Scalable Web Programming

CS193S - Jan Jannink - 1/26/10

Administrative Stuff

- We'll be team building on Thursday

- Much went well with assignments

- We'll review some IT type problems

Some APIs Used

- Visualization, Maps, Voice

- Search (google, yahoo)

- Twitter

- Facebook

- SmartGWT

Submitting Code

- Goal: always work out of the box

- Problems
  - package external jar files properly
  - deleted files still referenced
  - Java version (5 or 6)
  - missing DOM elements, or documentation

Weekly Syllabus

1. Scalability: *(Jan.)*

2. Agile Practices

3. Ecology/Mashups

4. **Browser/Client**

5. Data/Server: *(Feb.)*

6. Security/Privacy

7. Analytics*

8. Cloud/Map-Reduce

9. Publish APIs: *(Mar.)**

10. Future

* assignment due

Today's Themes

- Evolution of the browser

- First impressions

- First line of defense

- Agile UI

  - RESTful object lifecycle

Tip of the Iceberg

Browser Prehistory

- Java applets "killer app" for Netscape (1995)

- Applets are heavyweight

  - secure sandbox

  - compilation

  - monolithic

- Javascript

Browser 2.0

- IE5 (1999), Firefox

  - XMLHttpRequest

  - Gmail, Google Maps, Mashups

- Chrome, V8 javascript compiler

- iPhone, Android

- GWT

Headaches

- Incompatibilities

  - threading, javascript syntax, java version

- Performance

  - unpredictability, initial latency

- Security

  - XSS, CSRF, Firebug (debugger)

Flash

- About 90% of browsers have it

- ActionScript is well proven tech

- Environment separate from browser

  - security, cookies, testing

- Coding platform separate

Google Example

- Move all apps to the cloud

- Build faster browsers, better Javascript

  - Chrome

  - V8

- Tune performance for mobile platforms
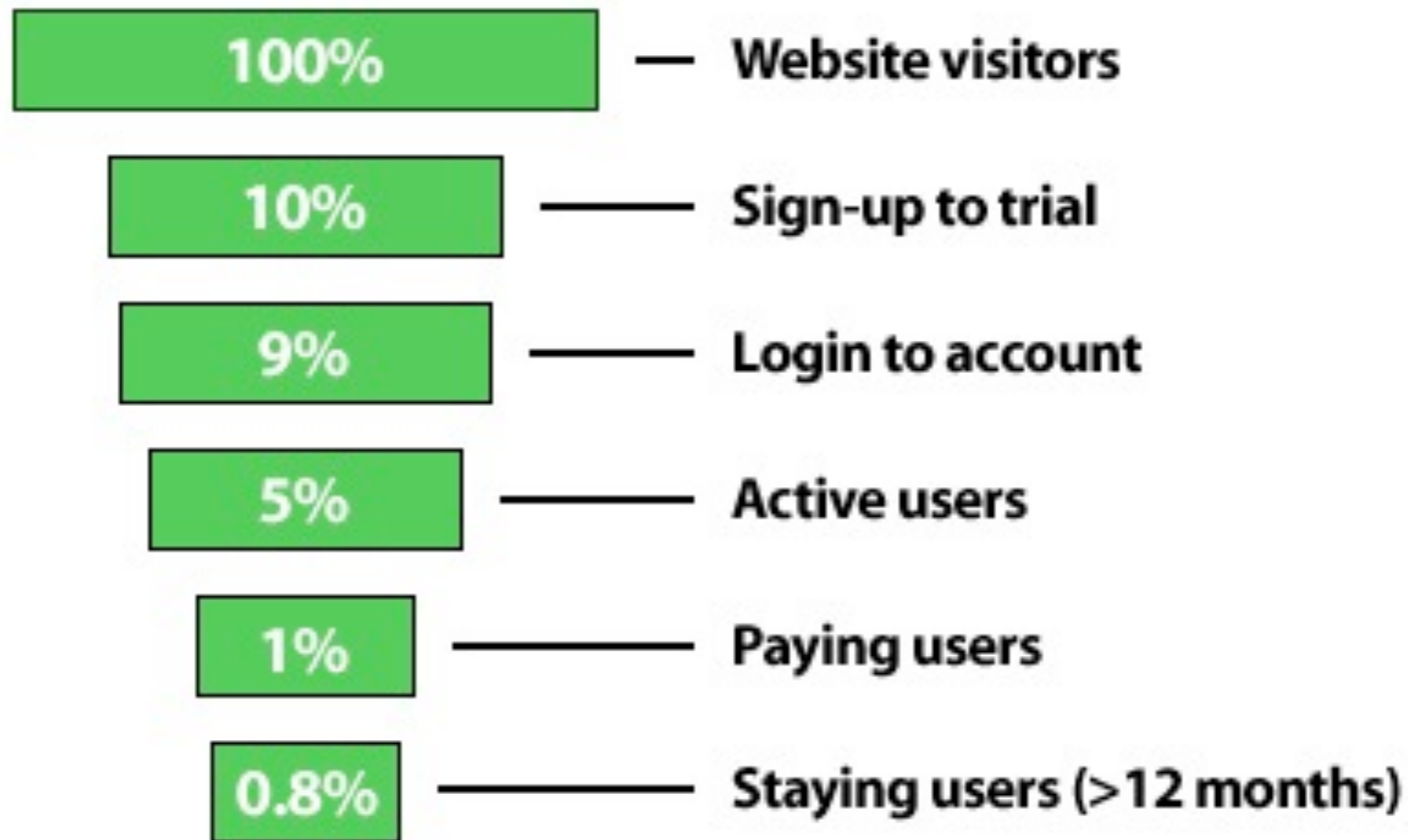
  - Android, Chrome OS

