

All About Platform

차세대 웹기술과 컨버전스

Lecture 4

수업블로그: <http://itmedia.kaist.ac.kr>

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<http://www.web2hub.com>

Platform: Overview

What is Web 2.0?

참여

Web as Platform

공유

개방

What is Platform?

- **Webster Online Dictionary**

- 3. The combination of a particular computer and a particular operating system

- **Wikipedia** (http://en.wikipedia.org/wiki/Platform_%28computing%29)

- In computing, a platform describes **some sort of framework**, either in hardware or software, which **allows software to run**. Typical platforms include a computer's architecture, operating system, or programming languages and their runtime libraries

- **Tim O'Reilly** (<http://www.oreillynet.com/pub/wlg/5630>)

- I'm talking about the emergence of what I've started to call Web 2.0, the internet as platform... It's about the way that **open source and the open standards of the web** are commoditizing many categories of infrastructure software, driving value instead to the data and business processes layered on top of (or within) that software; it's about the way that web sites like eBay, Amazon, and Google are becoming **platforms** with **rich add-on developer communities**; it's about the way that **network effects and data**, rather than software APIs, are the new tools of customer lock-in...

Platform = 멍석



+



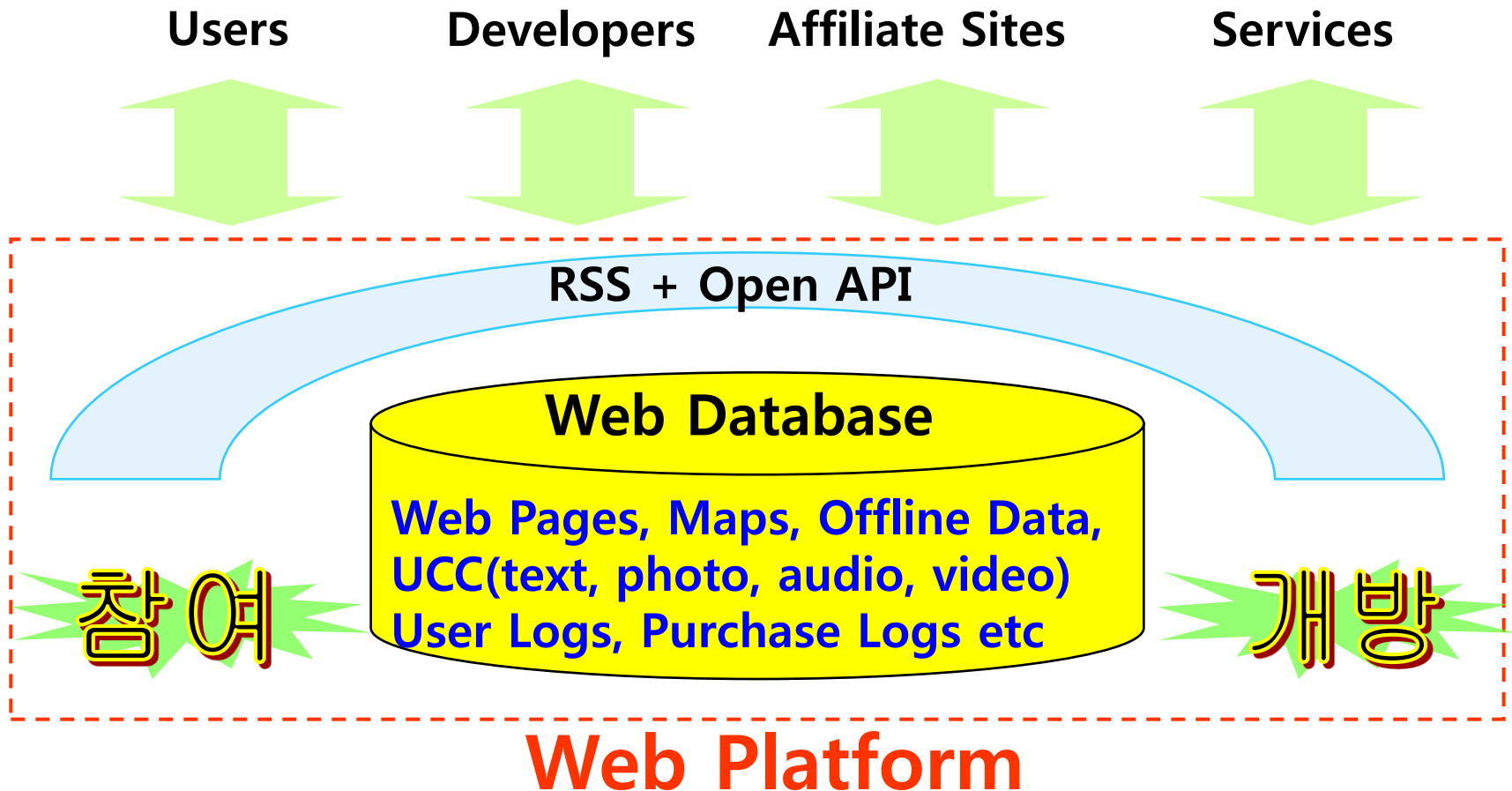
Source:
Web 2.0 : Participation and Open
by Dr. JoongHee Ryu

My Definition on Platform

Platform

그 자체가 최종 결과물이 아니라
Service나 S/W가 만들어지는
재료나 환경을 제공하는 것

Web as Platform



Environment where services are developed, deployed, and executed based on [massive Web DB](#)

Platform Battle

(“What is Web 2.0?, Tim O’Reilly)

- **In PC era, Battle between platform and application**
 - Windows platform vs. applications → **platform win!**
Lotus 1-2-3 vs. Excel, WordPerfect vs. Word, Netscape Navigator vs. Internet Explorer
- **In Internet era, Battle between two platforms**
 - Windows platform vs. Web platform
 - Windows Platform : massive installed base and tightly integrated operating system and APIs → control over programming
 - Web 2.0 Platform : a system without an owner, tied together by a set of protocols, open standards and agreements for cooperation
 - Communication-oriented systems require interoperability
→ Unless a vendor **can control both ends of every interaction**, the possibilities of user lock-in via software APIs are limited

