

SERVICES, APPS AND THE API POWERED WEB

Aka:

THE WEB IS DEAD, LONG LIVE THE INTERNET (AND WHY YOU
MIGHT BE INTERESTED!)

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With thanks to

Agent technology Center, CTU, Prague
Program in Open Informatics

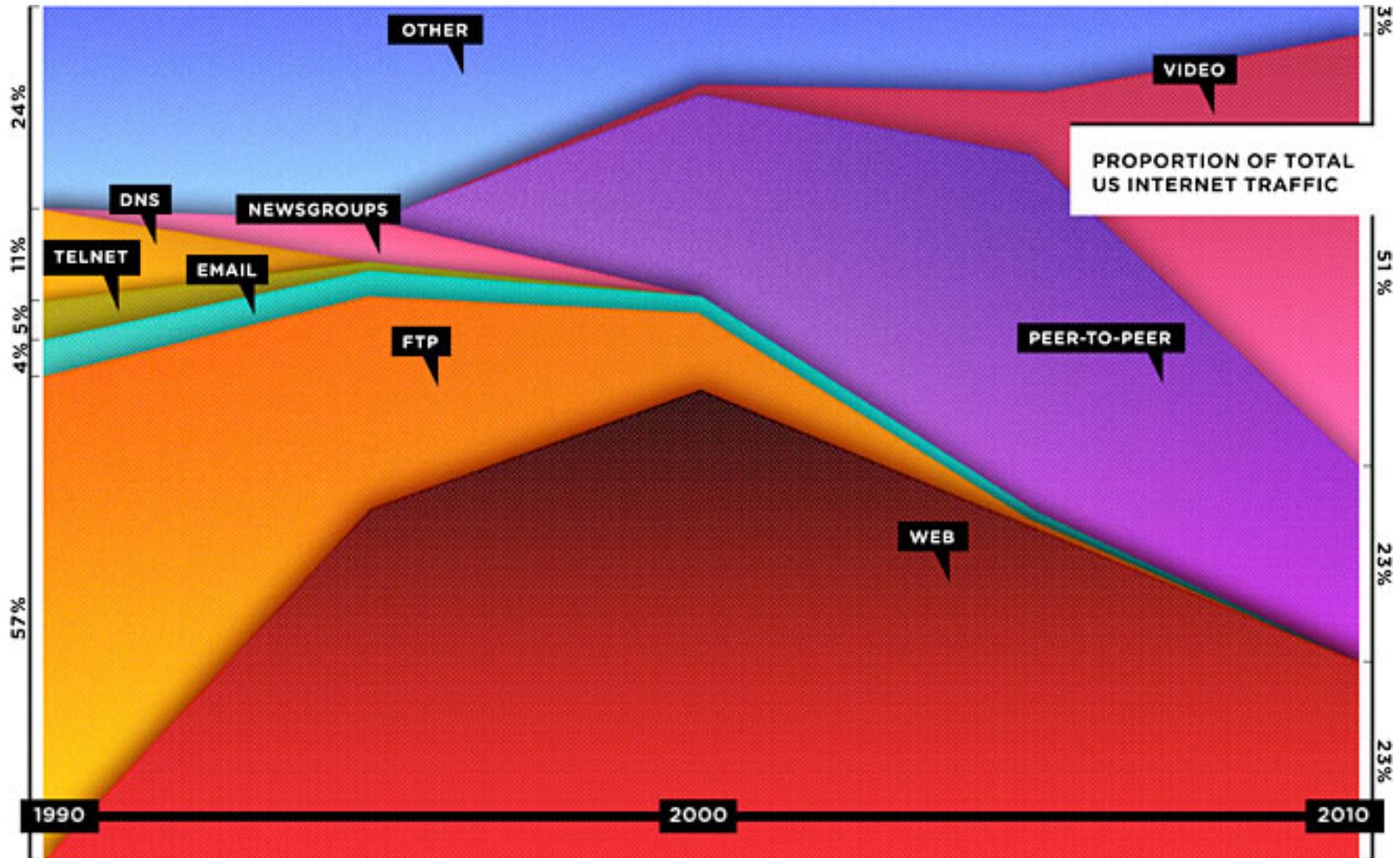


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The Web is Dead, Long Live the Internet

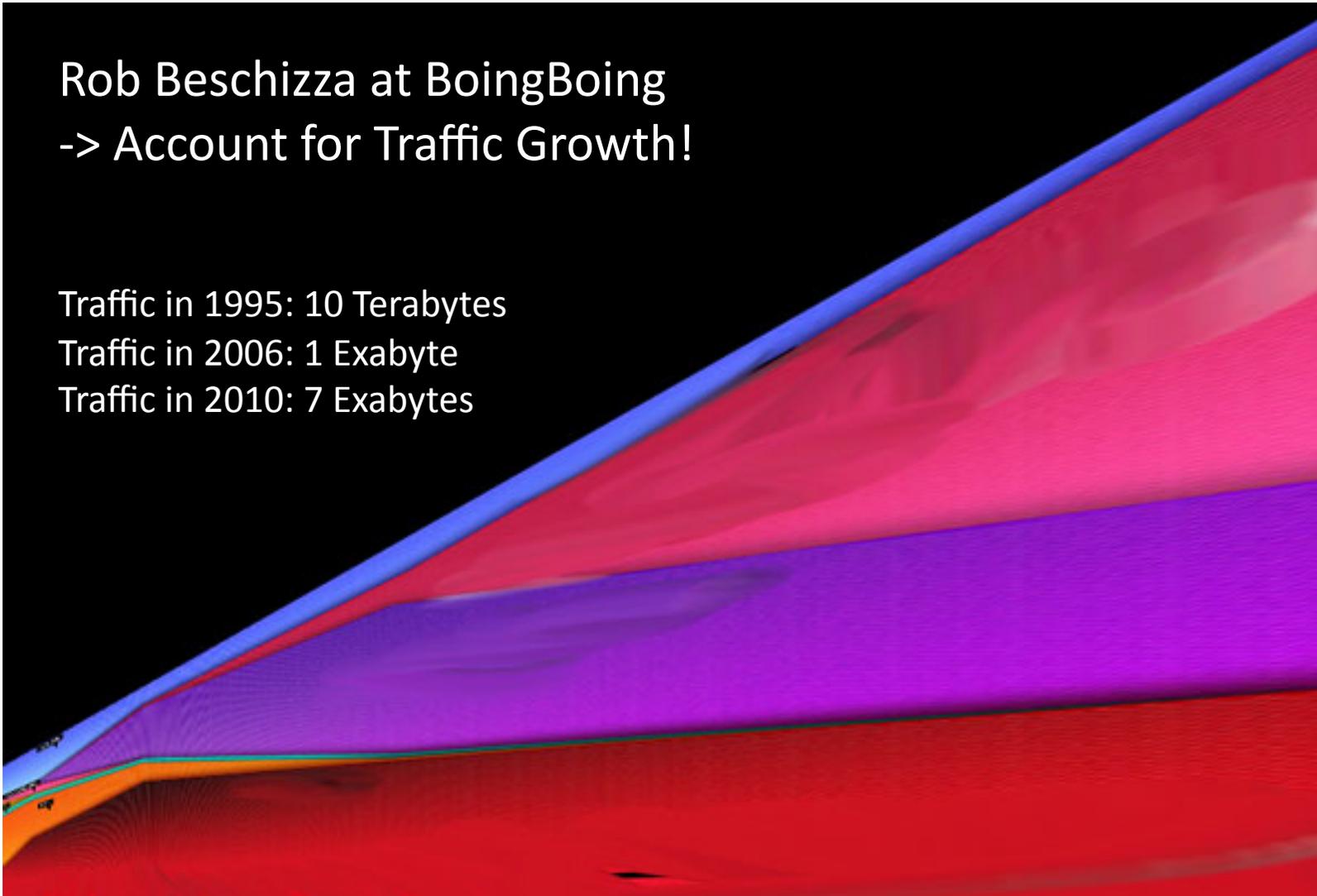
Wired Magazine / Aug / 2010



Wired corrected..

Rob Beschizza at BoingBoing
-> Account for Traffic Growth!