First Impressions
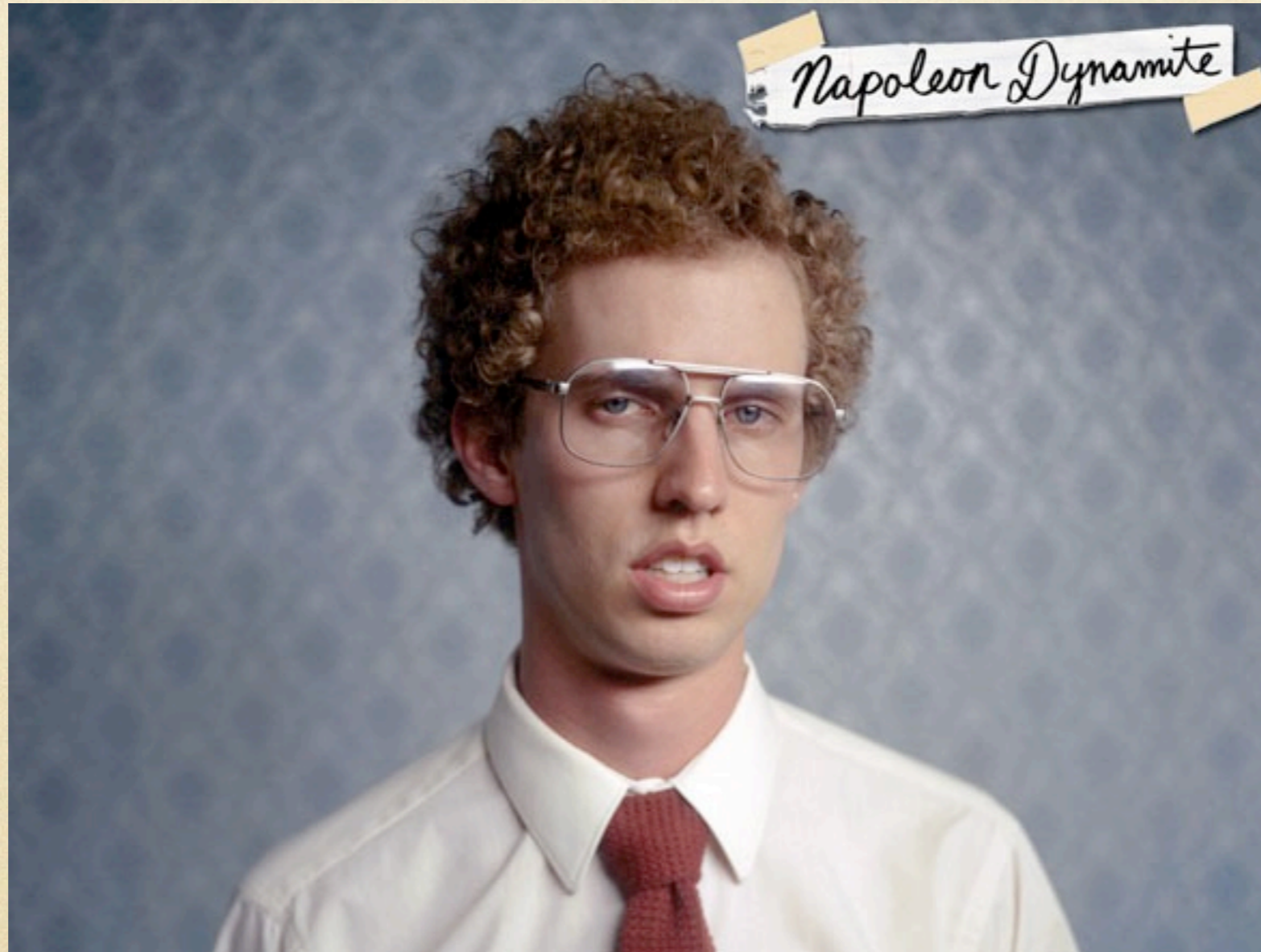
First Impressions

- Pre visit (mouth of the funnel)

  - site referrals, marketing

- Site visit

  - dreaded "What does this site do?" question

- Bounce rate

- Transaction/Signup

The Funnel

More Sophisticated Conversion Funnel

100%	— Website visitors
10%	— Sign-up to trial
9%	— Login to account
5%	— Active users
1%	— Paying users