eBay Platform

E-Commerce Platform

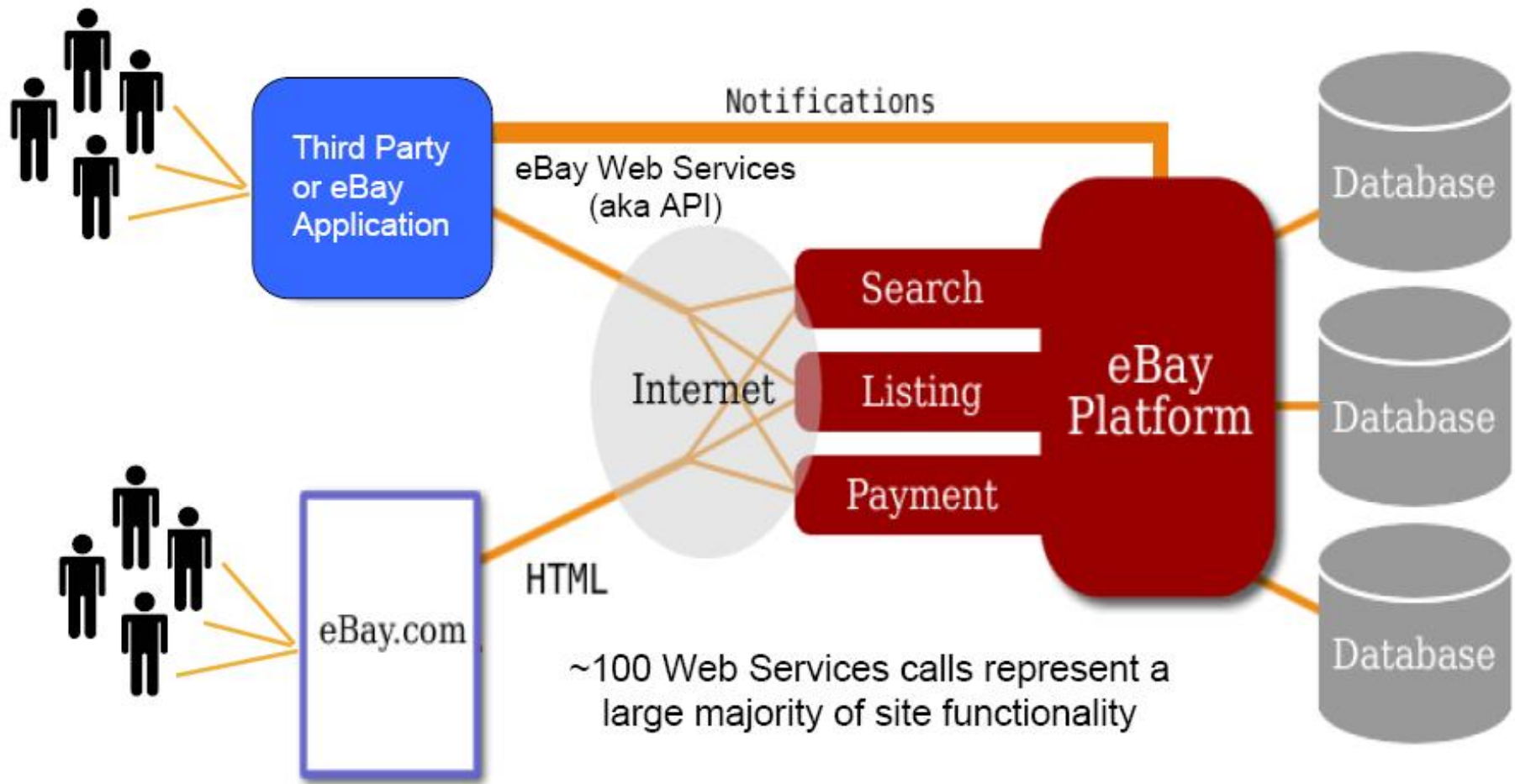
eBay Business Platform

Business and Solution Partner

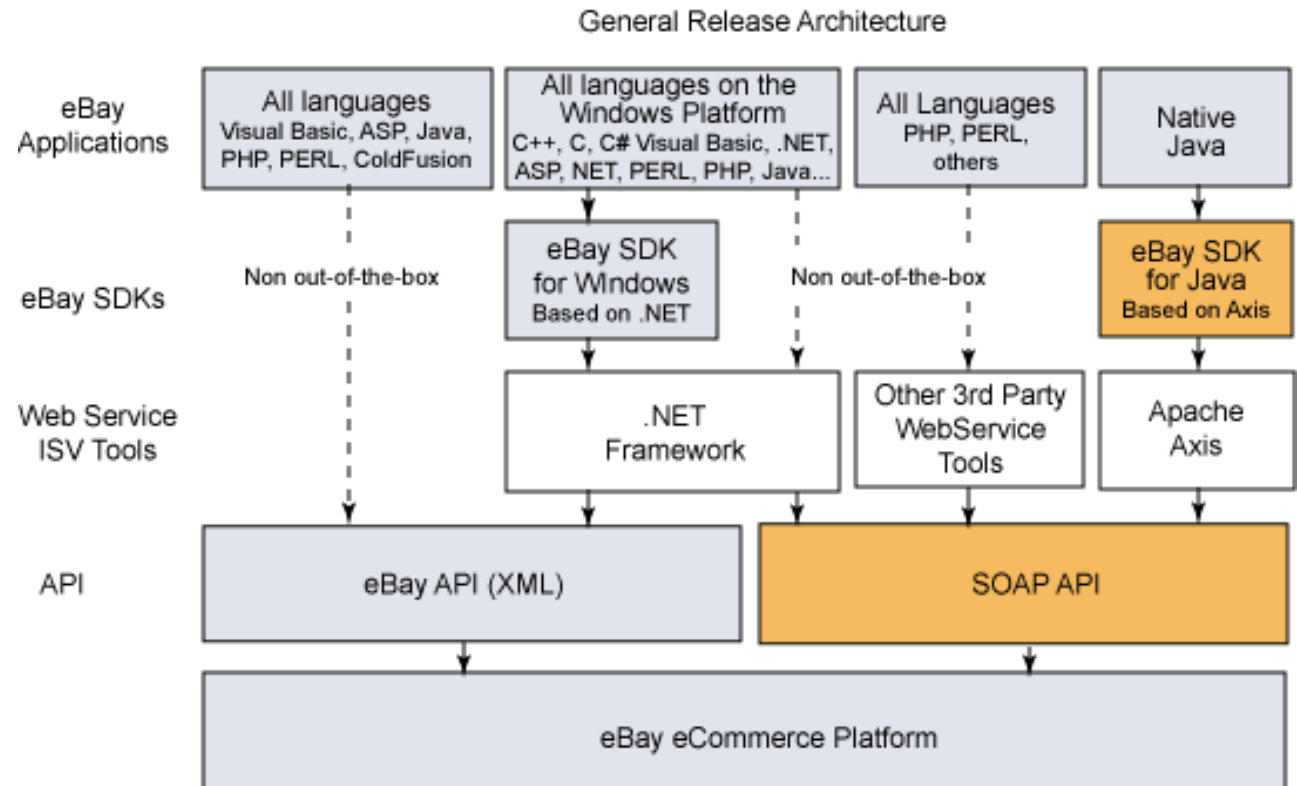
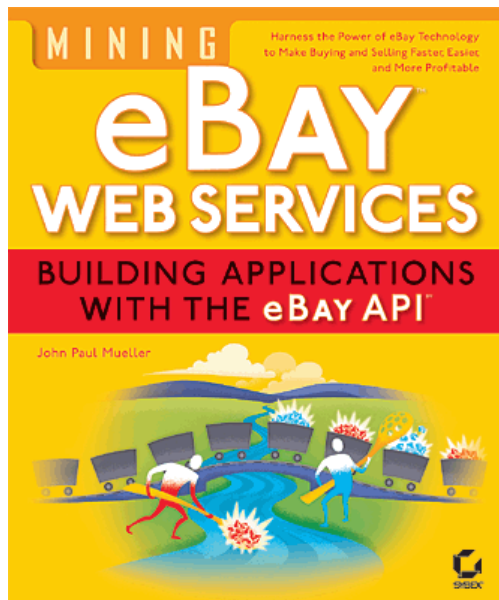
- 45% of auction items are exposed to partner sites through API
- Over 5.7 billion API requests every month
- 30,000 registered external developers who make services and tools for eBay
- the number of customers using these services and tools increase at the rate of 45% every year



eBay Technology Platform









eBay Web Services Architecture



Source: IBM

eBay Web Services Features

- Search
- Listing Items
- Transaction/Order Management
- My eBay
- eBay Stores
- Feedback Management
- Watch List