Traffic in 1995: 10 Terabytes
Traffic in 2006: 1 Exabyte
Traffic in 2010: 7 Exabytes



But right or wrong:

- The shift really about traffic or Megabytes
- It's structural:
 - Where is the data?
 - How does it get to people?
 - How do people experience it?
- And this applies to e-Commerce as well as Content

Then & Now

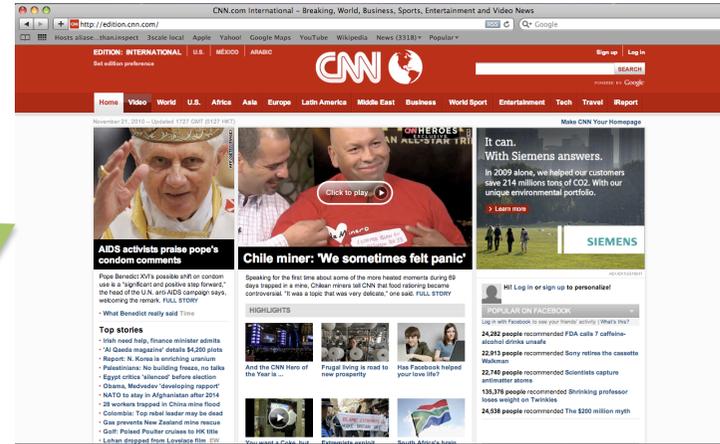
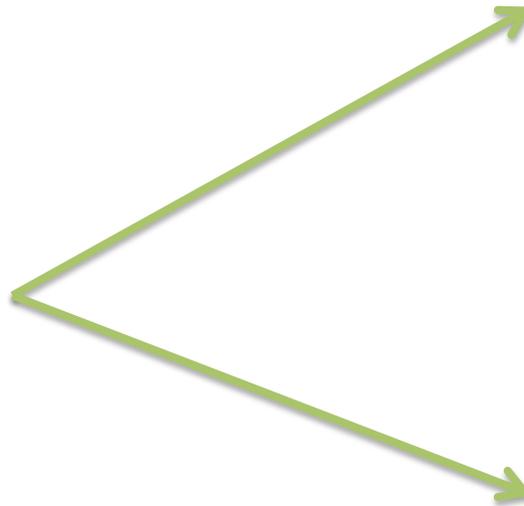
Wired Magazine / Aug / 2010

THEN	NOW
BROWSER	— APPS
SYNDICATION	— SUBSCRIPTION
GOOGLE!!	— GOOGLE??
FREE	— FREEMIUM
JAVASCRIPT	— OBJECTIVE-C
HTML	— XML

Web Page -> App+API

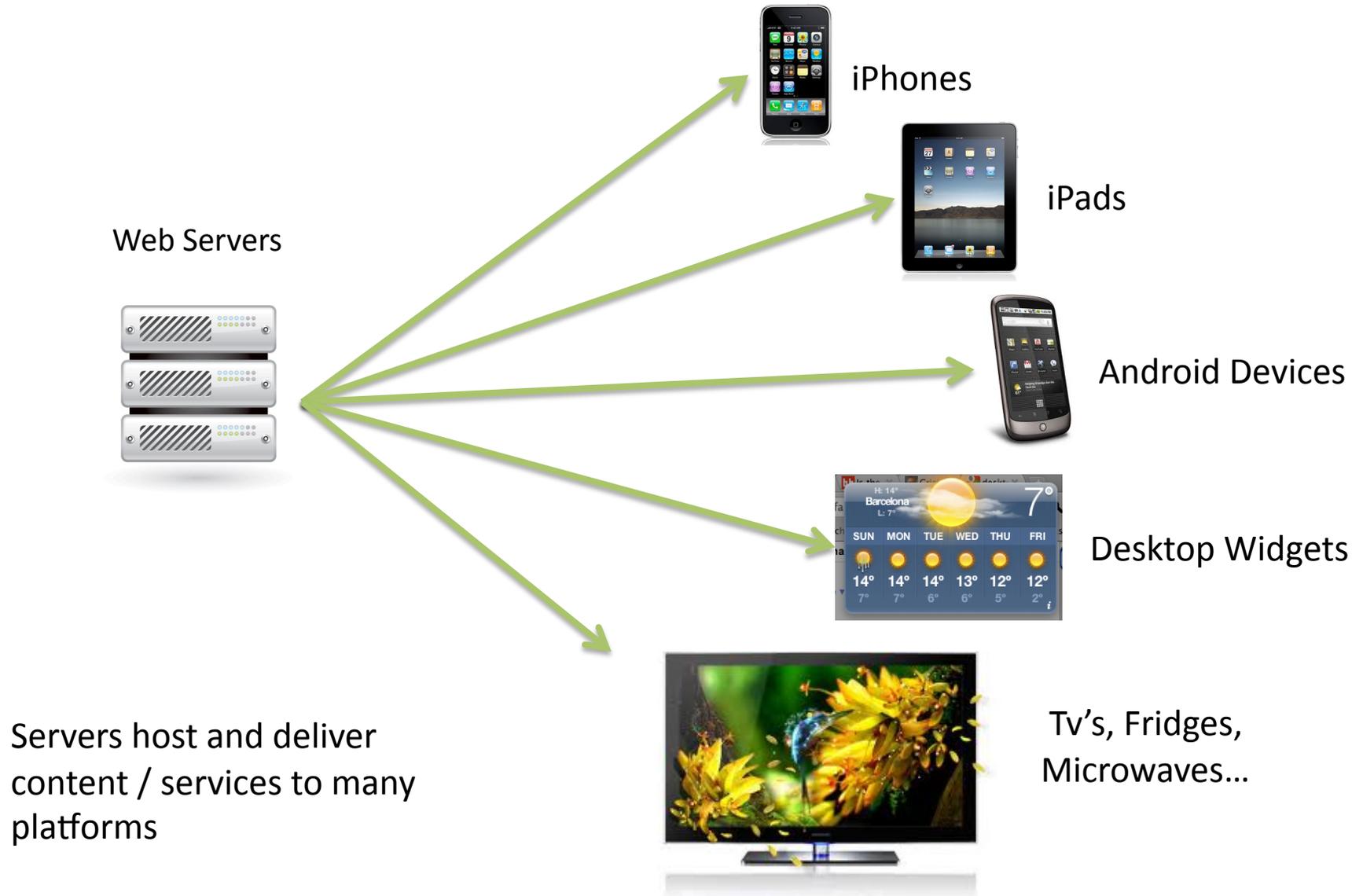
The Web

Web Servers



Servers host and deliver content / services to browsers to view / manipulate

Apps



The Internet in 2015 Will look very different

World
Population **7.3B**

3B Internet
Population

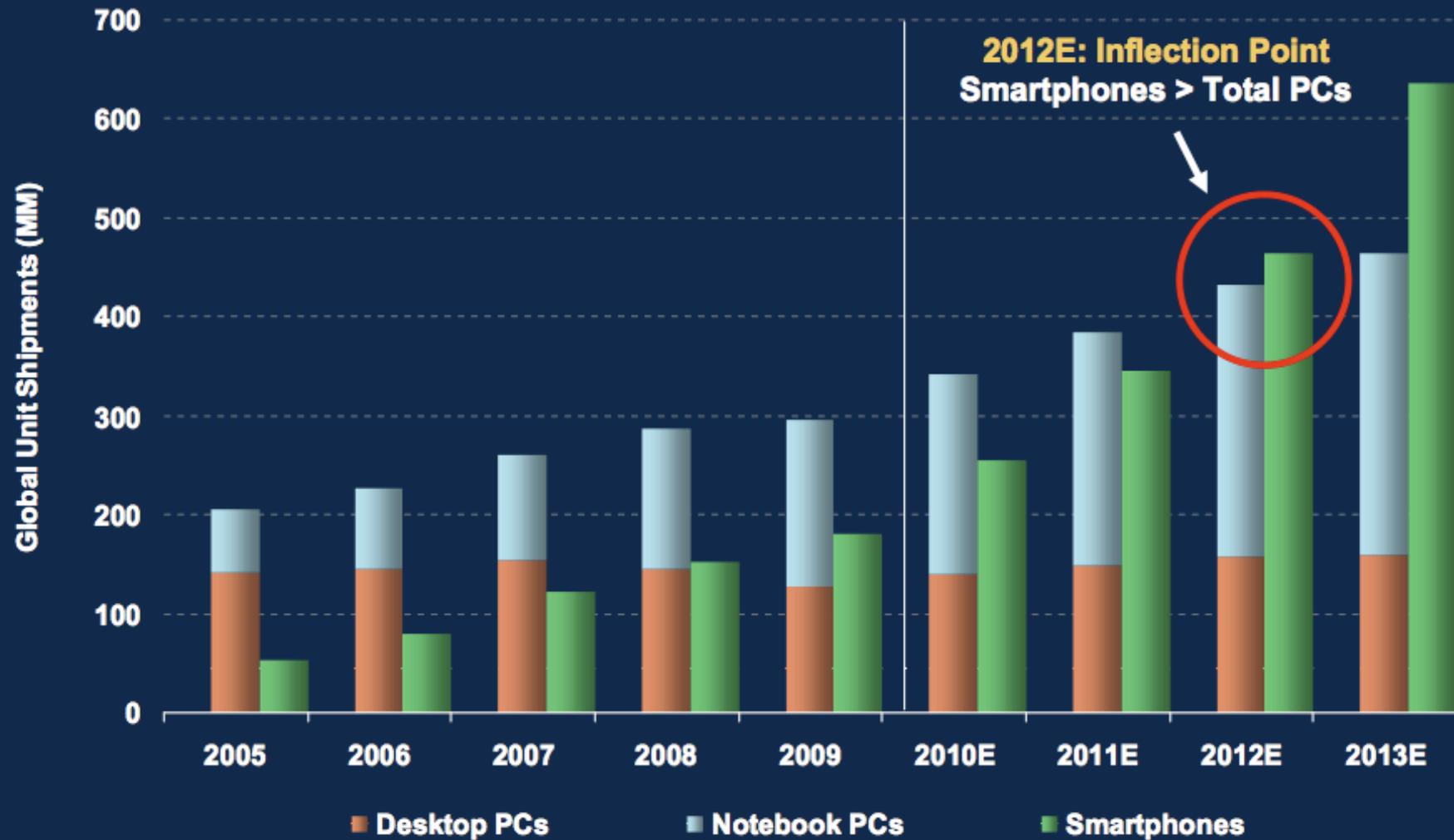
23% Computer Sales (USA) are
Tablets

Internet
Connected
Devices **15B**

800M
Smartphones


2 Billion
Users?

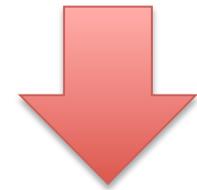
Global Unit Shipments of Desktop PCs + Notebook PCs vs. Smartphones, 2005 – 2013E



Mary Meeker / Web 2.0 Summit / Nov 2010 / San Francisco

Implications

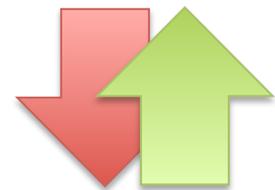
Full Page Web Browsing



App Specific Interfaces



Business Model Change



What is eBay?