0.8%	— Staying users (>12 months)

Perfect Mouse Trap

- Simplicity - clear message

- Simplicity - memorable difference

- Simplicity - explainable value

First Line of Defense

- Fundamental security limits on the client side

- Set a defensive bar

    - code compression, obfuscation

    - security is an ongoing process

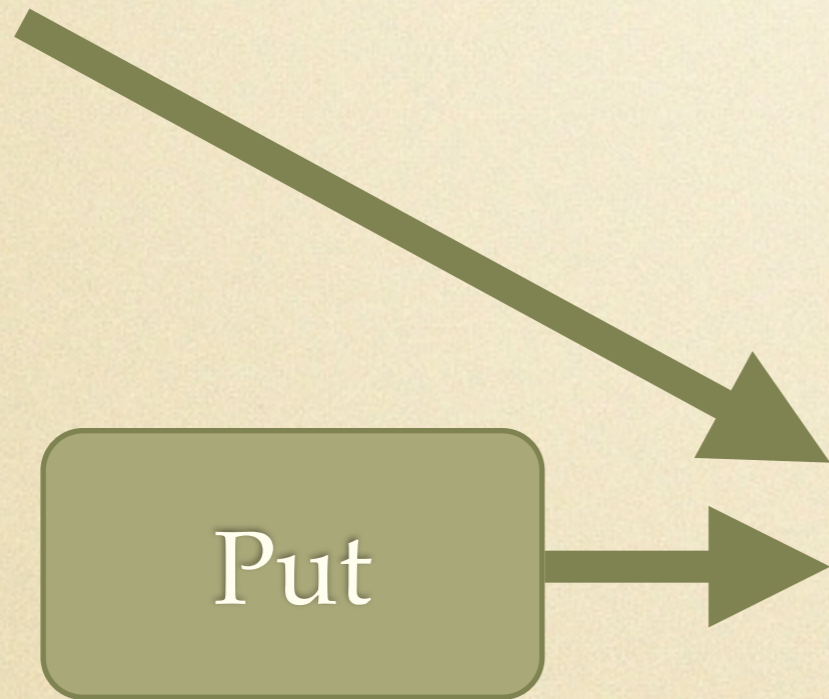- Perform client & server side validation