Items I'm Watching (10 items) Print Customize Disp						
Show: All Active (1) Ended (9)						
<input type="button" value="Delete"/> <input type="button" value="Compare"/> <input type="button" value="Email To A Friend"/> <input type="button" value="Add Note"/>						
<input type="checkbox"/>	Picture	Current Price	Shipping Cost	Bids	Seller ID	Time Left Action
<input type="checkbox"/>		2004 Lamborghini Murcielago E-gear AUTHORIZED DEALER! (Lamborghini) (Reserve Not Met)	\$160,300.00	See description	14 siliconvalleyautogroup (0)	3h 19m <input type="button" value="Bid Now!"/>
<input type="checkbox"/>		BMW M6 Coupe - Build Your Own - April Delivery - NEW!!! (BMW : M-Series)	\$2,567.00	See description	9 fashionsupervixen (254 ★)	Ended View Seller's Other Items
<input type="checkbox"/>		Microsoft Xbox 360 PREMIUM-new and sealed w/ receipt!!	\$510.00	\$35.00	12 soriano2k4 (46 ★)	Ended View Seller's Other Items
<input type="checkbox"/>		NEW Microsoft XBOX 360 Premium Bundle Xbox360 Platinum	\$465.00	\$40.00	21 mha188 (30 ★)	Ended View Seller's Other Items
<input type="checkbox"/>		DIRECTV HR10-250 HD DVR 200 HOURS OF TV RECORDING!	\$229.05	See description	26 oceansno.1 (24966 ★)	Ended Visit Seller's Store
<input type="checkbox"/>		SEALED NEW APPLE IPOD NANO 2 GB MP3 BLACK COLOR LCD 3GB				

- In short, almost everything you can do through the eBay website

Google Platform

Ads Platform

Web Marketplace



Google AdWords

The screenshot shows a Google search for 'chocolates'. The search bar contains 'chocolates' and the search button is labeled 'Search'. Below the search bar, there are navigation links for 'Web', 'Images', 'Video', 'News', 'Maps', 'Desktop', 'Moma', and 'more »'. The search results are displayed under the heading 'Web' and show 'Results 1 - 10 of about 29,200,000 for chocolates [definition]. (0.19 seconds)'. The results are divided into two columns. The left column contains three organic search results, and the right column contains three sponsored links. The sponsored links are highlighted with red boxes.

Web Results 1 - 10 of about 29,200,000 for chocolates [definition]. (0.19 seconds)

Sponsored Links

[Chocolate Gift](#)
www.HersheyGifts.com Find HERSHEY'S Gifts For Every Occasion. Gifts Starting From \$15!

[Chocolate at 1800FLOWERS](#)
1800flowers.com Shop 1-800 FLOWERS for Valentine's Roses, Flowers, Chocolates & More!

[Chocolate and Truffle Gifts from Godiva: Home](#)
Chocolate Recipes and Shopping online presented by Godiva Chocolatier.
www.godiva.com/ - 37k - [Cached](#) - [Similar pages](#) - [Note this](#)

[Chocolate, Chocolate Gifts, Gourmet Chocolate, Chocolate Truffles ...](#)
Buy **Chocolate** HERE! Gifts, Truffles, and Boxes of **Chocolate** - Handmade and Artisan Specialties.
www.chocolate.com/ - 19k - [Cached](#) - [Similar pages](#) - [Note this](#)

Sponsored Links

[FTD® Official Site](#)
Chocolate Gifts
Same Day Delivery. Save Online!
www.FTD.com

[Sweet Sensations](#)
Chocolate Valentine gifts from
Master Chocolatier Joseph Schmidt
www.josephschmidtconfections.com

[Chocolate Gifts](#)
Gourmet **Chocolates**, Candies & more
Find Gifts for Every Occasion!
www.RedEnvelope.com

- **Targeted Advertising**
- **Pricing Models**
 - Keyword-targeted: CPC (cost-per-click)
 - Site-targeted: CPM (cost-per-thousand impressions)
- **Auction-based determination of ad position**
 - Ad Rank = Maximum CPC X Quality Score

Google AdSense

The screenshot shows the Apartment Ratings website interface. At the top, there's a navigation bar with 'My Account | About Us | Contact Us' and a search bar for 'Search by Apartment Name' with fields for 'City:' and 'State:' and a 'GO' button. Below the navigation bar are three tabs: 'RATINGS & REVIEWS', 'MOVING CENTER', and 'FREE LOCATOR'. The main content area is divided into several sections:

- Find and rate apartments nationwide:** Includes search boxes for 'by zip:' and 'by state:' with 'GO' buttons.
- Map of the United States:** A map showing state boundaries, with a list of state abbreviations (NH, VT, MA, RI, CT, NJ, DE, MD, DC) to its right.
- Welcome to ApartmentRatings.com:** A section with a heading and a paragraph: 'The most comprehensive database of apartment ratings and reviews anywhere! Find out what tenants say BEFORE you sign a lease.' It includes a bulleted list:
 - **The most reviews!** 482,977 ratings and reviews of apartments nationwide.
 - What the Neighbors Pay
 - Oh My Apartment a blog to help renters live better
- Already know the apartment name?:** Includes search boxes for 'Apartment:', 'City:', and 'State:' with a 'GO' button.
- Read ApartmentRatings.com Success Stories:** A link to success stories.
- Ads by Google:** A red-bordered box containing two ads:
 - Student Housing:** 'Free rental information at Rent.com Find student apartments & roommates www.Rent.com'
 - 6 Weeks Free Rent:** 'Huge Apts. Great Floorplans! Perfect Port Orchard Location! www.udrt.com'

- **Context ads in web pages**
 - Text or image ads
 - Profit sharing with publishers
- **Expanding ad publishers to long tail**
- **New profit model for SMB sites**

Google's Competitors

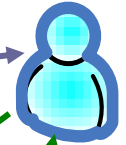
- Google의 수입원 99% → 광고
- 만약 사용자들이 광고를 통하지 않고 쇼핑을 한다면?
→ eBay, Amazon, Yahoo 등이 제공해 주는 one-stop shopping
- 대응전략
Google과 Google의 광고 네트워크 사이트들을 하나의 거대한 e-Marketplace로 만들자.