What is Amazon?

A: They're not "Web sites" or "Web Portals" – ebay is an auction engine
Amazon is a commerce platform.

In this talk

- I. A bit about the what's happening / trends and why the matter. The App and the API.
- II. Technical / Architectural point of view.
- III. "Saving" the Web.

APPS & APIS

APIs power your Apps

What's really going on with Mobile Applications?

Web Servers



Data Connection

Application

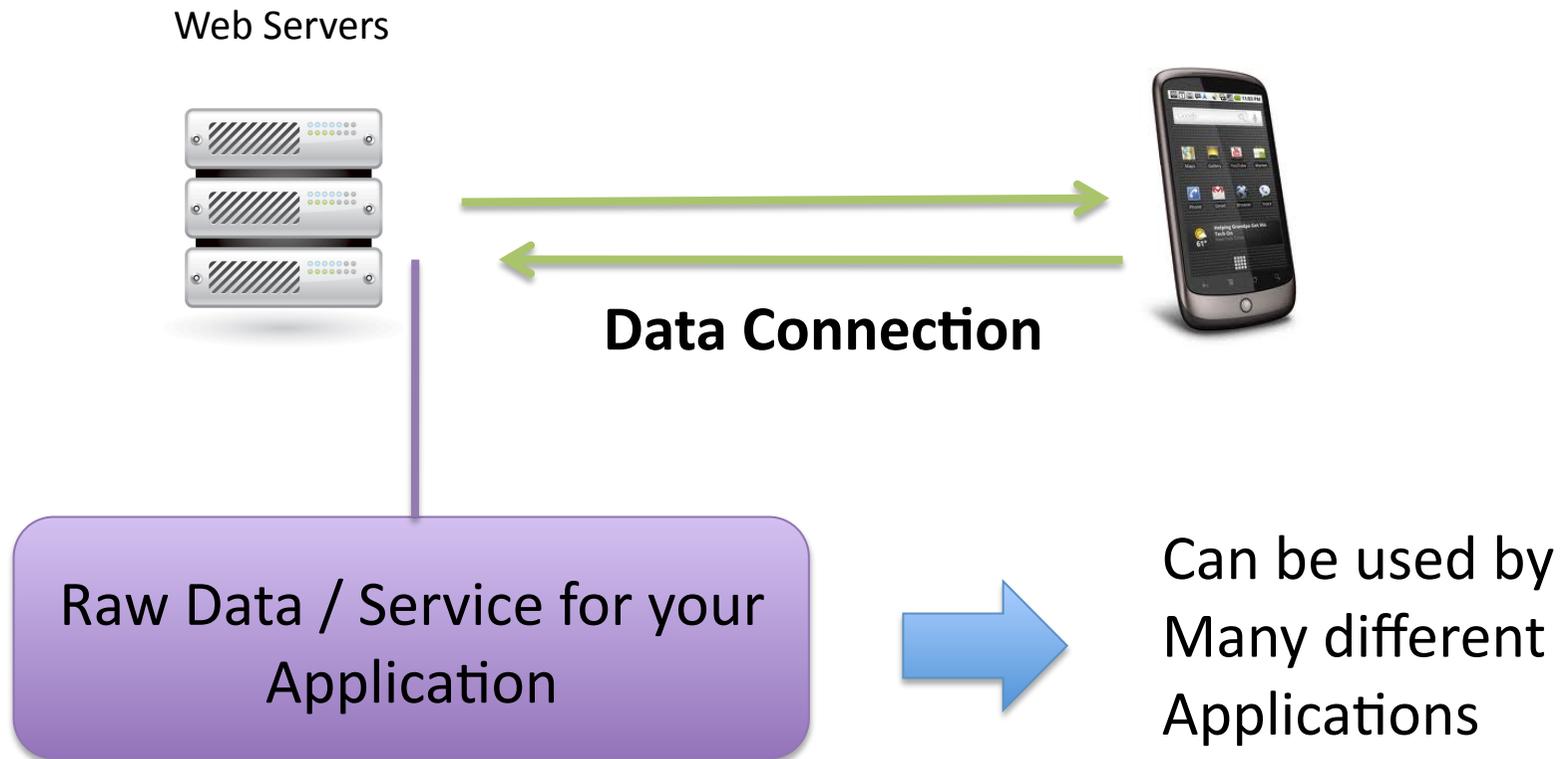


Functions
Features
Graphics
UI

Application often calls “some backend somewhere”

Calling an API !

Which means what?



What do these things look like?

```
<?xml version='1.0' encoding='utf-8'?>  
  <GeteBayOfficialTimeRequest  
    xmlns="urn:ebay:apis:eBLBaseComponents\">  
    <RequesterCredentials>  
      <eBayAuthToken>TOKENGoesHERE</  
      eBayAuthToken>  
    </RequesterCredentials>  
  </GeteBayOfficialTimeRequest>
```

What do these things look like?

```
"images":[  
  {"src":"img/a/1.jpg", "title":"Photo 1", "href":"img/a/  
big/1.jpg", "alt":"Photos www.example.com"},  
  {"src":"img/a/2.jpg", "title":"Photo 2", "href":"img/a/  
big/2.jpg", "alt":"Photos www.example.com"},  
]
```

JSON

RESTfull Web Services

- Resources
- Resource Identifiers (URIs)
- Representations
- Operators
- Response Codes

70-80% of
Web APIs
Are simple
REST-like

Operators

- GET
 - Retrieve : return Information about a resources
 - List: lists the elements of a collection
- POST
 - Create : create new resources
- PUT
 - Update : Modify a resource
 - Create : Create a new resource
- DELETE
 - Remove a known resource

Manipulating
Data
Objects

Response Codes

- 200 OK Standard success response
- 201 Created
- 202 Accepted
- 301 Moved Permanently
- 400 Bad Request
- 401 Unauthorised
- 402 Payment Required
- 403 Forbidden
- 404 Not Found
- 405 Method Not Allowed

Limited Scope
for Response
(but clear)

Evolution of Web Technology

1. Server sends Data, Structure & Styling to the Browser

e.g. `<i>Heading 1</i></h>`

2. Server sends Data, Structure (HTML) +Styling (CSS) to the Browser

HTML: `<h1>Heading 1</h1>` CSS: `h1 { ... }`

Evolution of Web Technology

1. Server separates Data and structure on the server before sending in big chunks

XSLT Transformation for device specific Content

2. Start sending small chunks (AJAX)

e.g. Gmail fetches email in the background –
no full page refresh

The Web is becoming Programmable

Anybody can open up their data /
service for reuse

Trends in the API Economy

(which will likely be bigger than the
App Economy)

Apps Everywhere



APIs: The “Dark Traffic” of the Web



5 Billion API Calls / Day (April 2010)



5 Billion API Calls / Day (October 2009)



3 Billion API Calls / Day, 75% of all traffic (April 2010)



8 Billion API Calls / Month (Q3 2009)



3 Billion API Calls / Month (March 2009)



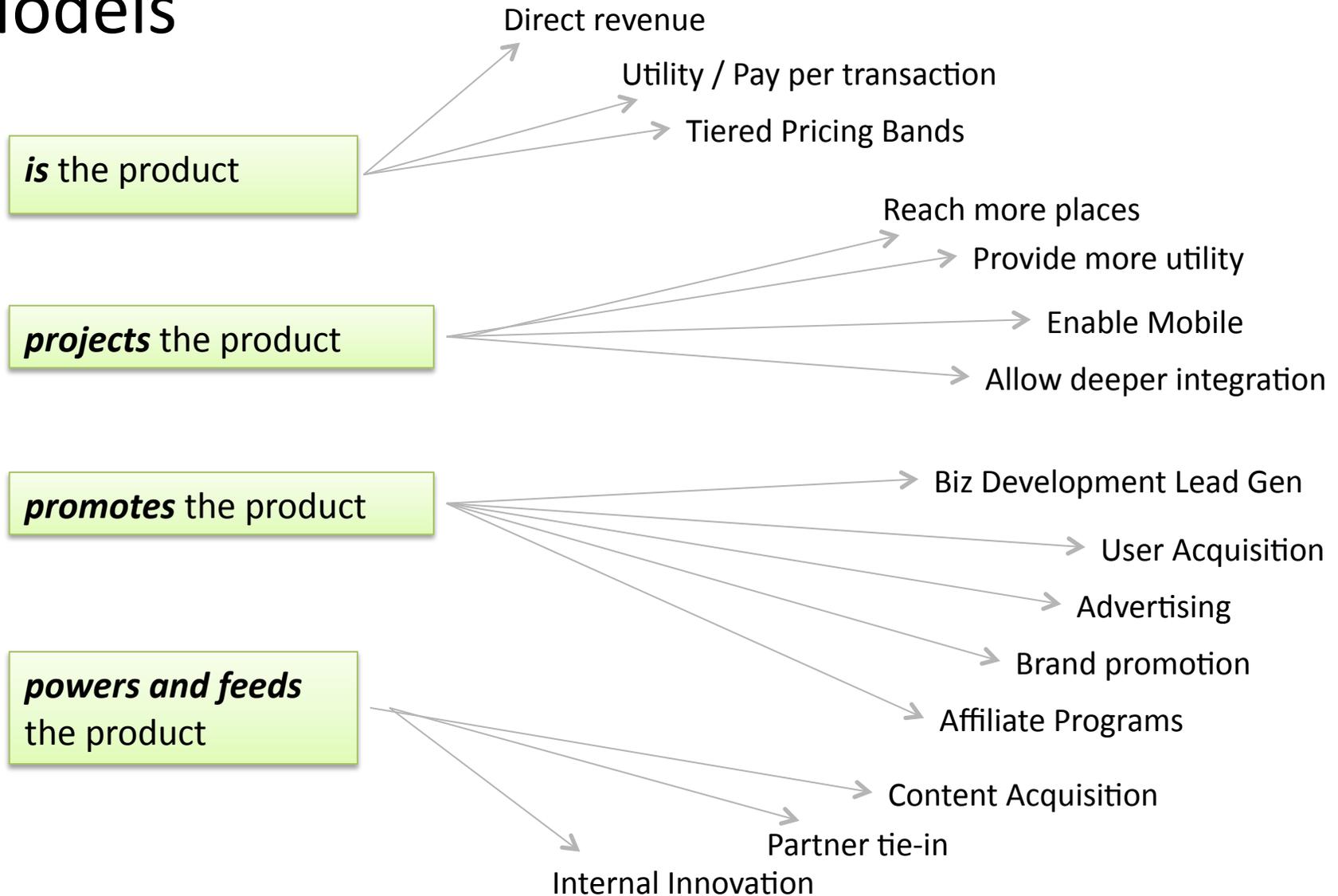
Over 50% of all traffic via API (March 2008)



