“Web 2.0, like Wall Street, is a series of markets in which mere milliseconds can make an enormous difference. The more you look, the more you see what the two sets of markets have to teach—and warn—one another.”

Tim O’Reilly, from *When Markets Collide*, page 1
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01: When Markets Collide
As Web 2.0 markets mature, they are starting to display tendencies we have long associated with financial markets. It’s still very early, but we’re starting to see ways in which Wall Street ideas are infiltrating Web 2.0 markets, and Web 2.0 principles are finding their way on Wall Street.

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Correction
In 2.0.1, we incorrectly identified the nationality of Carlota Perez. She is Venezuelan. We apologize and regret the error.
Web 2.0 and financial markets have a lot in common. Both are highly networked information markets driven by collective intelligence. Both have a lot of money at stake. But financial markets have been around a lot longer and are much bigger and more mature, so they might give us insight into possible futures for the Web 2.0 economy. And when you look closer, you can see that Wall Street (used here as a proxy for financial markets in general) is learning from Web 2.0, too.

We've barely begun studying the implications of this analogy and the crosstalk between these two marketplaces, but we've already uncovered so much of value that we decided to share what we've learned so far in order to start a broader conversation. We're going to be looking at this for a long time.

One of my first conversations was with Peter Bloom, former CTO of Wall Street powerhouse Salomon Brothers. Peter is now a managing director at private equity firm General Atlantic Partners. He pointed out three areas where Web 2.0 principles are invading Wall Street:

1. Technology gives small firms disruptive leverage

In 2005, Craig Newmark, founder of the self-service classified advertising site Craigslist, put together a table showing the employee count at top Internet properties. Craigslist, seventh in terms of pageviews, had only 18 employees at the time. (In a similar survey late last year, Craigslist was still at #7, but it had exploded in headcount—all the way to 23 employees.) It’s a vivid example of the disruptive potential of Web 2.0. Peter pointed out that the same asymmetric competition is striking Wall Street.

Wall Street trading volume has come to be controlled by large firms, so entrenched and powerful that they are referred to by insiders as “the 14 families.” Now, due to the evolution of technology for program trading, companies with only a few employees can compete successfully with the giants. Peter pointed

### Top Sites on the Internet (2005)

<table>
<thead>
<tr>
<th>Rank</th>
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<th>Employees</th>
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<td>1</td>
<td>Yahoo!</td>
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When Markets Collide

“Web 2.0 may have begun with decentralization and peer-to-peer architectures, but if Wall Street and Google are guides, it will end with massive, centralized data centers extracting every last drop of performance.”

to one program trading firm in New York that, he says, executes about 3 percent of all trades on the NASDAQ—with fewer than 40 employees. There are several other firms of comparable size and trading volume throughout the country, including non-traditional locales like South Carolina. BATS Trading, for example, took less than two years to become America’s third largest stock market, behind the NYSE and NASDAQ.

While both Web 2.0 and Wall Street do confer advantages on large firms, be alert to both threats from and opportunities for tiny firms with disproportionate leverage.

2. Performance matters

Much as Google has found in web search, speed—as measured in milliseconds—matters on Wall Street. Not too many years ago, firms like E*TRADE guaranteed their clients that a trade would be executed within nine seconds. Recently, that guarantee has been eliminated because the vast majority of U.S. equity trades are now executed in two seconds or fewer. Meanwhile, the "direct market access" platforms used by program trading firms guarantee their clients 1,000 transactions per second. Do the math. The opportunity for timing arbitrage (once a huge source of revenue for Wall Street insiders) has vanished.

So important is the quest for a performance edge that the one of the firms Peter told me about recently moved servers back to Wall Street from South Carolina. The few milliseconds the company shaved from its execution time by locating close to the exchange made a measurable difference in its business.

Mark Gorton tells a similar story. He’s the founder of the pioneering program trading firm Tower Research Capital, but perhaps better known to technologists as the founder of the peer-to-peer file-trading service LimeWire. Mark founded another of his companies, Lime Brokerage, one of those tiny firms that control an increasing share of trading volume on major exchanges, because he couldn’t find a company that could execute Tower’s trades quickly enough.

Do peer-to-peer architectures in the mode of LimeWire play any role in Mark’s work on Wall Street? Not at all, he says. The performance just isn’t there. On Wall Street, every millisecond counts. “Centralized technology is a lot easier,” he says, echoing almost word for word Eric Schmidt’s backstage comment to me—in a much different context—at last year’s Web 2.0 Summit.

Web 2.0 may have begun with decentralization and peer-to-peer architectures, but if Wall Street and Google are guides, it will end with massive, centralized data centers extracting every last drop of performance. This trend is already apparent with the rise of applications based on massive data centers,
A quick guide to some of the parallels between the markets of Web 2.0 and Wall Street

1. **Latency**
   If, as some suggest, the latency of financial transactions is moving from milliseconds to nanoseconds, approaching zero, the business benefits of even incremental speed increases can be considerable. That’s why Automated Trading Desk moved equipment from South Carolina to New York: Gaining the handful of extra milliseconds made business sense. It’s all about speed. But speed doesn’t necessarily make you smarter. As Bill Janeway puts it, “It’s cheaper, faster, and easier to buy the wrong stock.” Similarly, for many years the canonical Google front page was as bare as possible: a lighter page meant a faster load meant more reliable customers.