Google Ads Platform

대형 쇼핑몰
(Walled Garden)



쇼핑&구매



쇼핑(검색)

구매

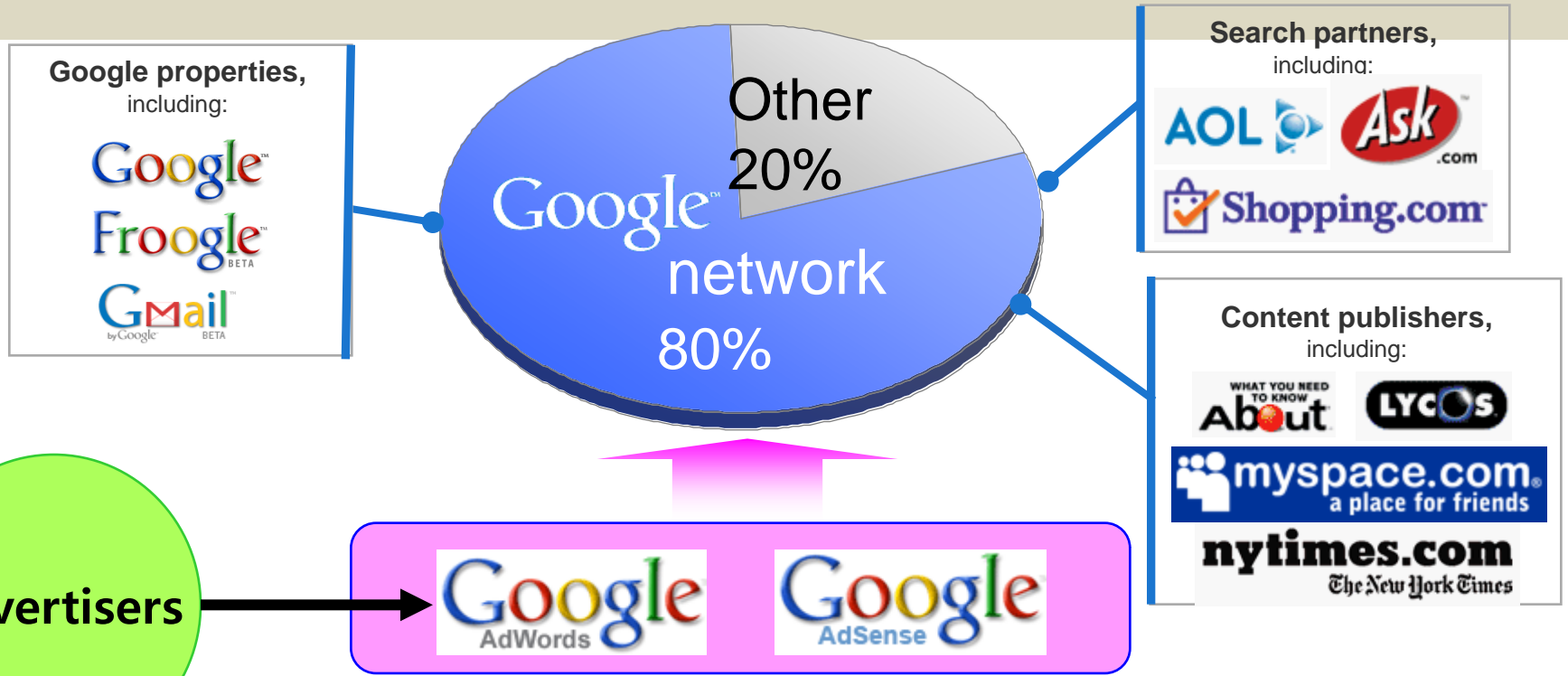


중소 쇼핑몰
& 생산자

AdWords	CPC/CPM	Google Sites
AdSense	CPC/CPM	Contents Network
AdSense	CPA	Content Referral Network
모든 형태의 광고모델 구비		

Google Ad Distribution Network
(Open Platform)

Google Ad Network



Extending ad type and ad network



Blog
 (\$?)



Radio
 (\$102 million)



Video
 (\$1.65 billion)



Game
 (\$23 million)



Display Ad
 (\$3.1 billion)



RSS
 (\$100 million)

Online Ads Market

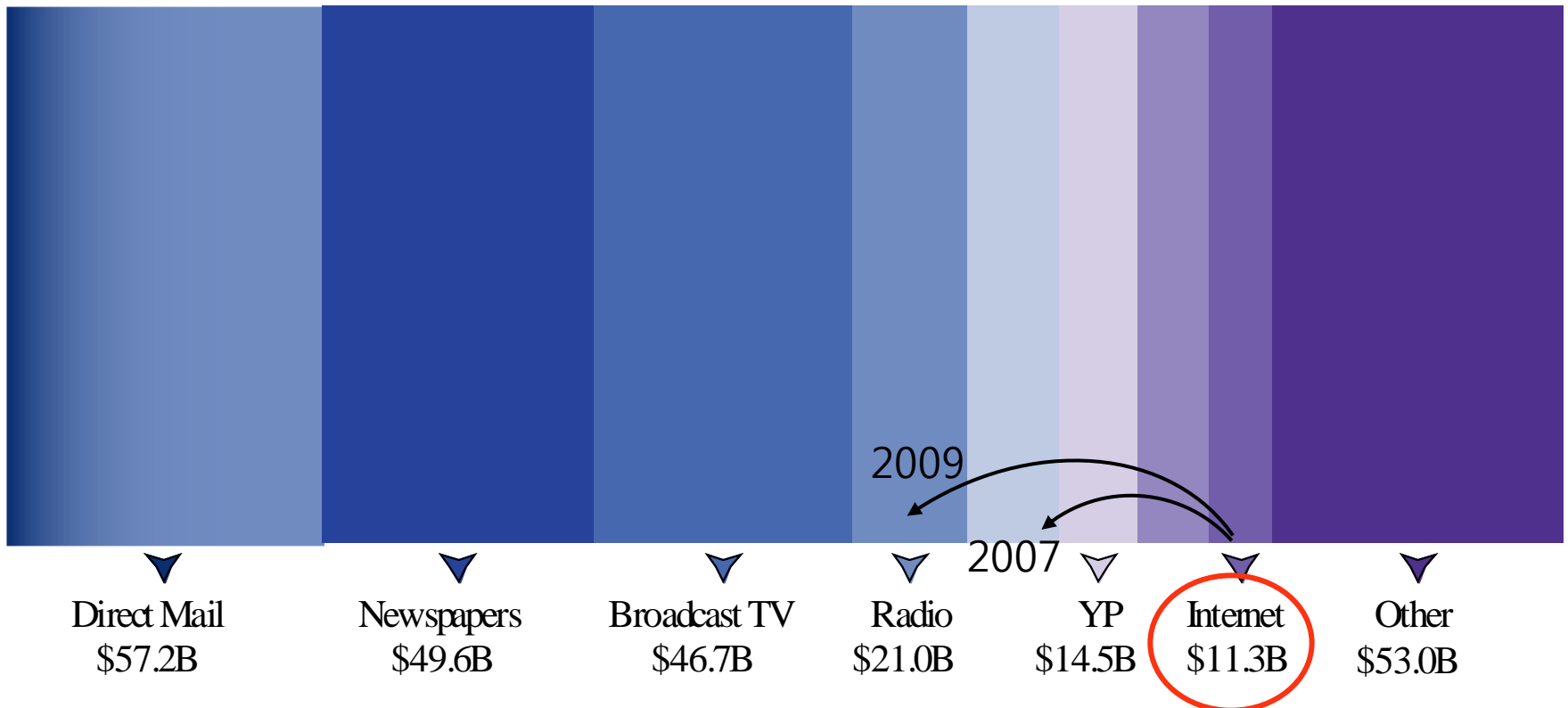
Source: 2006 Google Analyst Day Presentation

\$283B

\$11.3B중에 \$4B정도가 검색광고, 이중 Google이 79% 차지
(전체 US 온라인 광고의 27%, 전체 US 광고의 1%)

Cable TV
\$16.7B

Mags
\$13.0B



Source: Universal McCann (December 2005)

Note: "Other" includes outdoor, product placement, satellite radio, movie trailers, video games, specialty marketing, etc.

Google's Crisis?