Over 100 Billion objects stored in S3 (March 2010)

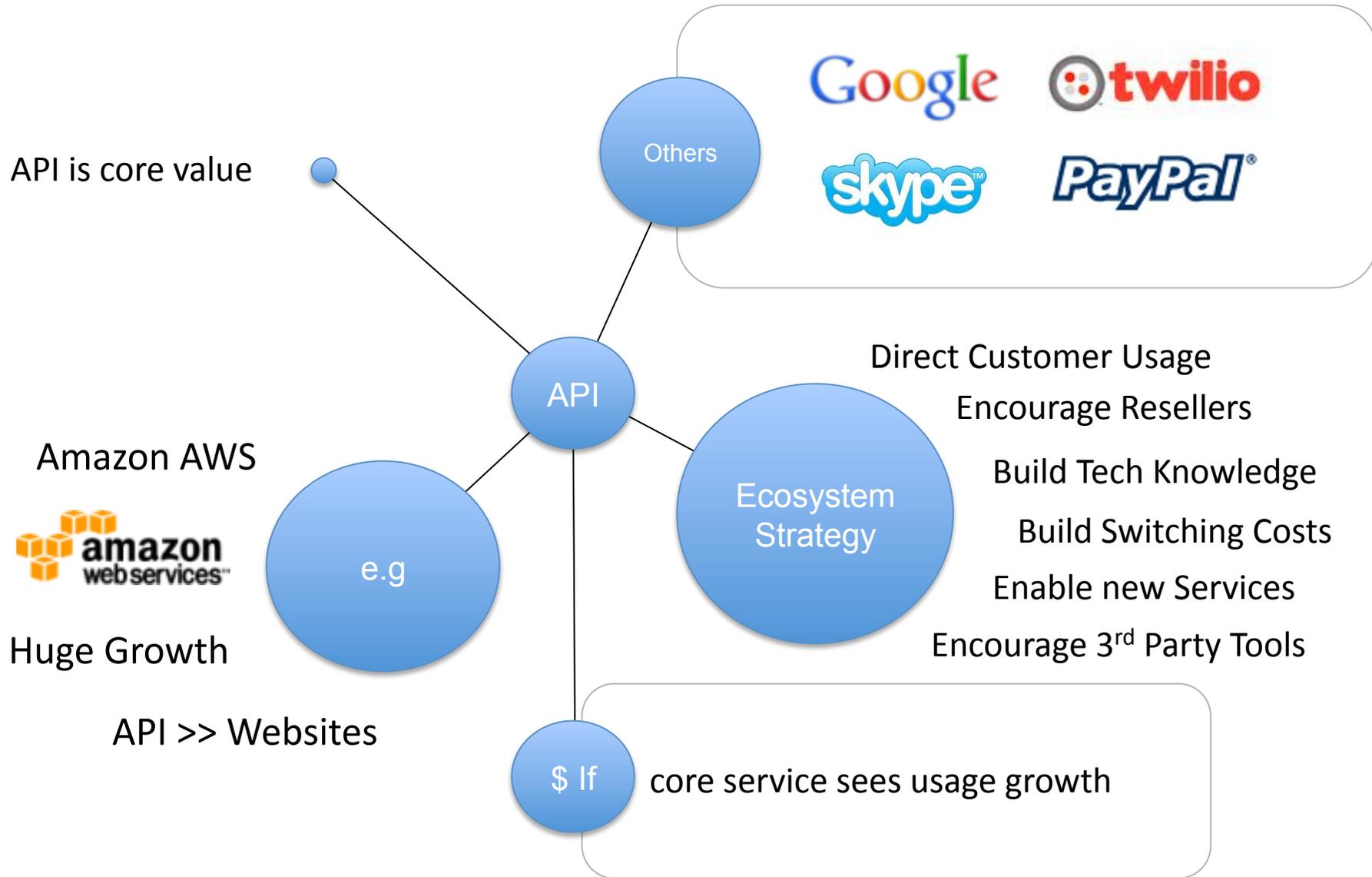
These are “just” the public APIs

API Business Models



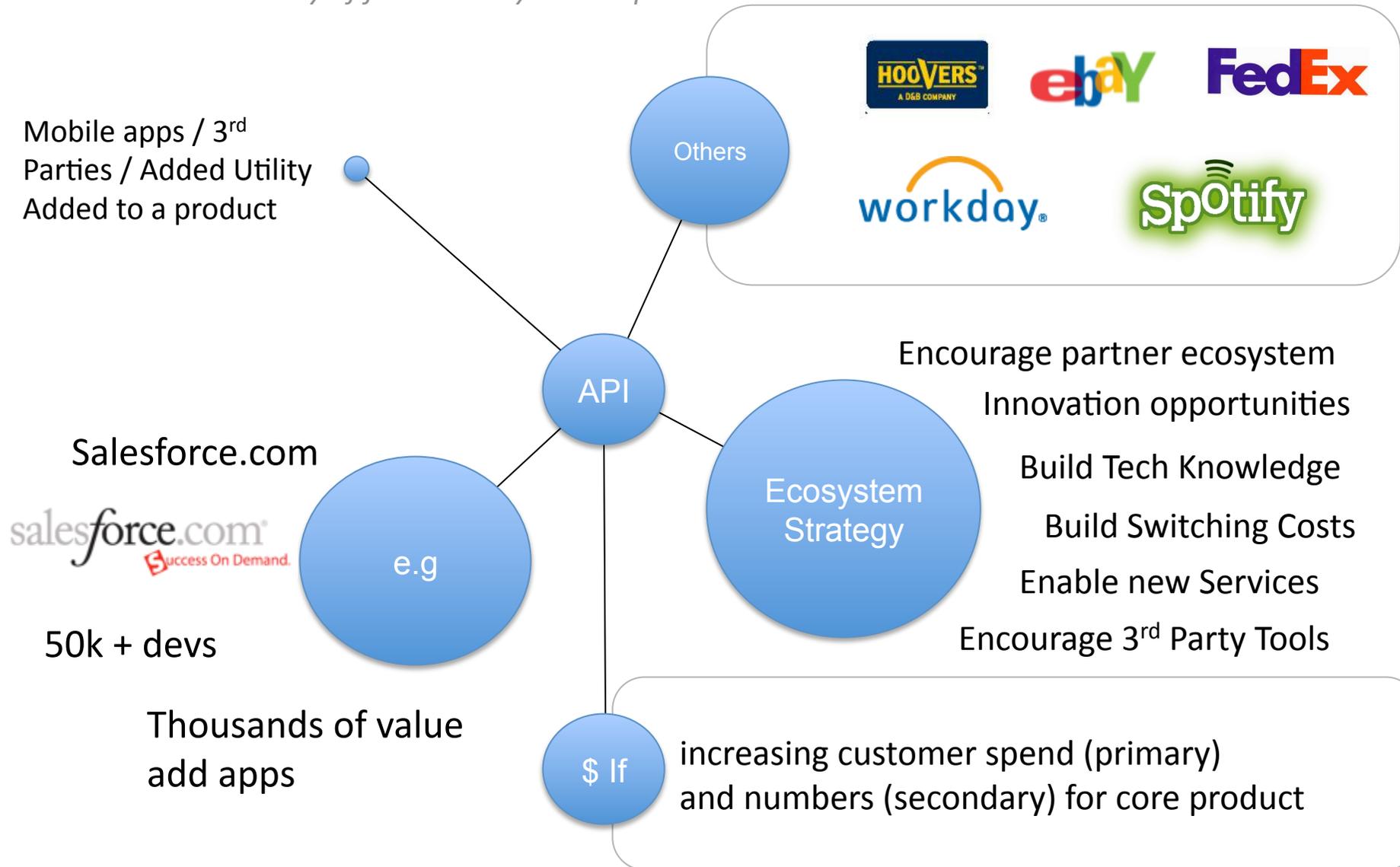
The API IS the product

Core value is tied up in the API



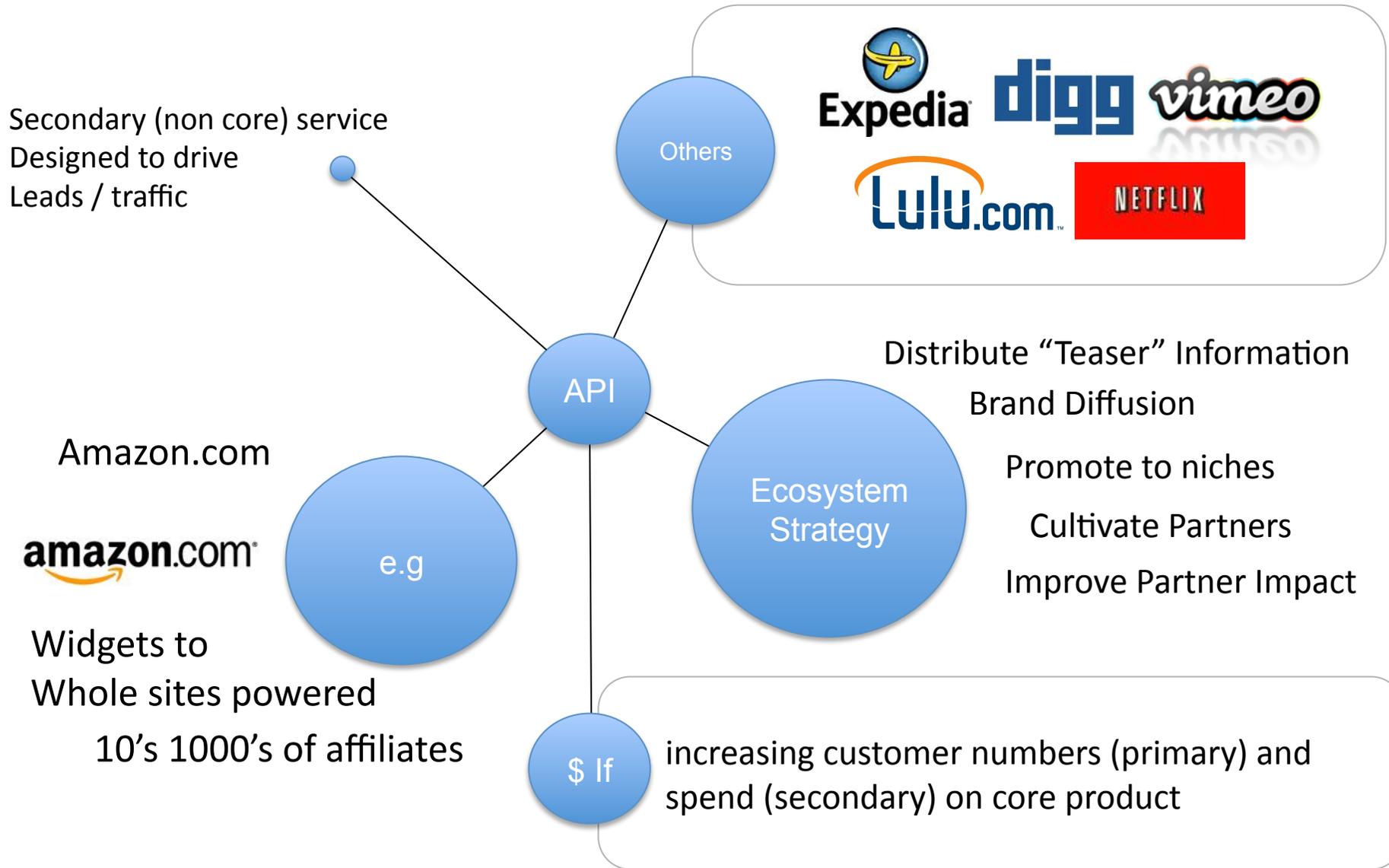
The API Projects the product

Extends availability of functionality to new places



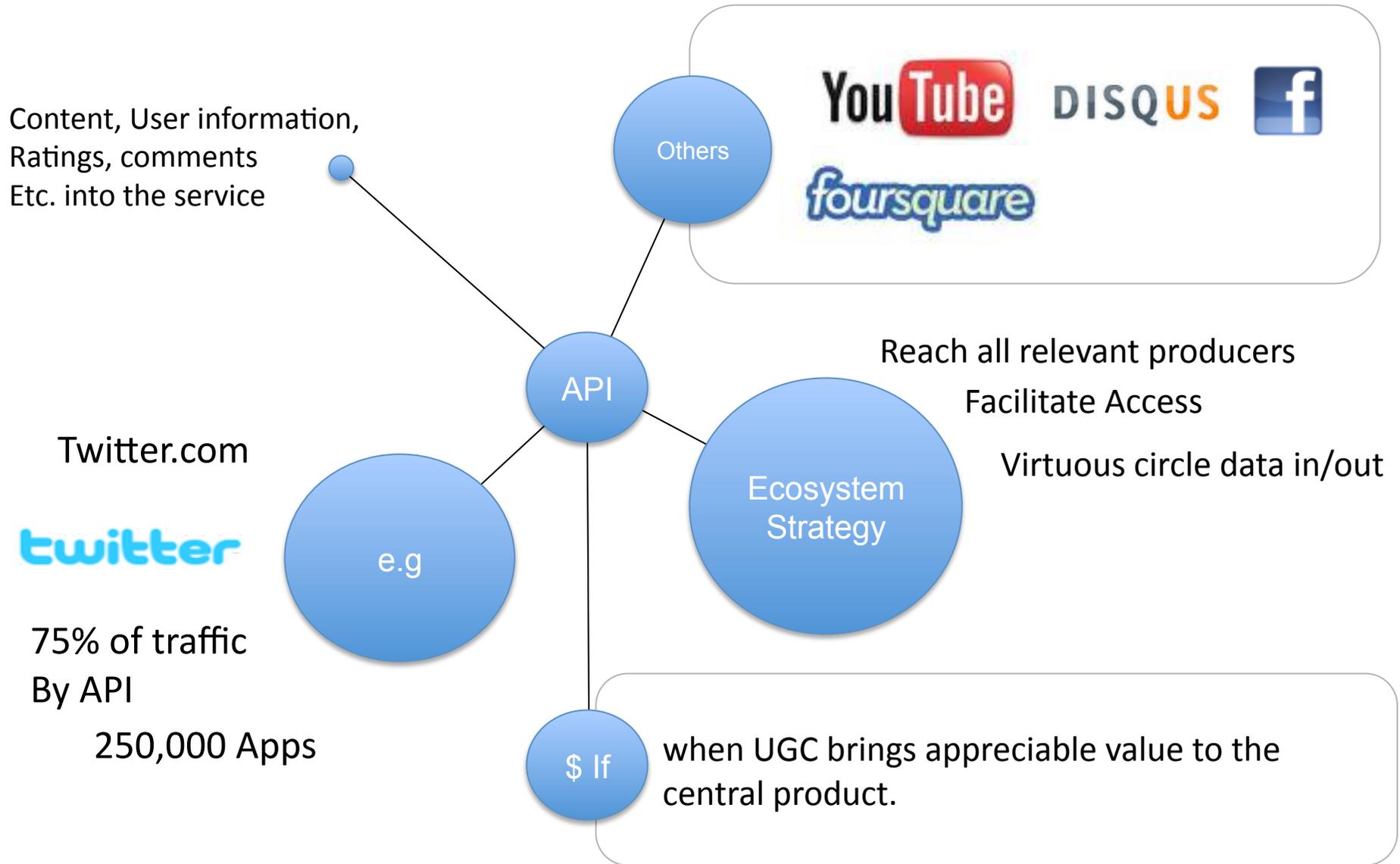
The API Promotes the product

Secondary function and indirect revenue impact



The API Powers and Feeds the product

Content acquisition via the API



Programmable Web Stats

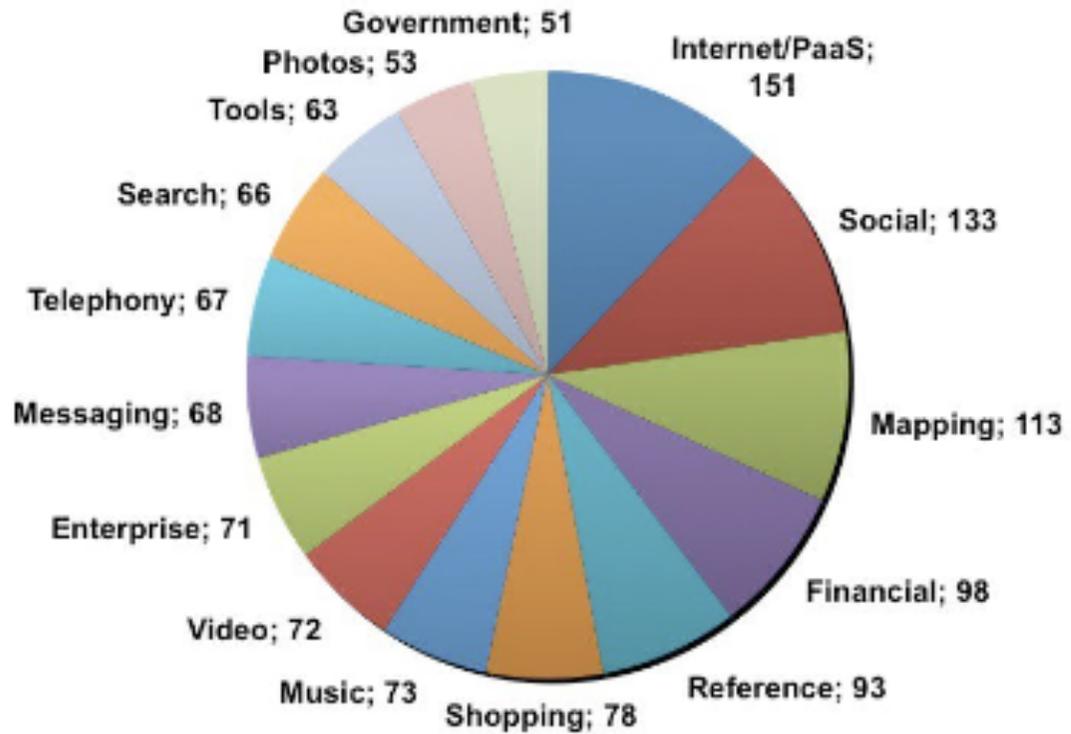
Programmable Web May 2010