Agile UI

- Rapid end user feedback loop

- Site instrumentation

  - heat map visualization

  - Google analytics

- Roll out learnings, Repeat cycle

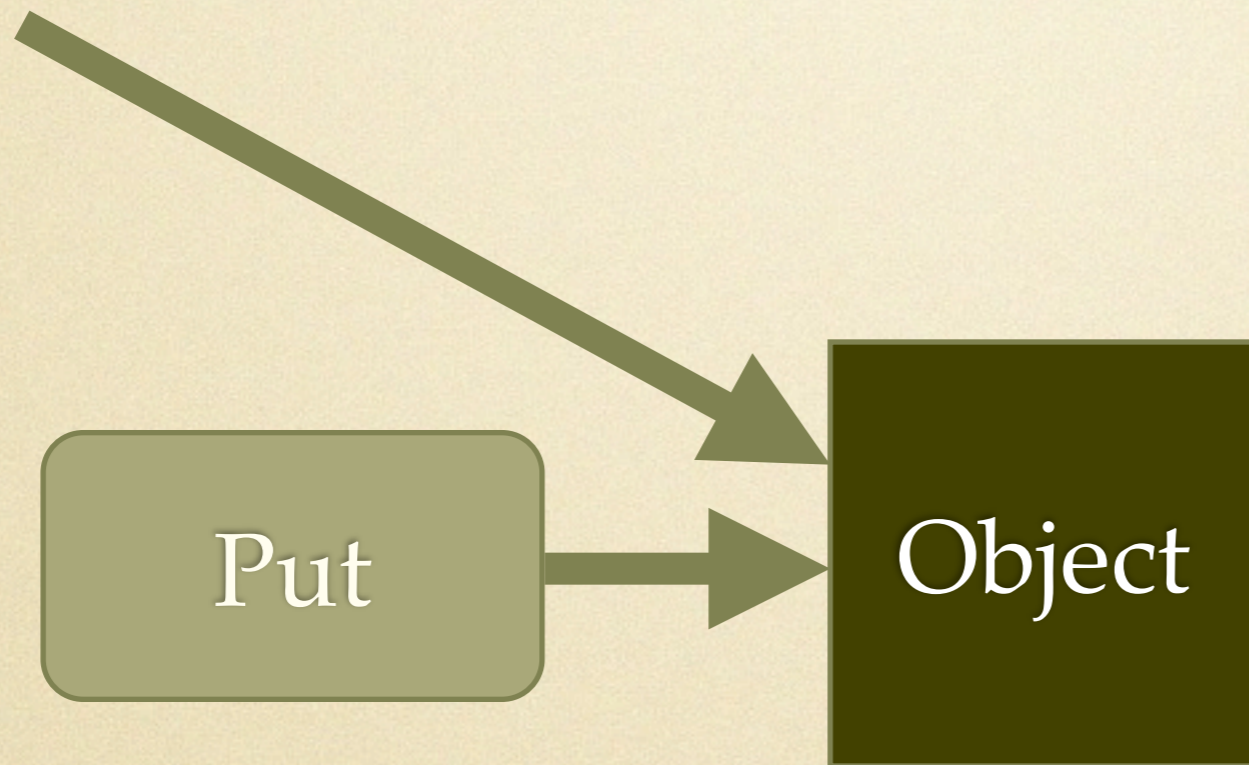- Avoid feature bloat
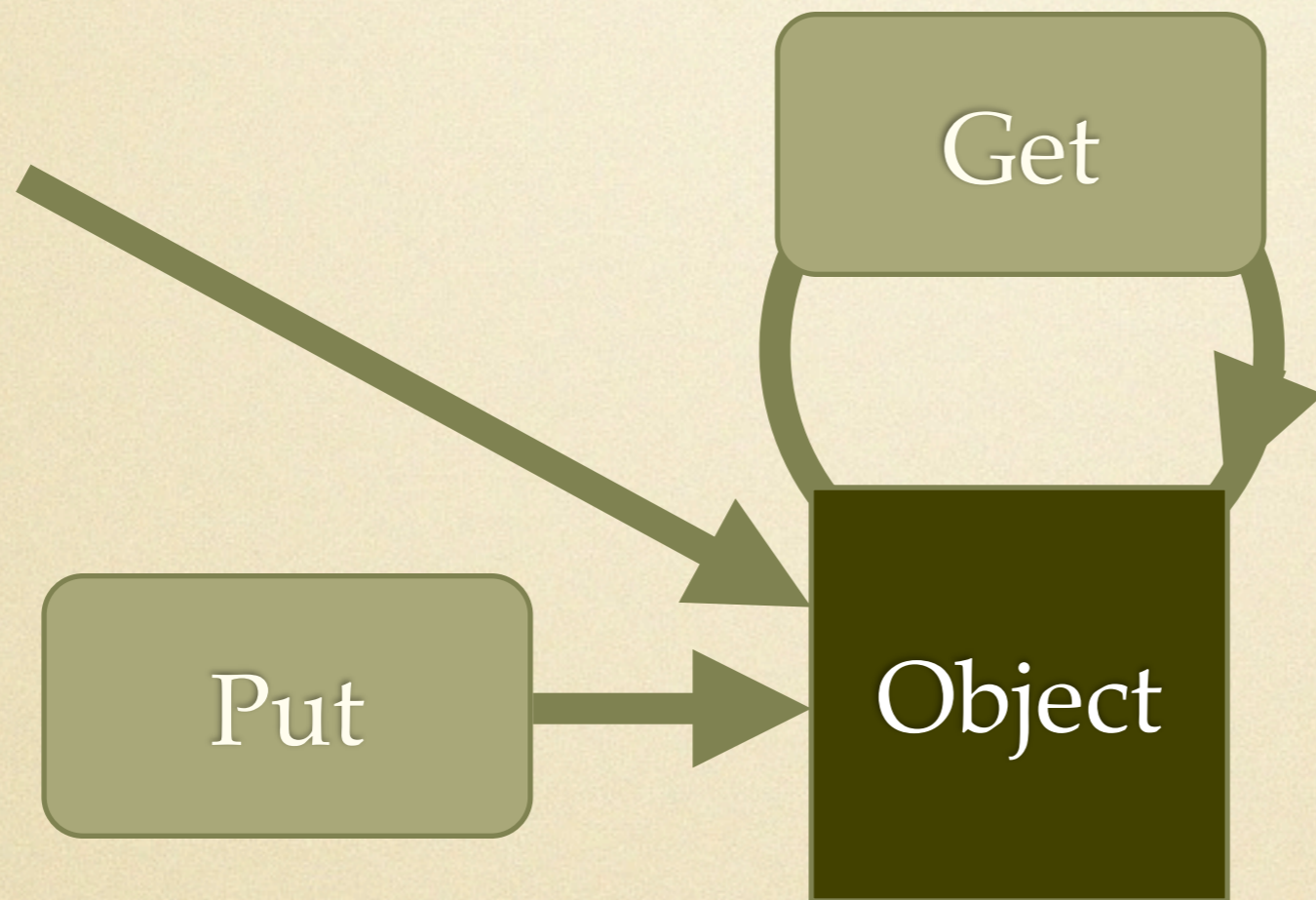