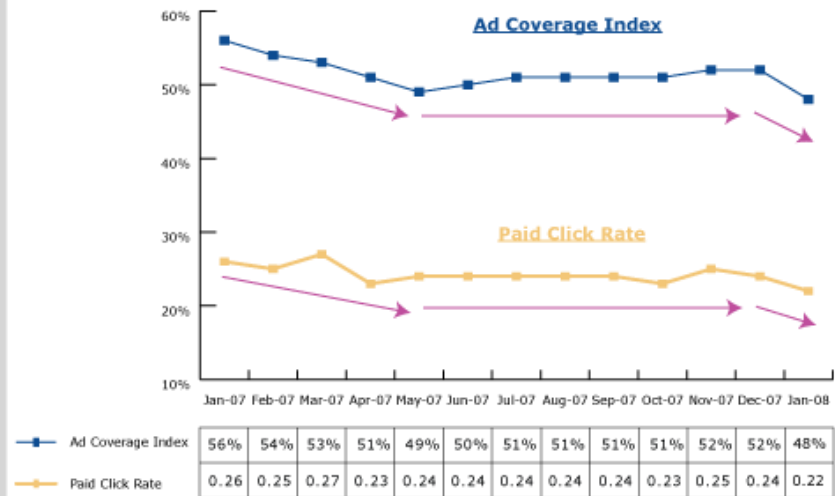
Figure 2

Sequential Change in Paid Click Rates

	Dec-07	Jan-08	% Chg
Google	0.24	0.22	-8.1%
Other Engines	0.21	0.21	0.5%

Decrease of Paid Click Rate (comScore Report)

Figure 1
Trends in Google's Search Ad Coverage and Paid Click Rates



Source: comScore, Inc.

comSCORE

<http://finance.google.com/finance?q=google>

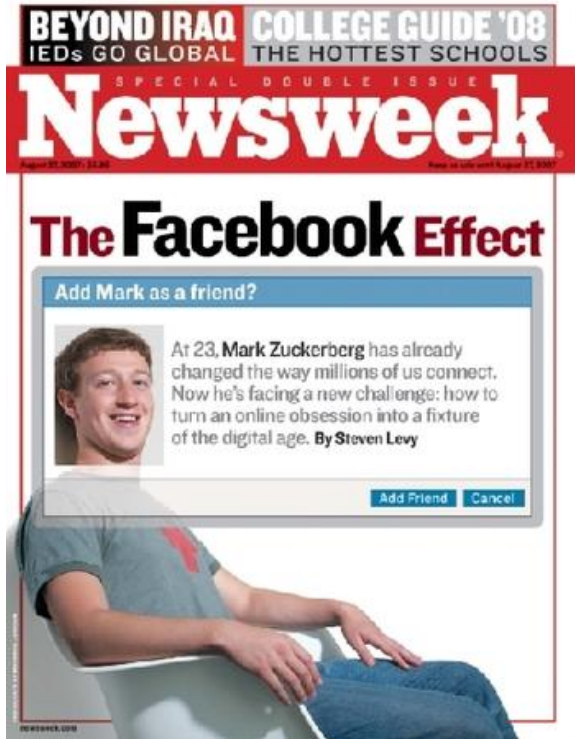
http://www.comscore.com/blog/2008/02/why_googles_surprising_paid_click_data_are_less_surprising.html

Facebook Platform

Social Platform

Facebook

- The fastest growing social network service
- Founder: Mark Zuckerberg (23 years old!)
- \$15 billion valuation in 3 years



Source: Sanku Jo's Presentation from Future Internet Conference 2008

Facebook Statistics (Jan 2008)

<http://www.facebook.com/press/info.php?statistics>

● User Statistics

- Active users: Over 67 million
- Daily new user average: 250,000
- Page views: Over 65 billion per month
- Searches: Over 500 million per month
- Traffic rank: 6th
- Photos: 1.7 billion (which averages to about 44 photos per user)
- Daily photo uploads: Over 14 million
- Social networks: Over 55,000

● Platform Statistics

- Applications: Over 15,000
- Daily new applications: 140
- More than 95% of Facebook members have used at least one application built on Facebook Platform

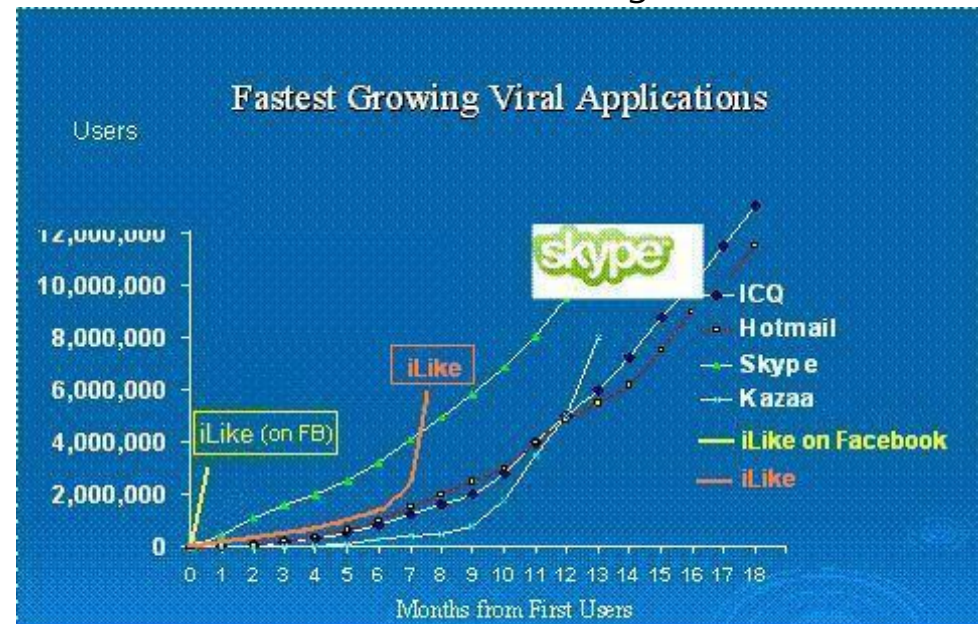
Facebook Platform

- **Launched in May 2007**
- **Framework for creating applications in Facebook**
 - **Deep Integration**: build applications like Facebook does
 - **Mass Distribution**: harness the power of the social graph
 - **New Opportunity**: build a business
- **Features**
 - Social Network Already Established
 - Immediate Install, Low Barrier to Entry
 - Built-In Viral Potential
 - Multiple Funding Programs Available (fbFund)
 - Free Hosting Opportunities from Joyent
 - **Facebook-dependent** technologies
 - Client APIs, FQL (Facebook Query Language), FBML (FaceBook Markup Lanuage)

Success Story: iLike

- **iLike (www.ilike.com)**
 - Social music service
 - Fast growth of users
 - One million users in the first week
 - A million more in the 5 days
 - Another million in the next 4 days
 - Currently 15 million users
 - About 300,000 new users per day
 - Grow faster than skype, ICQ ,etc

(from iLike blog)