May 2010

- 2000+ APIs
- 4800 Mashups

Nov 2010

- 2297 APIs
- 5345 Mashups



Number of API providers in each of the top 15 categories

Example APIs by Layer

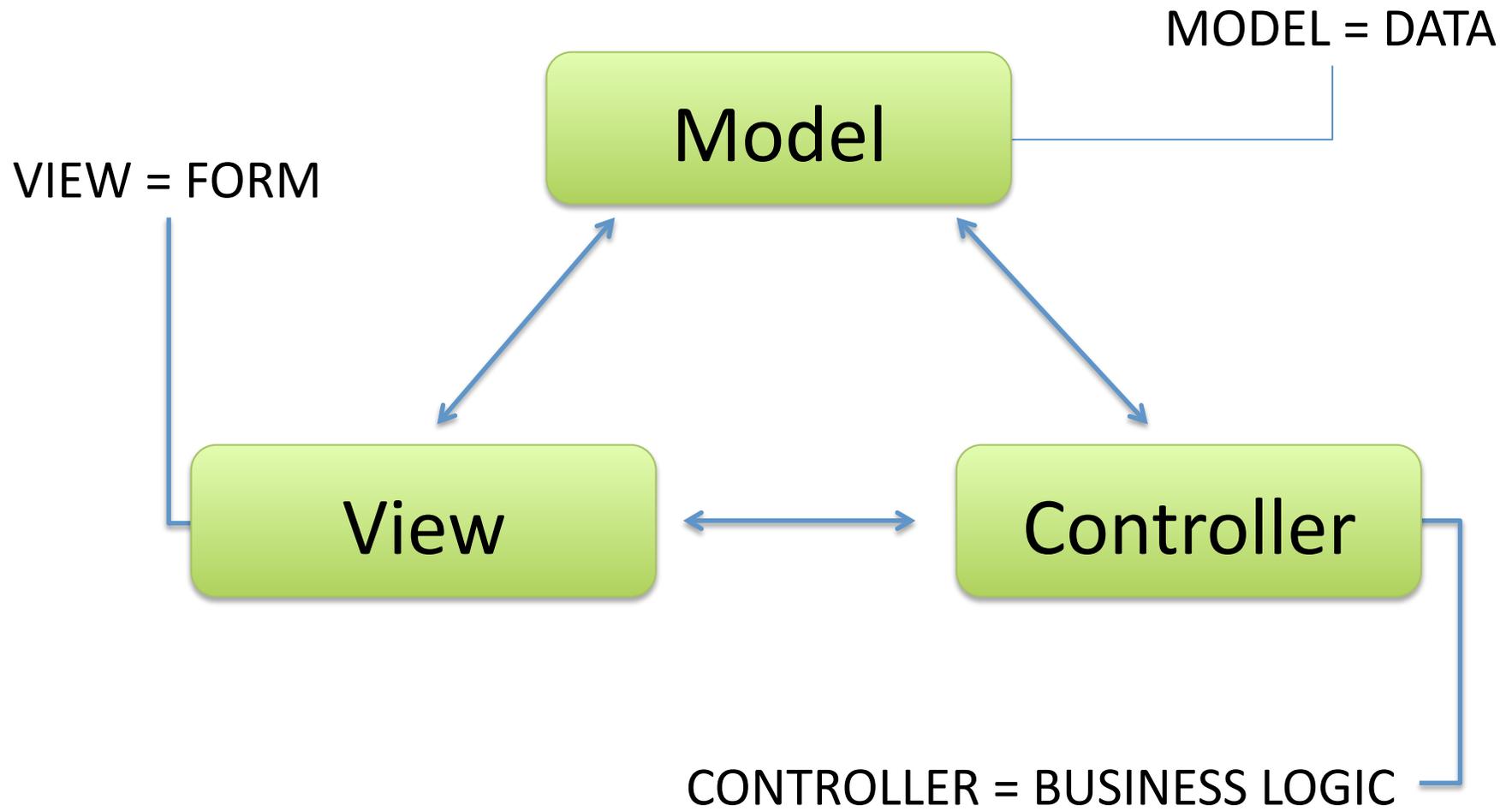


WEBSCALE MVC

An architectural metaphor to help understand this

MVC Stands for Model / View / Controller

Highly Successful Architectural
Pattern for Application Development



MVC = Model / View / Controller

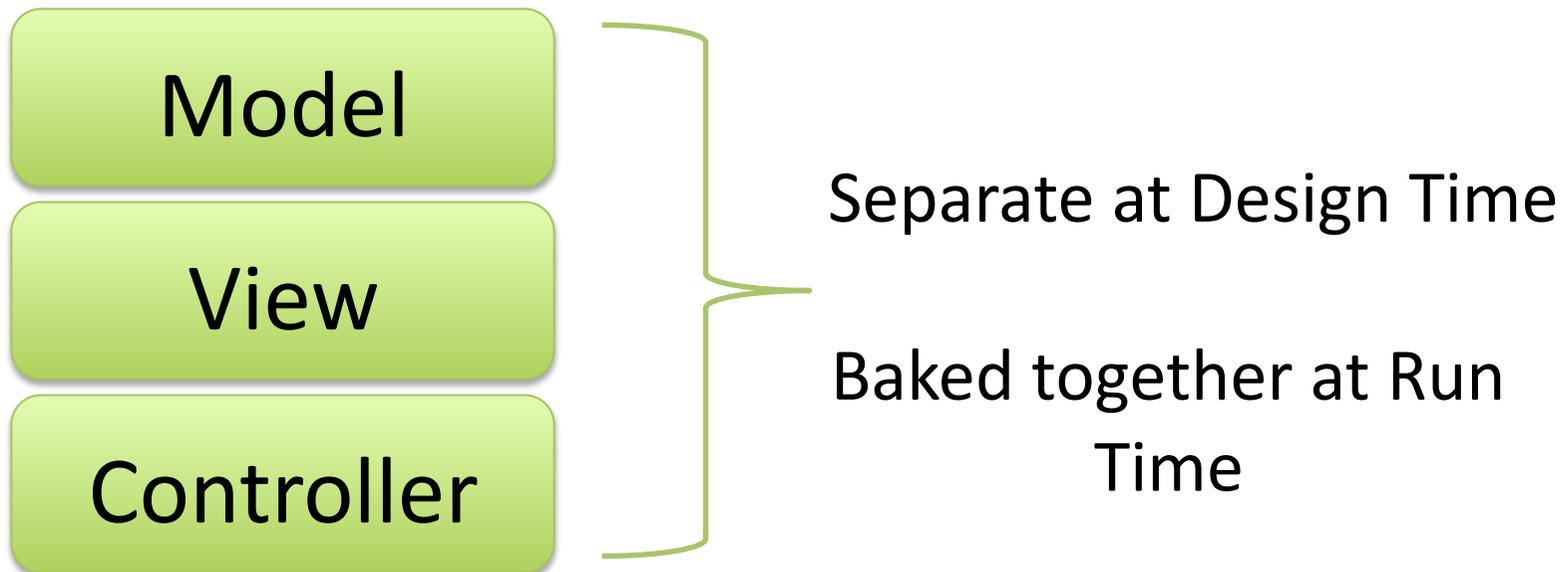


Originally described for
Smalltalk at Xerox Park

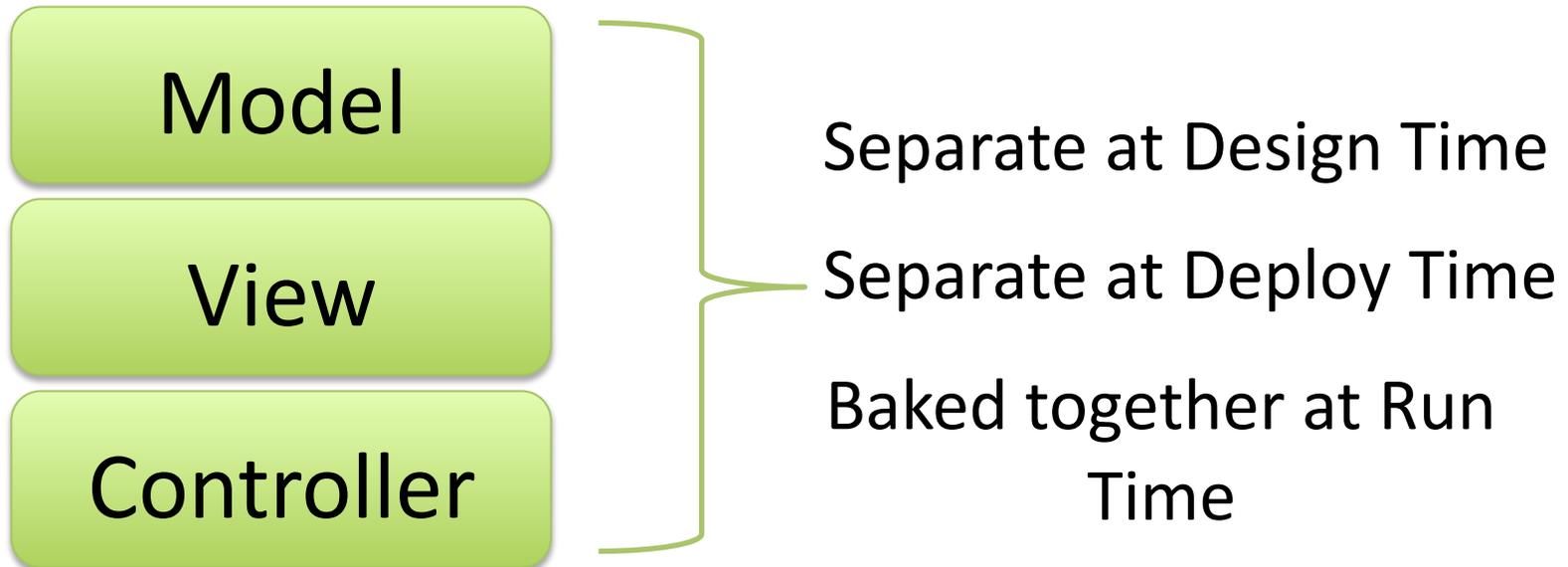
MVC has Revolutionized Software Web App Development

Clear separation between Data,
Presentation & Business Logic

