

Scalable Web Programming

CS193S - Jan Jannink - 1/19/10

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**

Internet Ecosystem

- * Created for universal information dissemination
- * Websites and pages as evolving species
 - * window into ongoing development of the web
- * Pages integrate via visits, in-links, search ranking
- * Google is symbiotic to the web as a whole
 - * contributing organically to each others growth

Evolution of the Web

- * Informational (early 90's)
- * Transactional (late 90's)
- * Community (2000's)
- * Mobile/Real time (now)
 - * reach for the browser when stuck in traffic
- * Pop culture mirror and amplifier

I Can Haz Meemz



Your Biggest Fan

- * Traffic drivers
 - * word of mouth
 - * influencers, aggregators
 - * marketing, SEO
- * Pagerank estimates traffic driven by links
- * Retweeting API allows influence measurement

Continued Web Growth

- * Mashups
 - * AJAX, site widgetization
- * Desktop convergence
 - * netbooks, browser/javascript performance
- * Mobile
 - * real time data, augmented reality

Tagline Overload

- * Information spread rate on the web
 - * search engine rank
 - * sharability, tweetability, memorability
- * Lure
 - * appeal to consumer desire

Obsessive Loop

- * Visitor retention and activity
 - * features geared to acquire and keep members
- * Hook
 - * addictive aspect to successful design
- * Most sites try to maximize single visit length
 - * best companies maximize (visits * length)

Attention Marketplace

- * Web measurement sites' self fulfilling prophecy
 - * capital = users * visits
- * General trends
 - * appeal to who we are, not who we aspire to be
 - * game-like activity enhances adoption
 - * ubiquity means people leave if you don't have it

Preconditions for Scale

- * Critical mass
 - * what gets attention
- * Feedback loop
 - * what keeps & builds attention
- * Available niche / competitive advantage
 - * takeover opportunity

Real World Parallels

- ✱ Evolutionary past
 - ✱ Cambrian explosion
- ✱ Economic development
 - ✱ post Mao China
 - ✱ post WWII Japan

Seibu Example

- * Employee of this Japanese conglomerate might:
 - * Live in a Seibu home
 - * Commute on a Seibu train
 - * Work in a Seibu office
 - * Shop in a Seibu Department store
 - * Catch a Seibu Lions game
 - * Vacation at a Prince Hotel

Back to Software

- * Information dissemination guides design
- * User behavior model defines features
 - * maximize initial user engagement
 - * facilitate increase of engagement
- * Release process functions as niche takeover

Additive Features

- * Openness, Freeness
- * Linkability
 - * e.g. linkback in blogs, email & embed codes
- * Embedding
- * Composition
 - * enabling the creation of something new

What Rarely Grows

- * Privacy, exclusivity
- * DRM, data lock-in
- * Lack of universality
- * “Swiss army knives”
- * Invite-only systems
- * Inferior signup code

Mashup APIs

- * Google Maps
- * Yahoo Search
- * Facebook Connect
- * Twitter
- * Flickr, YouTube, etc.

API Types

- * Client-side
 - * use JSNI with GWT
- * Proxy-style (Server-side)
 - * request, parse, republish 3rd party content
- * RESTful web services
 - * AWS S3

Scale Out Ideas

- * Make website crawler & search engine friendly
- * Amazon S3 for media storage
 - * add CloudFront CDN support as service grows
 - * keep media latency low
- * Twitter API gets the word out
- * Facebook Connect [open social] grow user bases

Worth Checking Out

- * Amazon S3

- * <http://aws.amazon.com/s3/>

- * Made to Stick, Chip & Dan Heath

- * Alexa, Compete, Quantcast

Q & A Topics

- * Getting test code to run in app
- * Upcoming programming project teams
 - * no leaders per se, but project advocates
- * Project planning
 - * now's the time to advertise!

Project ideas

- * Degree Requirements checker
- * Specification / Document claim verifier
- * Wikipedia / Twitter mapper
- * Web based Eclipse IDE
- *
- *