Data from Tim Draper presentation on Viral Distribution

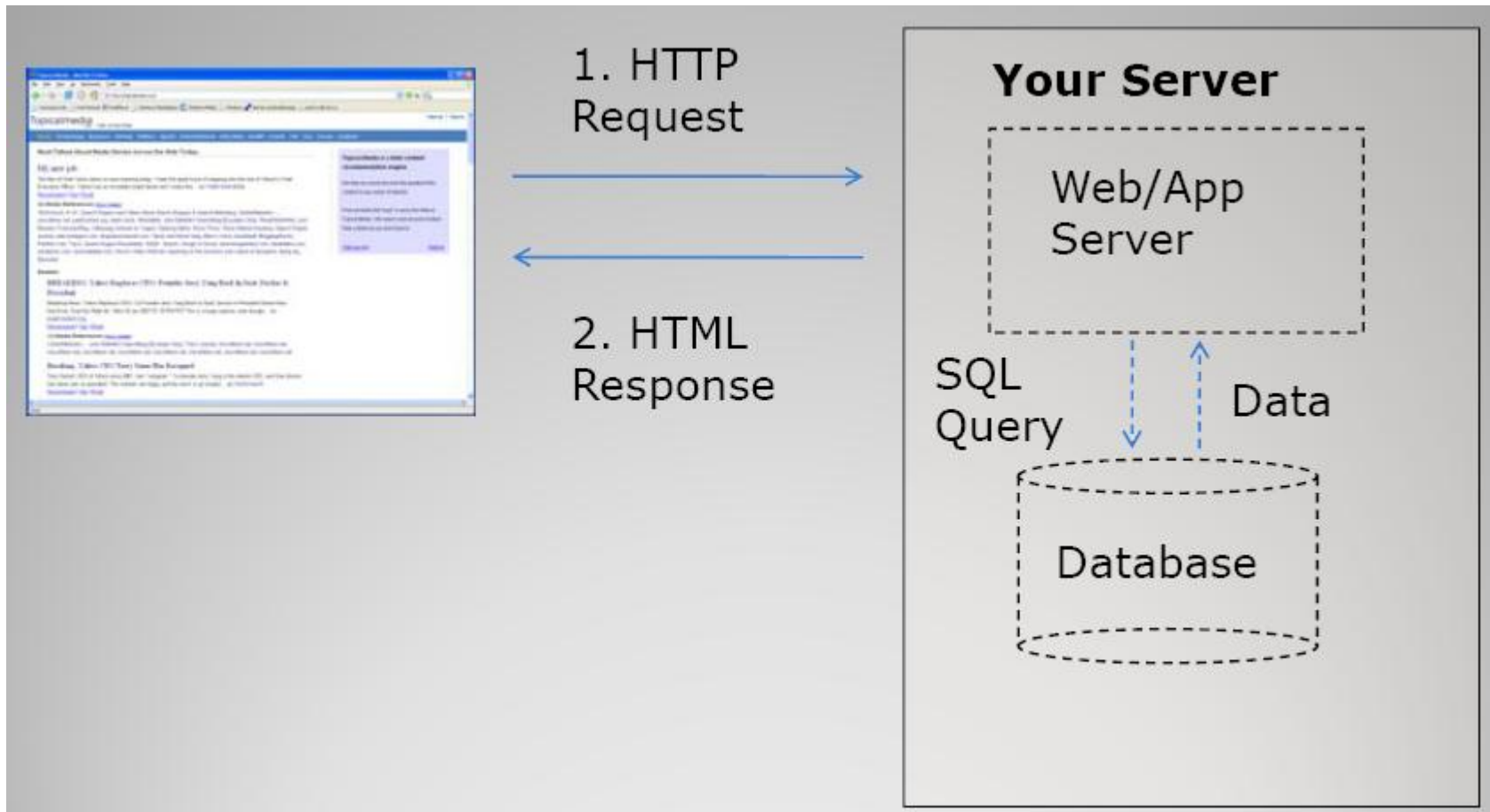
Structured Page

The image shows a screenshot of a Facebook profile page for David Zhuang, viewed in a Mozilla Firefox browser. The page is annotated with four red dashed boxes and arrows pointing to them from labels on the right side:

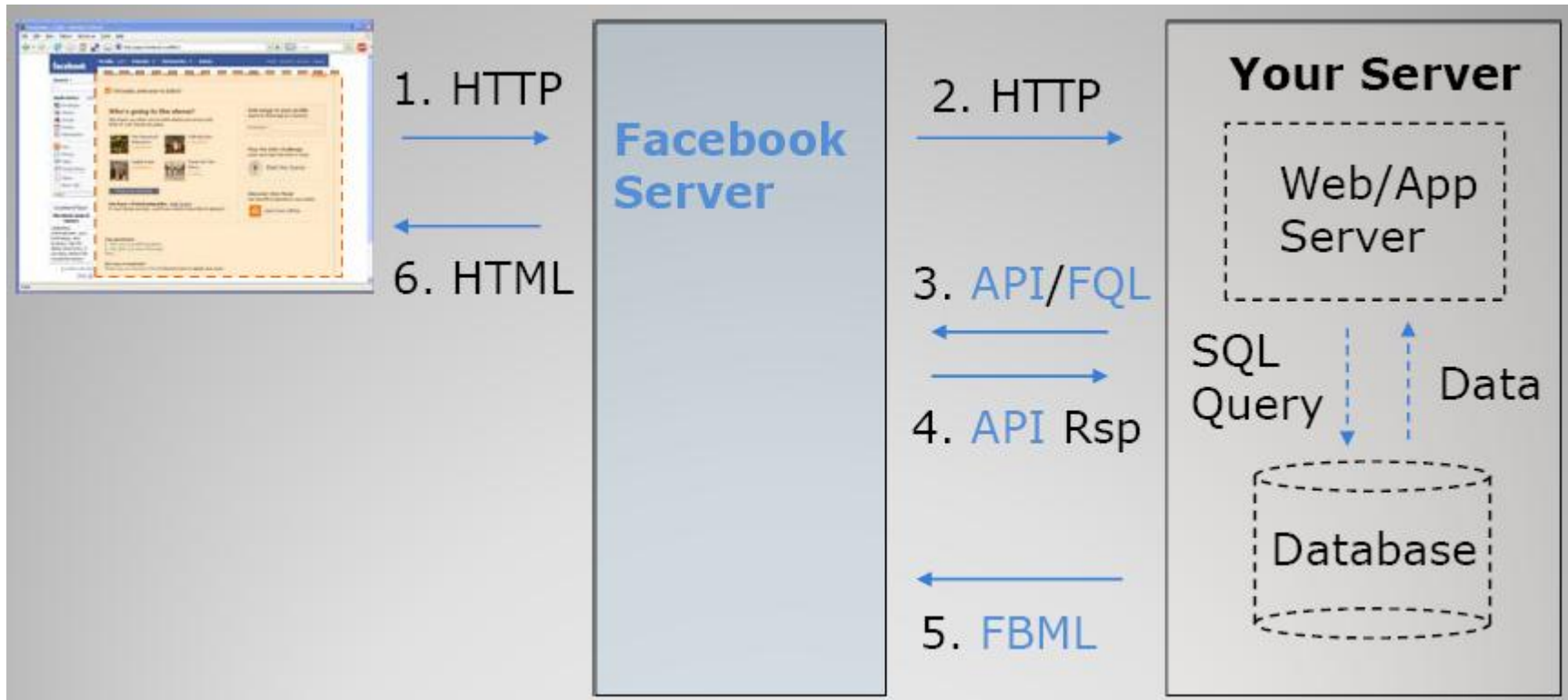
- Left Nav:** Points to the left-hand navigation menu containing sections like Applications, Like, Video, and News Talk.
- Canvas:** Points to the main content area of the profile, which includes the profile picture placeholder, status update area, and various modules like Mini-Feed and Like.
- News Feed:** Points to the 'Mini-Feed' section, which displays a list of recent updates from friends.
- Profile Box:** Points to the 'Like' module, which is a widget for interacting with the profile's content.

