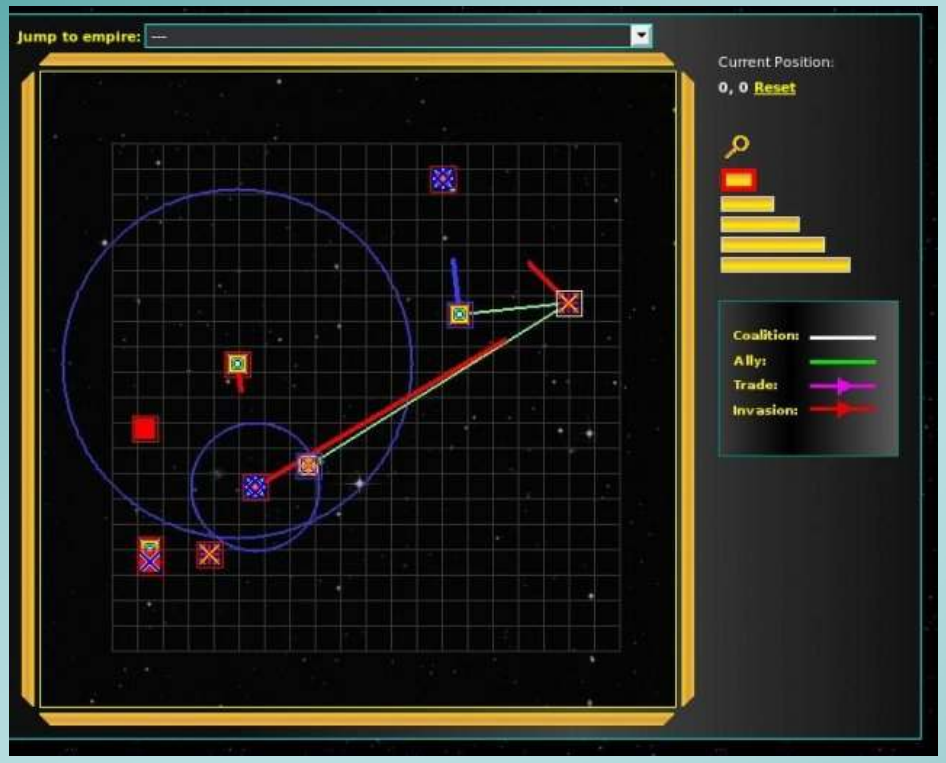
PHP Strategy games



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✓	***Draw it however***
✗	***Change it however***

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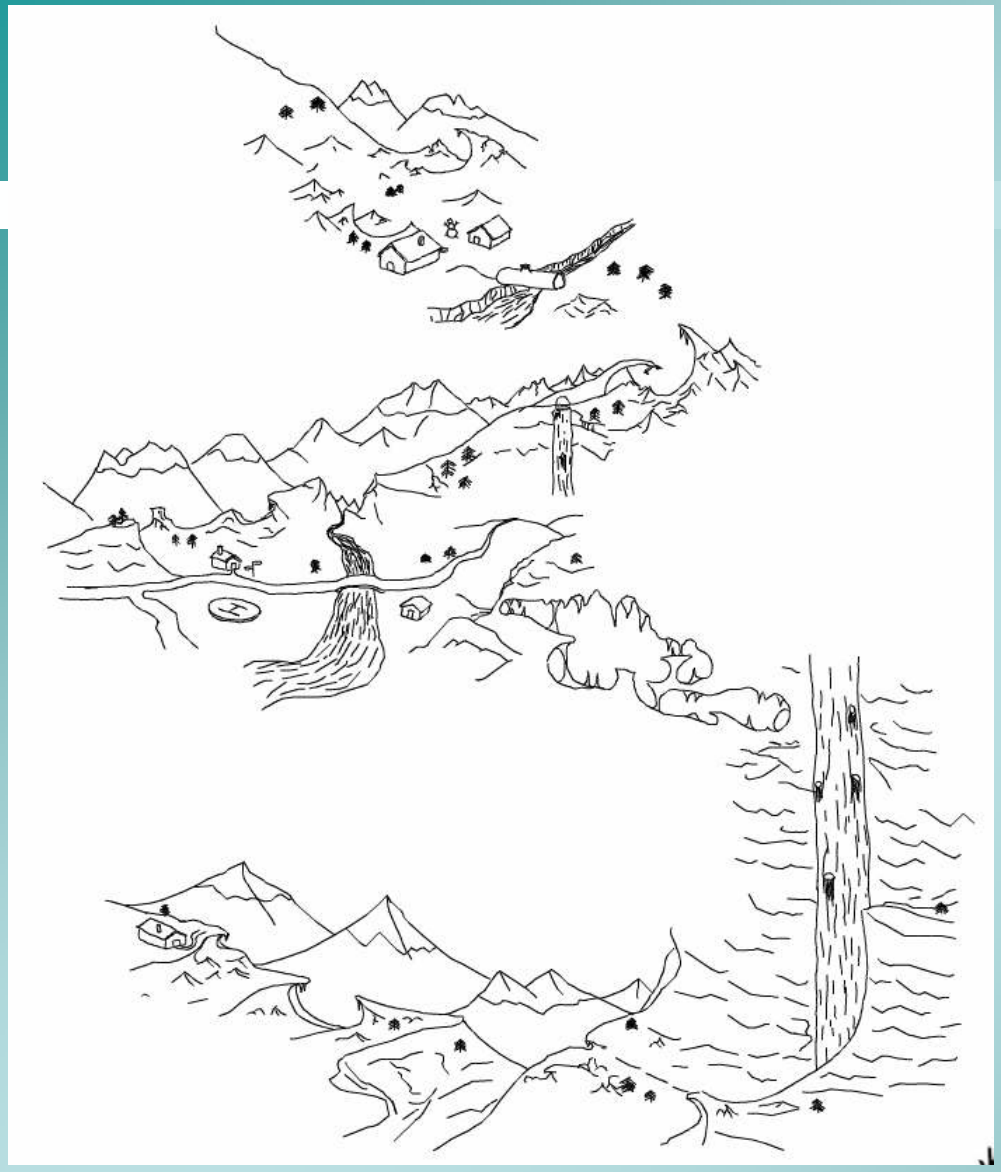
Line Rider