First : MVC Applications



Then : MVC SAAS



But
MVC at “Web Scale” can mean
something much more

Model = Data

- Often most critical asset:
 - Wealth of data which has value
 - Real time / Reference data
 - Sometimes unique / sometimes not
- Often:
 - has great value beyond the company that owns it
 - AND value beyond the ways the company can effectively deliver it.

View = Form

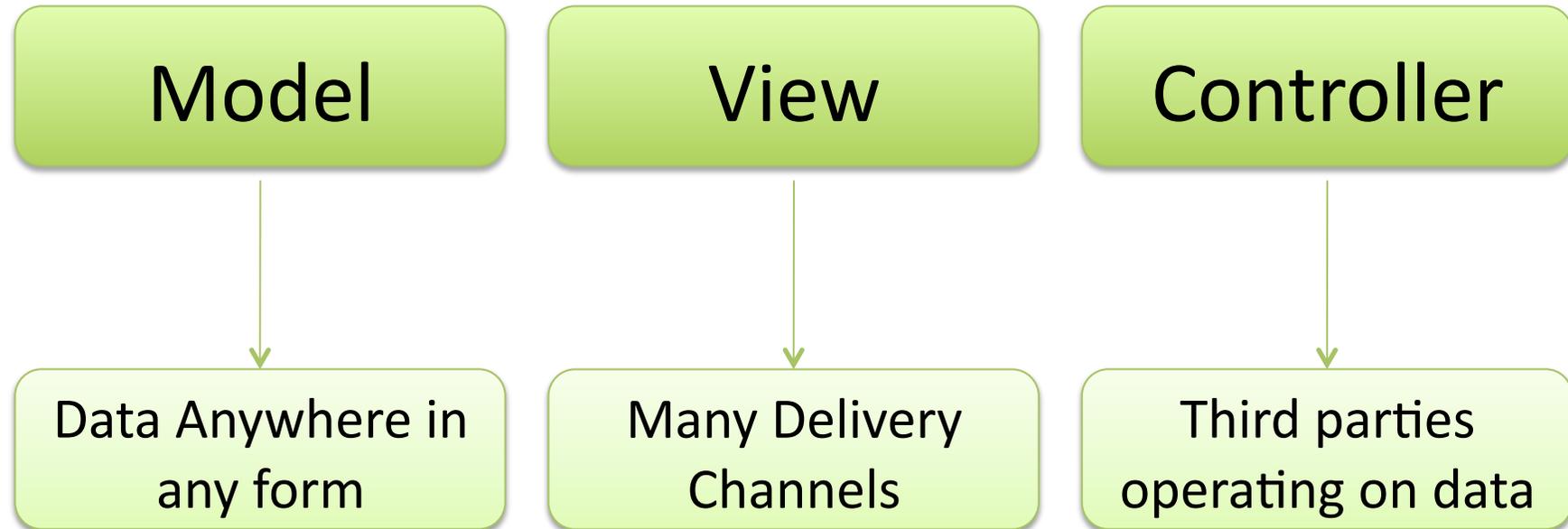
- This used to be the “company web site”
- Now it could be your SAAS application interface
- Increasingly on Android, iPhone, Symbian, ...



Controller = Business Logic

- Also know as the “smart stuff”:
 - Application logic