The browser window title is "Facebook | David Zhuang - Mozilla Firefox". The address bar shows the URL: http://stanford.facebook.com/profile.php?id=2182908/fb_from_app_id=255816. The browser's menu bar includes File, Edit, View, History, delicious, Tools, and Help. The browser's toolbar shows navigation buttons, a search bar with "Google", and a tab labeled "ABP".

Traditional Web Application Arch.



Facebook Web Application Arch.



Platform Components

● API

- Web Service API
- Client Library
 - Official: PHP, Java
 - Unofficial: Perl, Python, Ruby, VB.NET, and others

● FQL (Facebook Query Language)

- Similar to SQL
- Access to user profile, friend, group, event, and photo

Example of FQL & API

```
$query = "SELECT name FROM group WHERE gid IN  
        (SELECT gid FROM group_member WHERE uid= u1)";  
$array = $facebook->api_client->fql_query($query);
```

Platform Components

● FBML (Facebook Markup Language)

- Similar to HTML
- Subset of HTML + Proprietary Extensions

Example of FBML

Preview



```
<fb:dashboard>  
  <fb:action href="new.php">Create a new photo album</fb:action>  
  <fb:action href="you.php">Photos of You</fb:action>  
</fb:dashboard>
```

Facebook Ad Models

<http://www.facebook.com/business/>

Pages



Social Ads



Beacon



Insights



 **Meagan Marks** gave a 4-star rating to the movie **Top Gun**.
Sponsored

Blockbuster Total Access Online
Do you feel the need? The need for speed.
Rent online, exchange in-store today!

Meagan  ★★★★★

Amazon Platform

Web Service Platform

Amazon's Risky Bet



http://www.businessweek.com/magazine/content/06_46/b4009001.htm

Amazon Web Services

A set of APIs and business models which give developer-level access to Amazon's infrastructure and content:





Data As A Service

-  Amazon E-Commerce Service
-  Amazon Historical Pricing

Infrastructure As A Service

-  Amazon Simple Queue Service
-  Amazon Simple Storage Service
-  Amazon Elastic Compute Cloud
-  Amazon Simple DB

Search As A Service

-  Alexa Web Information Service
-  Alexa Top Sites
-  Alexa Site Thumbnail
-  Alexa Web Search Platform

People As A Service

-  Amazon Mechanical Turk

Issues Facing Developers

- **70% of Web Development Effort is “Muck”**

- Data Centers
- Bandwidth / Power / Cooling
- Operations
- Staffing

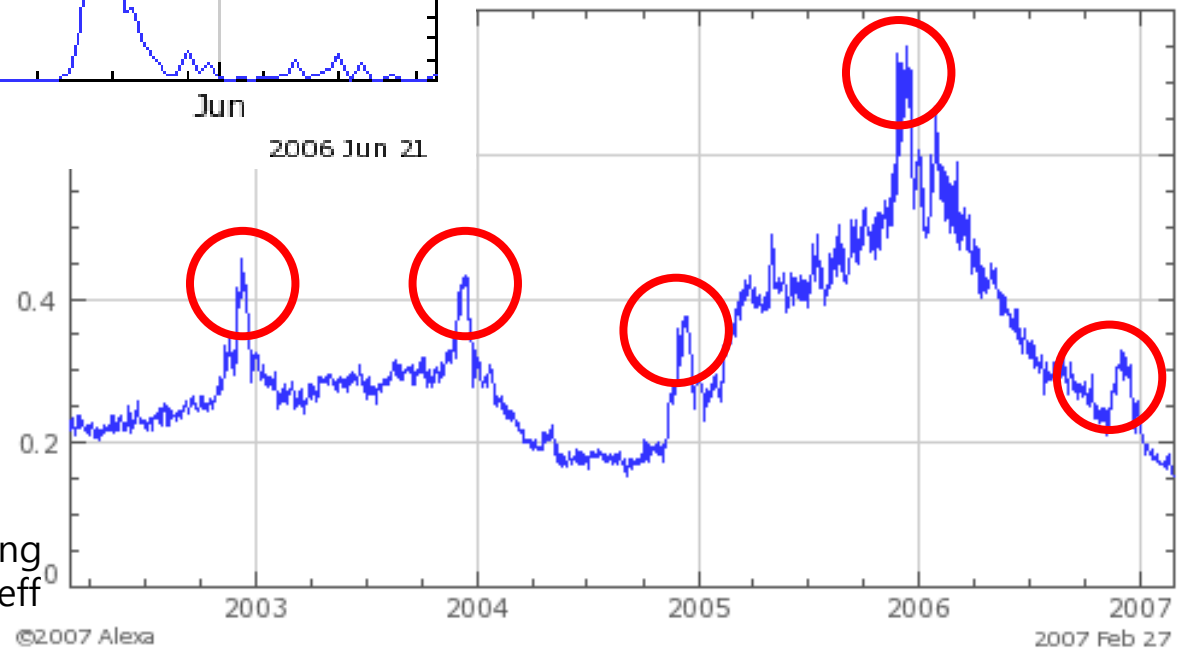
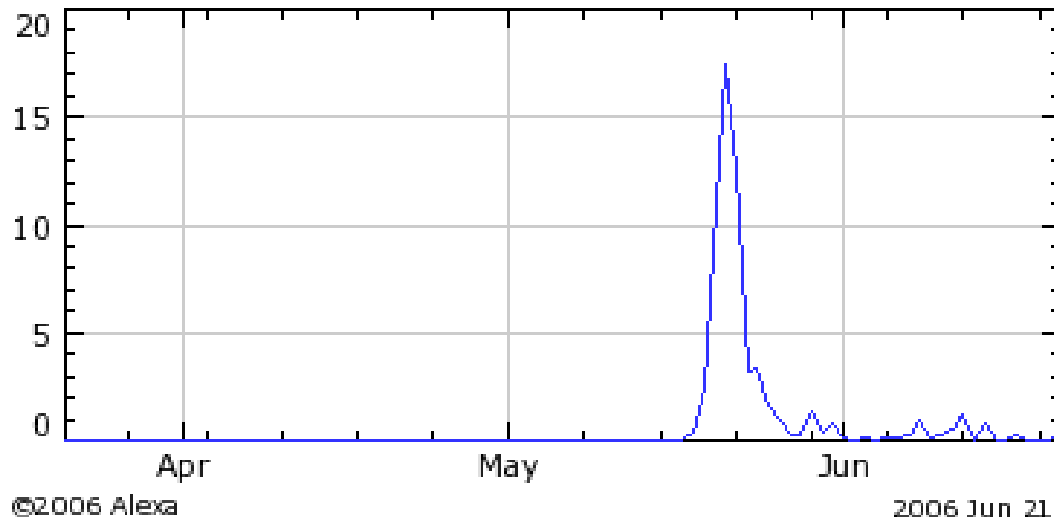
- **Scaling is Difficult and Expensive**

- Large Up-Front Investment
- Invest Ahead of Demand
- Load is Unpredictable

Source: Amazon Web Services: Building Highly Scalable Web Applications
– Jeff Barr, 2007

Slashdot/Digg/TechCrunch Effect

Daily Pageviews (per million)



Source: Amazon Web Services: Building Highly Scalable Web Applications – Jeff Barr, 2007

Solution: Web-Scale Computing

- **Scale capacity on demand**
- **Turn fixed costs into variable costs**
- **Always available**
- **Rock-solid reliability**
- **Simple APIs** and conceptual models
- **Cost-effective**
- **Reduced time to market**
- **Focus on product & core competencies**

Source: Amazon Web Services: Building Highly Scalable Web Applications
– Jeff Barr, 2007

Very Low Price!