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✓	***Draw it however***
✓	***Change it however***

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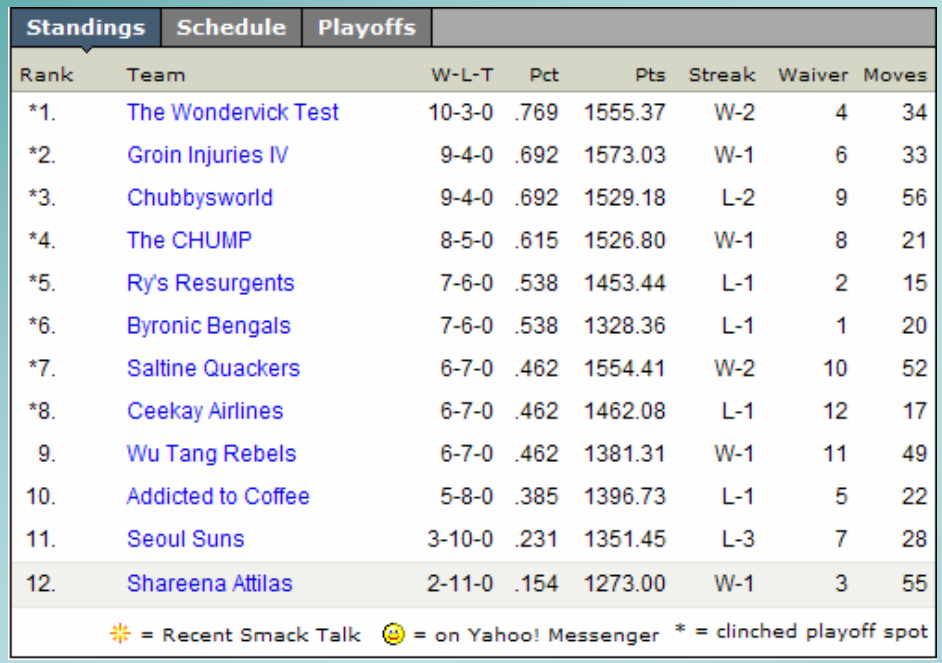
Fantasy football



Standings | Schedule | Playoffs

Rank	Team	W-L-T	Pct	Pts	Streak	Waiver	Moves
*1.	The Wondervick Test	10-3-0	.769	1555.37	W-2	4	34
*2.	Groin Injuries IV	9-4-0	.692	1573.03	W-1	6	33
*3.	Chubbysworld	9-4-0	.692	1529.18	L-2	9	56
*4.	The CHUMP	8-5-0	.615	1526.80	W-1	8	21
*5.	Ry's Resurgents	7-6-0	.538	1453.44	L-1	2	15
*6.	Byronic Bengals	7-6-0	.538	1328.36	L-1	1	20
*7.	Saltine Quackers	6-7-0	.462	1554.41	W-2	10	52
*8.	Ceekay Airlines	6-7-0	.462	1462.08	L-1	12	17
9.	Wu Tang Rebels	6-7-0	.462	1381.31	W-1	11	49
10.	Addicted to Coffee	5-8-0	.385	1396.73	L-1	5	22
11.	Seoul Suns	3-10-0	.231	1351.45	L-3	7	28
12.	Shareena Attilas	2-11-0	.154	1273.00	W-1	3	55

= Recent Smack Talk = on Yahoo! Messenger * = clinched playoff spot

✓	***The system is the game***
✓	***Any button will do***
✓	***Take your time***
✓	***Be done fast***
✓	***Side by side***
✓	***Save your profile***
✓	***Classless***
✓	***Draw it however***
✓	***Change it however***

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Kongregate

✓	***The system is the game***
✓	***Any button will do***
✓	***Take your time***
✓	***Be done fast***
✓	***Side by side***
✓	***Save your profile***
✓	***Classless***
✗	***Draw it however***
✗	***Change it however***

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Bottom line

I don't think it is an accident that the most broadly accessible and popular activities hit most of the grammatical characteristics.

MMORPGs

✗	*The system is the game*
✗	*Any button will do*
✓	*Take your time (early on)*
✗	*Be done fast*
✓	*Side by side*
✓	*Save your profile*
✗	*Classless*
✗	*Draw it however*
✗	*Change it however*

FPSs

✗	*The system is the game*
✗	*Any button will do*
✗	*Take your time*
✓	*Be done fast*
✗	*Side by side*
✗	*Save your profile*
✓	*Classless (in DM anyway)*
✗	*Draw it however*
✗	*Change it however*

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