 - Algorithms
 - Secret sauce
 - Housekeeping like user management / authentication / billing
- Increasingly:
 - Some companies allow others to apply smart stuff to their data
 - Some companies apply their smart stuff to the data of others.

APIs enable Cloud Scale MVC



The New York Times
Expect the World[®]

Bloomberg

WeatherBug

Y!
YAHOO!



ANIMOTO

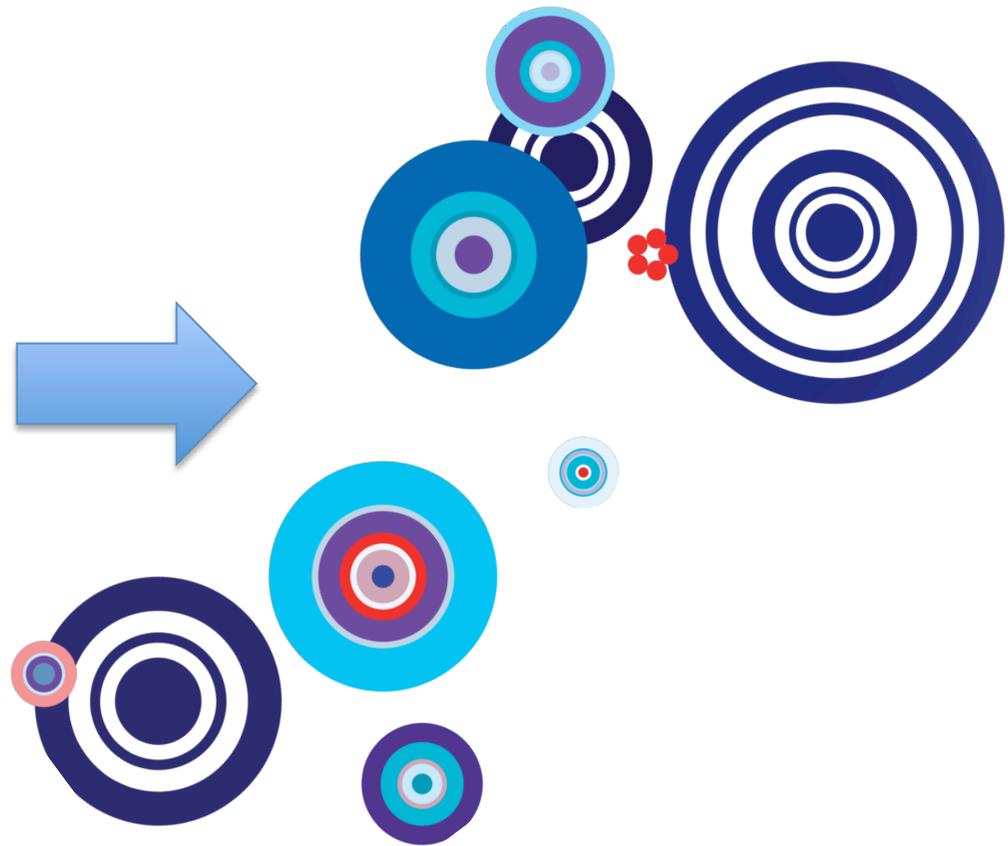
twitter

Impact on Their Business

- Companies focus on core competence
- Leverage their Ecosystem
- Companies are successful when they:
 - Define a clear center of gravity
 - Proactively manage the interfaces with other parts of the value chain