2. **Connectivity**
   Connectivity is the liquidity of Web 2.0. Liquidity gives financial markets the lubrication to move; connectivity gives Web 2.0 an opportunity to exist. Your fastest, most efficient application won’t accomplish much if it can’t connect to the Net. No wonder so much effort is being put into Web 2.0 applications that can work offline—it would change our definition of how we can do business in Web 2.0. Another way connectivity is like liquidity: The more desperately we need it, the less available it is.

3. **Sensors and actuators**
   We all have access to the pretty much the same sensors. As Peter Bloom notes, the trick is to extract the relevant signal from the avalanche of noise. It’s identifying the actuators and putting them to work in a timely manner that helps define business winners. We acknowledge that almost everything we need to know is in the cloud; the trick is to know where to look and how to act.

4. **Reputation**
   Once upon a time, a stockbroker performed an almost curatorial role. He (it was usually a he) had access to the proprietary data and decided how best to distribute it. Now, with reputational systems ranging from eBay to SwiftTrade rating us in sundry parts of our business lives, we don’t have to believe someone has all the information. We have evidence. With this information, each stop in a transaction, whether in financial or Web 2.0 markets, can become a new point of innovation.

— J.G.

**How fast is too fast?**

Hal Varian, Berkeley economist and Google consultant, calls the race for speed on Wall Street “privately valuable, but socially wasteful. If I can buy stocks one millisecond before you, I can potentially make more money. Everybody would be better off if they could agree to a slower pace, but no one is willing to do that unilaterally. Back in the ’90s, NASDAQ used 19.2 kbs modems that had special hardware to slow down some trades so that there was no advantage to a particular location on the network. This made for a level playing field. Those days are over. With all the competitive exchanges, you can now optimize position.”

**How the Google ad auction works**

Unlike other ad auction systems, Google’s doesn’t sell the top position to the highest bidder. One of the unique insights that made AdWords so compelling is that Google ranks ads according to the product of the auction price and the expected clickthrough rate. For example, an ad with a 3 percent clickthrough rate offering a price of $2 will rank higher than one with a 2 percent click through rate offering a price of $2.50. This maximizes three key variables: customer satisfaction with the relevance of the results, ad performance for the advertiser, and ad revenue to Google. Yahoo! recently adopted a similar system with its Panama release, and reportedly saw nearly a 10 percent upswing in ad revenue as a result.

Back in 2003, Hal Varian notes, “Google was trying to figure out what to do about AdWords Select and AdWords Premium. AdWords Premium were the top two ad slots, (the above-the-search results) that were sold by a salesforce based on a cost-per-impression, reservation-based model. AdWords Select, by contrast, were the eight ads on the right-hand side that were sold by an auction model. We had a number of discussions about creating resellable reservations for the top ads which would, of course, create something like a stock market. We decided not to go that route because it would make it much harder to control the quality of the ads, potentially reducing the value of Google. Instead, we decided to sell all ads using a unified spot auction for both positions. Ads that have particularly high quality get ‘promoted’ to the top positions. This way, Google gets to control the quality of the ads. It turned out to be the right decision.”
Another approach, which derives from academic research in behavioral finance, is put to work by other firms (all outside the U.S., as this approach is illegal here). Bad traders tend to repeat their mistakes, for example doubling down when they are losing. Good traders, on the other hand, sell out their positions after a reasonable gain or a preset loss. Trading firms leveraging behavioral finance watch the behavior of individual market participants, and once they’ve learned the patterns, pass through the good traders and take the opposite side of any trade by a known bad trader.

TradeStation and Swift Trade make it clear that Wall Street firms are onto Web 2.0. Expect more innovations as financial market firms explore the power of collective intelligence. And don’t forget the Santa Fe Double Auction, which invited researchers to, as Hal Varian describes it, "contribute computer programs that would 'compete' against each other." The winning program, as described by John Rusk and his colleagues, who thought up the contest, would “wait in the background and let the others do the negotiating, but when the bid and ask get sufficiently close, jump in and steal the deal.” Hal notes that the program accomplished this “by waiting until the bid and ask came within 10 percent of the previous ask.” Because of this, he suggests, the results can be more egalitarian: “The more efficient such innovations make the market, the better the returns are to free-rider by indexing.”

Hal wrote a paper on this phenomenon, “Effect of the Internet on Financial Markets,” at http://www.ischool.berkeley.edu/~hal/Papers/brookings-paper.html. It feels very up-to-date, despite having been published nine long years ago.
kind of commission. The trading collar limits the firm’s losses, and over time, the company has figured out who the best traders are—and put them to work.