Top Left Quadrant
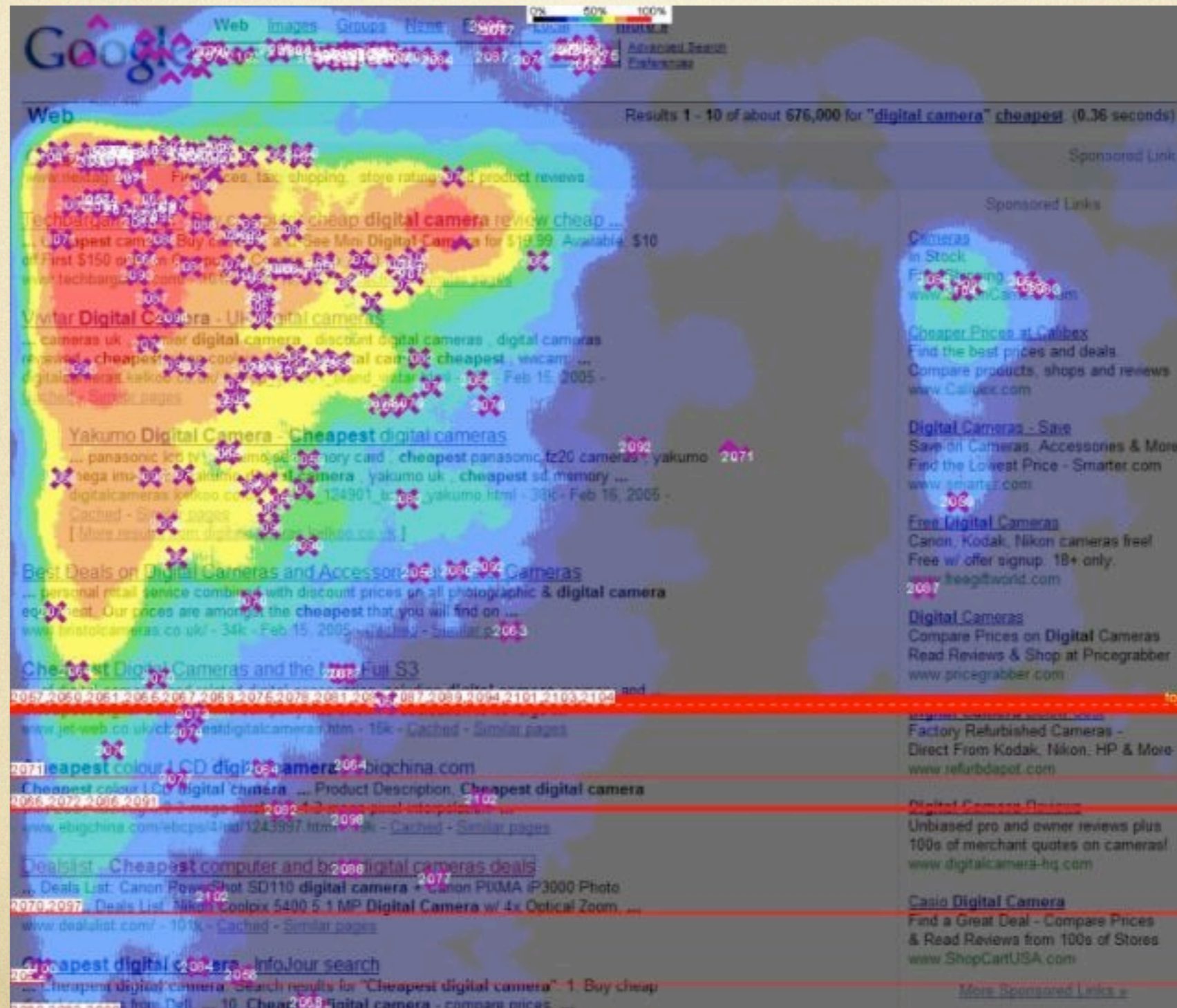
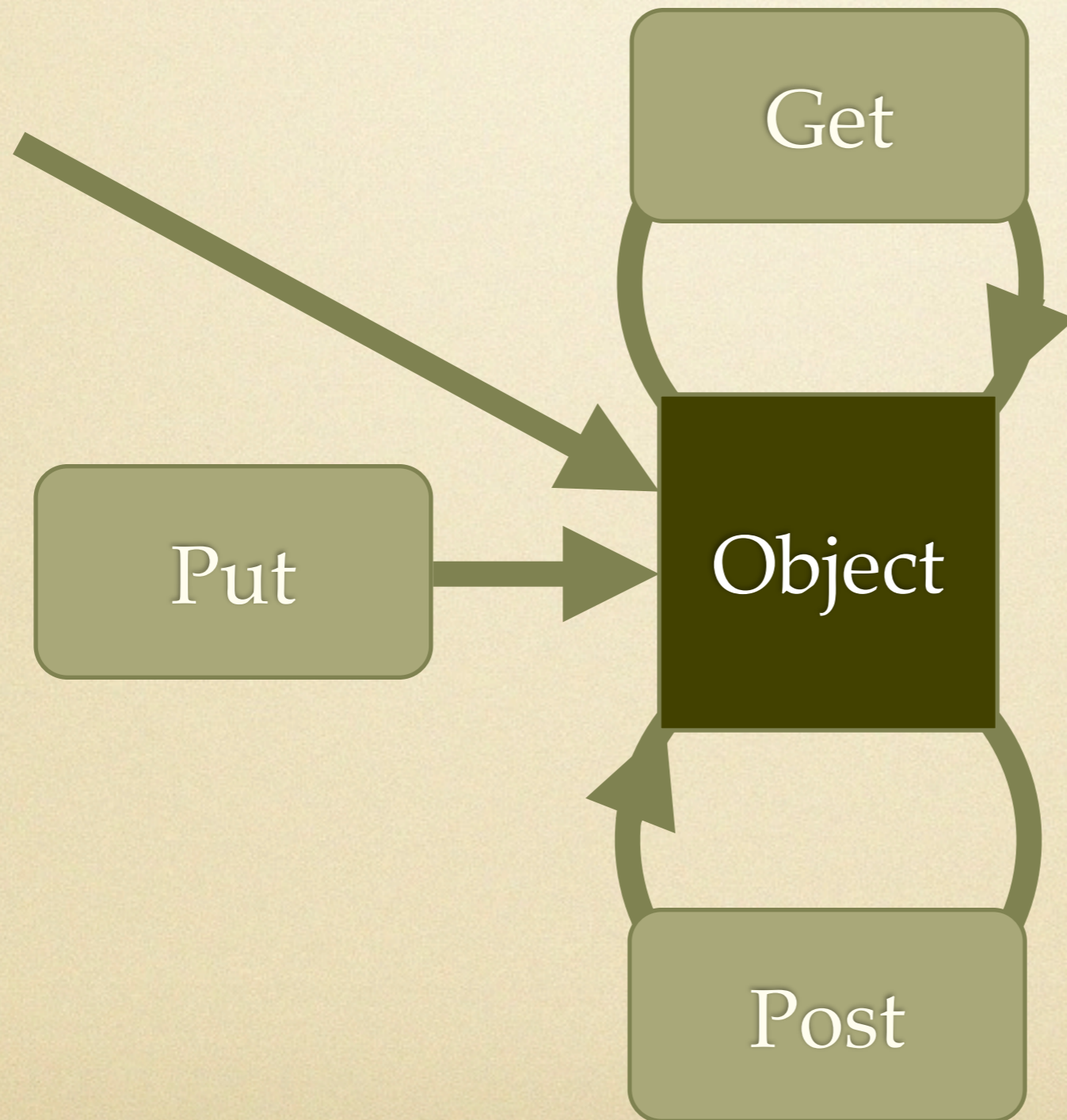# RESTful Lifecycle