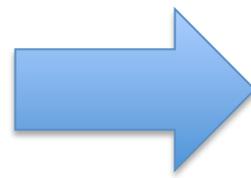
APIs Make this work: Models

An API delivers
you Data in Raw
Form



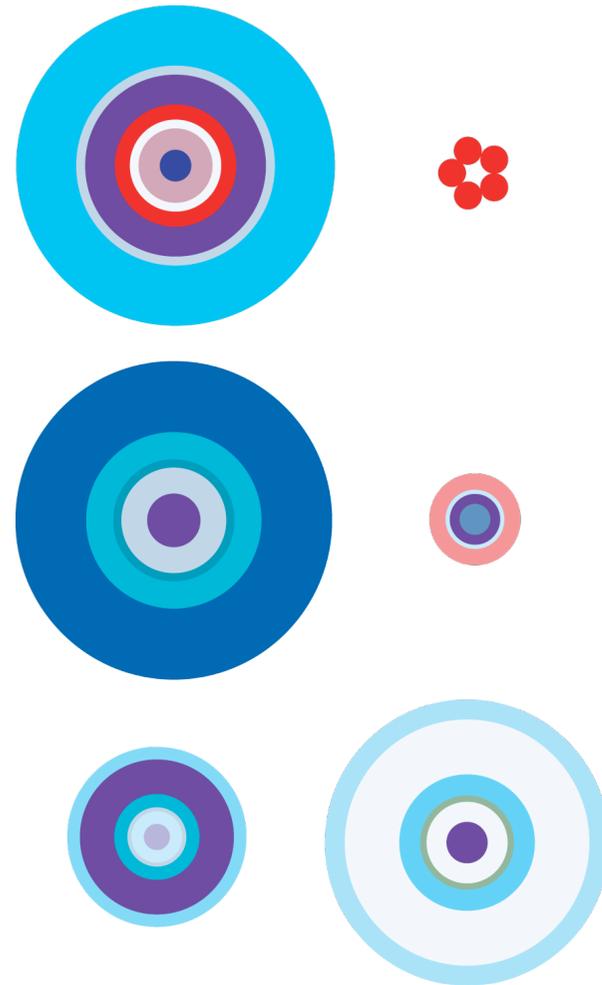
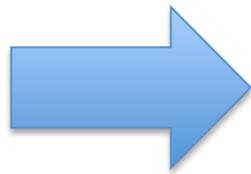
APIs Make this work: Controllers

APIs Provide
Access to
Smart
Processing



APIs Make this work: Views

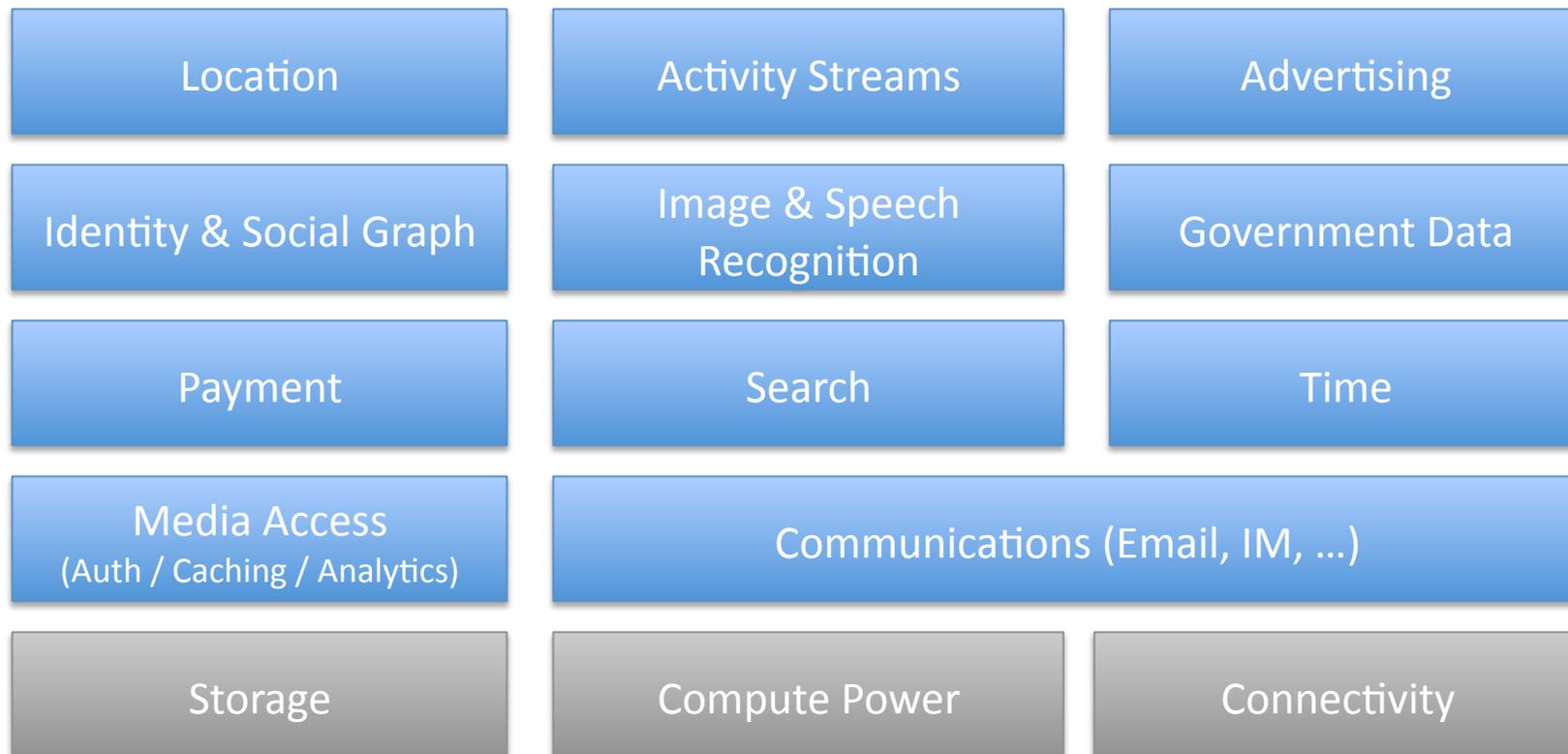
APIs feed many possible ways to consume Data & Services



A fourth element – The Framework – The Internet Operating System

(Normally MVC needs some glue)

Internet Operating System (Tim O'Reilly)



Elements of the “Internet Operating System” already API Driven

Search

Advertising

Location

Time

Media Access

Identify & Social Graph

Communications

The Google logo, consisting of the word "Google" in its characteristic multi-colored font (blue, red, yellow, blue, green, red).The PayPal logo, the word "PayPal" in a blue, italicized, sans-serif font with a registered trademark symbol.

C.f. Tim O'Reilly

The Internet Operating System Emerging



PRESERVING KEY PROPERTIES OF THE WEB

These changes have huge potential – but we need to take responsibility

Critical we preserve the “linky-ness” of the Web

(Link to anything from anywhere)

Problem: “Apps” don’t often to easily
allow you to navigate beyond their
boundaries

(there is a risk we’ll loose linkyness)

In Fact: Apps in some cases are re-creating walled gardens

(hopefully this is a temporary phenomenon)

See Tim Berners Lee's Article –
Scientific American Nov/22/2010:
The Web also needs defending

Tim Berners Lee / 22nd November 2010 –

<http://www.scientificamerican.com/article.cfm?id=long-live-the-web>

Easy to think “The Web is part of nature – we don’t control it”

Not True! - We control it's properties
– we have responsibility for its
evolution

To help keep the web moving forward

Standardisation will have a huge impact

HTML5 and APIS / APPs need to blend well overtime

Keeping APIs Easy to Use & Apps easy to build across platforms will be a key challenge

CONCLUSIONS

The Web / Internet is rapidly becoming
an open programmable computing
system

Web Page Browsing will decline &
Apps / APIs become the norm

Is the Web Dead?

- Depends on your definition!
- If you take the web as an information application running over the Internet – then it most definitely isn't – it's evolving very very fast.

The next 5 years will see dramatic changes in the structure of the Web & Internet

The shift from Web Pages to Apps
+APIs is at the core of this change

Thank You & Have Fun!

Steven Willmott / 3scale networks

Find 3scale at <http://www.3scale.net>
Find me at steve@3scale.net & @njyx



Out of the box management infrastructure to power your API & App Strategy

<http://www.3scale.net/>

RESOURCES

Resources

- <http://www.programmableweb.com>
- <http://www.zdnet.com/blog/hinchcliffe/open-apis-reach-new-high-water-mark-as-the-web-evolves/215>
- http://www.sexywidget.com/my_weblog/2008/11/api-business-mo.html
- http://www.3scale.net/wp-content/uploads/api_ecommerce.pdf
- http://www.3scale.net/wp-content/uploads/api_media_companies.pdf
- <http://www.slideshare.net/sanjayjhawar/apis-20-presentation-at-the-telco-20-conference-in-orlando-11-december-2009>

Resources

- <http://www.slideshare.net/fedecarg/open-platforms-and-apis>
- <http://www.slideshare.net/openplatform/op-commerciallaunchv2>
- <http://www.slideshare.net/samramji/darwins-finches-20th-century-business-and-apis>
- <http://www.slideshare.net/jmusser/pw-glue-conmay2010>
- <http://www.slideshare.net/3scale/apis-the-glue-of-cloud-computing>
- <http://www.slideshare.net/Mashery/the-business-of-apis-2009-programmablewebcom>

Resources

- Facebook number of active users: Sept 2009: 300mil, Feb 2010: 400mil, June 2010: 500mil. The 2B figure on slide 10 is an (potentially aggressive) estimate but illustrates that the largest internet companies are bumping up against the limits of the online population and not far of the whole population
- <http://www.internetworldstats.com/stats.htm>
- <http://business.rediff.com/slide-show/2010/sep/03/slide-show-1-tech-internet-users-in-2015-top-7-nations.htm>
- <http://www.digitalfamily.com/mobilewebdesign/2009/08/smartphones-will-overtake-computers-in-2011/>
- <http://www.electronics.ca/presscenter/articles/1247/1/Global-Smartphones-Market-to-Reach-80442-Million-Units-by-2015/Page1.html>
- <http://www.forrester.com/ER/Press/Release/0,1769,1340,00.html>
- <http://www.sys-con.com/node/1317657>