S3

\$0.15 per
GB-Month



EC2

\$0.10 per
Instance-Hour



SimpleDB

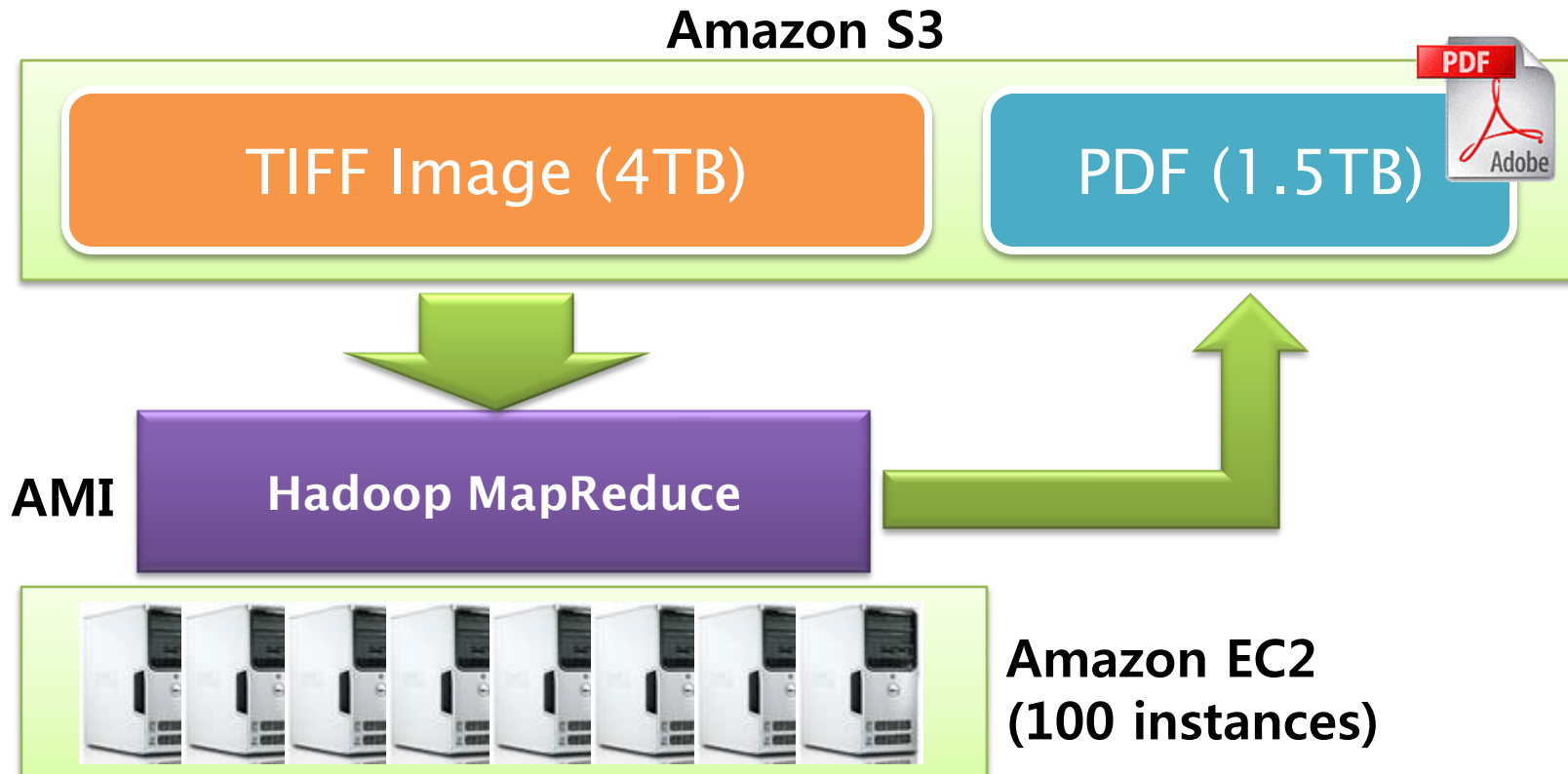
\$1.50 per
GB-Month

Case Study: New York Times

● Image Processing at New York Times

- Convert 11 million articles (1851-1980) of TIFF format into PDF
- Using **Amazon S3 and EC2** for HW, **Hadoop** for SW

Link: <http://open.blogs.nytimes.com/2007/11/01/self-service-prorated-super-computing-fun/>



How Much?

Storage: 5.5 TB
Data Transfer-in: 4 TB

Instances: 100 X 24 hours

S3

EC2



AWS Simple Monthly Calculator

Amazon S3 (US) Amazon S3 (EUR) Amazon EC2 Amazon SQS

<http://calculator.s3.amazonaws.com/calc5.html>

Only \$ 1,465

Simple APIs: S3 REST APIs

- **Just HTTP Requests**
- **Common header**
Authorization: AWS [aws-access-key-id]:[header-signature]
- **create bucket request → mkdir**
PUT /[bucket-name] HTTP/1.0
- **put object request → write**
PUT /[bucket-name]/[key-name] HTTP/1.0
- **list bucket request → ls**
GET /[test-bucket] HTTP/1.0
- **get object request → read**
GET /[bucket-name]/[key-name] HTTP/1.0
- **delete object request → rm**
DELETE /[bucket-name]/[key-name] HTTP/1.0
- **delete bucket request → rmdir**
DELETE /[bucket-name] HTTP/1.0

On-Demand Computing: EC2

- **Virtual Compute Cloud**

- **EC2 Instance**

- 1.7 GHz x86, 1.7 GB RAM, 160 GB Disk, 250 MB/s Network
- Xen-based Virtualization


- **Amazon Machine Image (AMI)**



- Pre-defined or user-built machine image (including OS)
 - OS: Linux, Windows Server
 - App: LAMP, Hadoop, etc
- Start/stop programmatically
- Root-level access

- **Simple APIs**

- SOAP & HTTP Query
- Launch and control instances

Success Story: Online Backup

SmugMug 

[home](#) | [login](#) | [help](#) |  

Make your photos come alive.

- **Unlimited** photos
- No ads or spam
- **Gorgeous** galleries

[Try It!](#)

[View more](#)

SmugMug

- online photo sharing service
- over 150,000 paying customers
- more than 70 million photos
- **keeping 4 backup copies**

Adoption of Amazon S3

- for backup storage
 - existing: 80 TB
 - increasing per month: 10 TB
- cost down
 - save roughly \$500,000 in storage expenditures
- improved reliability
- easy development: one week

Pro zone

Take a tour!

Popular photos

Success Story: Media Service

podcast and videocast production and publishing service