RESTful Lifecycle

Put

RESTful Lifecycle
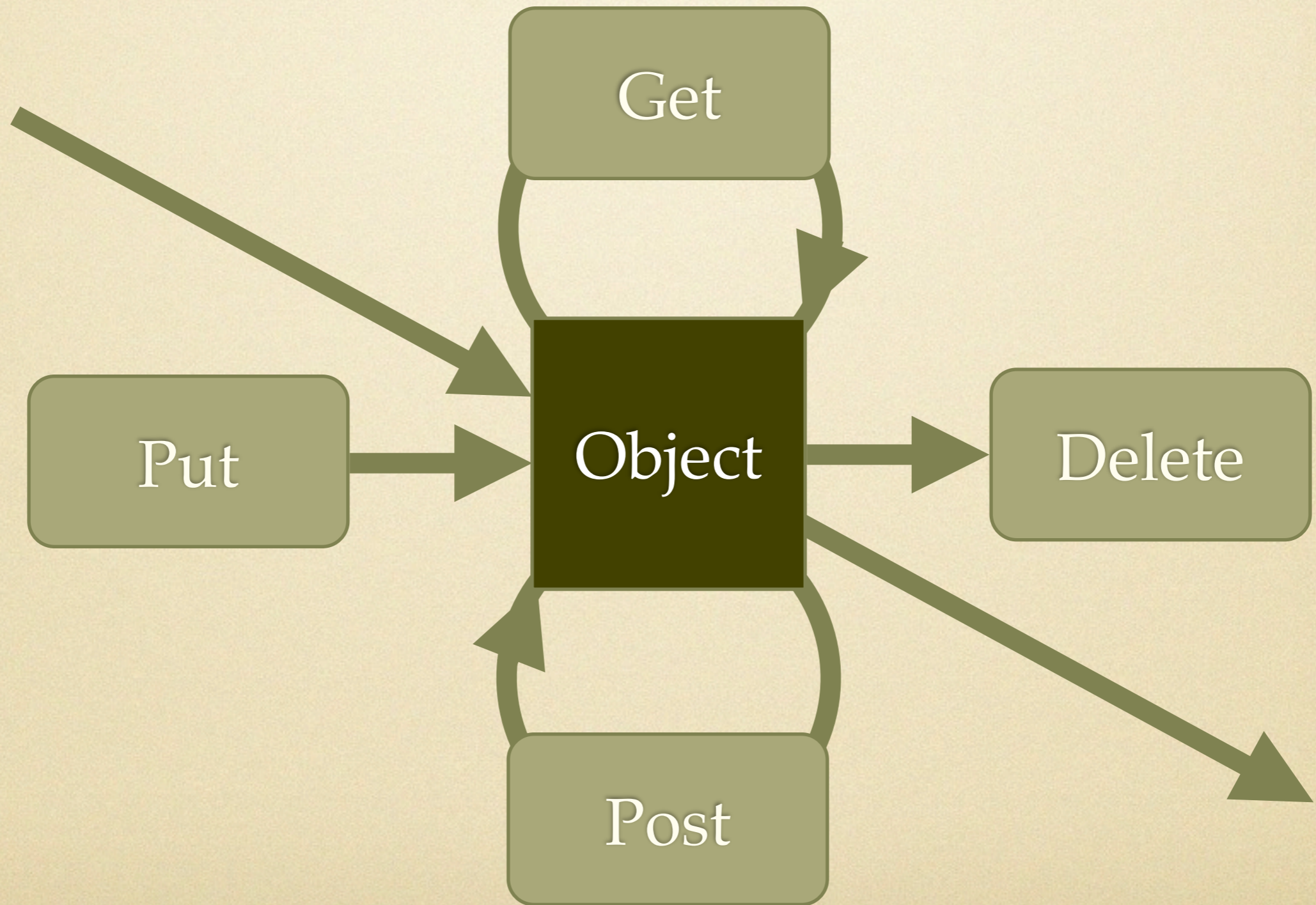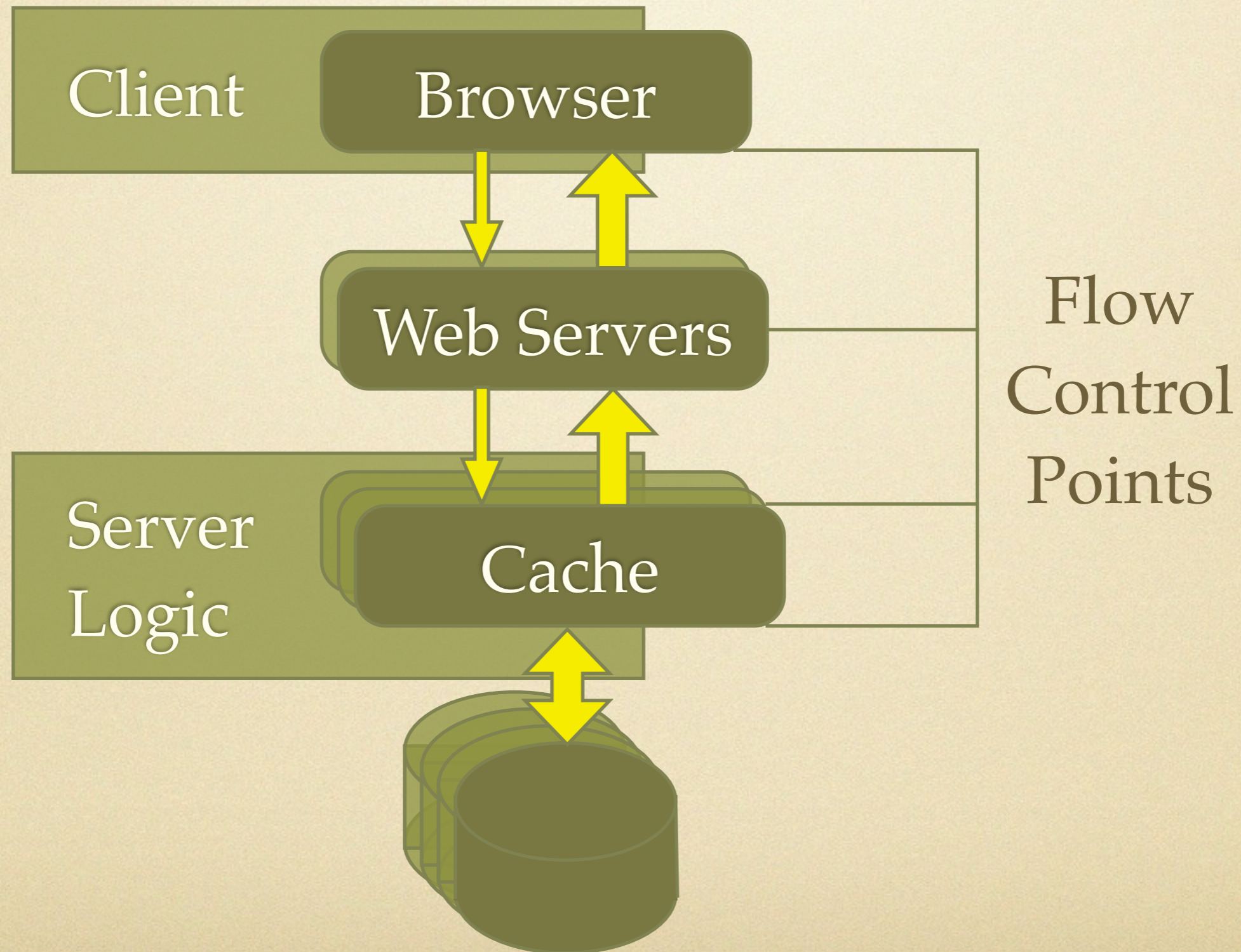
Put → Object

RESTful Lifecycle

RESTful Lifecycle

RESTful Lifecycle

RESTful Data Path

GWT

- First complete rich client platform

  - End to End coding in a single language

  - Good dev., testing, maintenance cycles

  - Google Wave implementation proof point

Worth Checking Out

- Powerful Javascript

  - http://www.chromeexperiments.com/

- Startup Metrics for Pirates

  - http://www.slideshare.net/dmc500hats/startup-metrics-for-pirates-sf-jan-2010

Q & A Topics

- Transparency in Browser & Client systems

- User driven development cycles

- Other development models