“I traded one million shares of Microsoft today,” shouts the company’s website, aiming to attract and harness skilled, focused traders from the general public in the same way that gaming platforms winnow out all but the best players. This is radical, Web 2.0 outsourcing of what was once a core company competency on Wall Street.

Why AdWords aren’t like stocks...at least not yet

If MSFT is currently worth a set value on the NASDAQ, and a keyword like “Web 2.0” is currently worth a set value on the Google AdWords exchange, does it make sense to think of AdWords and other online ad auction markets as analogous to the stock market?

We talked to Hal Varian, the Berkeley economist who is also a consultant to Google, about this idea. He doesn’t see it. “A stock is a long-lived asset that can be bought and sold,” he says. “An ad impression is a perishable commodity. In current markets, there is no way to speculate on AdWords prices. Even if you are the first to see Britney walk into the beauty shop and get her head shaved, it wouldn’t do you any good to bid keywords like ‘Britney’s haircut’ since there is no way for you to reserve or resell such words. On the other hand, you could buy the domain name ‘BritneyShears.com’ and advertise it for sale on AdWords. In fact, someone did just that. A domain name is an asset. An ad impression is not.”
But Hal acknowledges it doesn’t have to stay this way. Google, or other search engines looking for an edge, could create a reservation system that allowed for resale. This would make the AdWords market look more like the stock market.

“There is an easier way to build a speculative market around AdWords,” he says. “Just create a derivatives market based on the price of keywords. Suppose I write a contract that says, ‘On June 1, 2007, I will pay to the holder of this contract an amount equal to the then-current price of the keyword phrase ‘Britney Spears.’ This is, in principle, no different than an S&P 500 futures contract, which pays out an amount determined by the S&P spot price at a particular time in the future. AdWords futures would be a pure financial side bet, used to hedge or speculate. A paparazzo could hedge the risk that his photos would be worthless by taking an appropriate position in the AdWords futures market. You don’t need Google’s cooperation to reserve a keyword. If there is a futures market in keywords, you can buy a futures contract that will give you enough money to buy a keyword at some futures date. But if you set up a futures market for actual ad impressions, you would need Google’s cooperation, since Google would have to deliver those ad impressions on some futures date. If you set up a financial futures market on AdWords, you would just have to deliver the money to buy those ad impressions from Google.”

Such a market would behave like a future or prediction market (see Dave McClure’s related story, page 11), just like weather markets work now. Hal brings it down to a more down-to-earth commodity: eggs. He says: “The egg market behaves like the market for any other commodity, with the price being determined by demand and supply. Now think about the futures market for eggs. The futures market behaves like a speculative market. The same is true for AdWords: The current market is a spot market. But you could build a speculative market on top of it by creating assets whose value is tied to AdWords prices.” (Everyone is getting into the speculation business now: MarketWatch, an online business service owned by Dow Jones, recently launched its own community-driven forecasting tool, MarketPerception.)

Hal doesn’t necessarily want it to go this way. As implemented today, he says, ad auction markets are much closer to the ideal of the rational market than financial markets. His distinction between spot markets in physical goods and markets in financial assets is fundamental. It is not that spot markets are rational and financial markets are not. Either market can be rational or irrational. It is that rational behavior is fundamentally different in each sort of market. In the first case, demand functions are derived from the actual expected utility to
One way Web 2.0 is echoing Wall Street is in how it is responding to new areas of innovation. Scott Eblen of Library House (http://www.libraryhouse.net), a London-based data service company, says “early-stage investors are first on the scene, keen to pick up on trends before others do. We’re seeing it now with clean technology. There has been a steady rise in investment over the past year, similar to what we saw with social networking. If the pattern holds, after this happens, the media picks up, then there’s general consciousness.” And then, perhaps, a bubble.

“Unlike on Wall Street, the big guys don’t hold all the cards in Web 2.0. There’s lighter programming, cheaper startup costs. It’s easier for entrepreneurs to start something new and prove themselves. They can demonstrate value and get a committed group of customers without support of big companies.”

Scott says some recent acquisition of blogs by the sports network ESPN illuminate this. “It wouldn’t have been possible a few years ago,” he said, “back when people couldn’t do self-publishing in the same way.” But isn’t this similar to a network cherrypicking the best staff from sundry affiliates? “It’s way bigger,” he counters. “The difference is the scope they’re selecting from. If you’re looking for an anchor from small market, that’s a finite population. ESPN now can pick from hundreds of thousands of individuals. As in financial markets, quality rises to the top, as you’d expect in a market where the currency is attention and traffic.” — J.G.
An infinite number of complicated transactions

Joshua Schachter on how Wall Street and Web 2.0 differ and the inevitability of arbitrage

Joshua Schachter is a high-profile crossover artist, having done time both on Wall Street (Morgan Stanley) and Web 2.0 (he invented del.icio.us and sold it to Yahoo, where he’s now director of engineering for social search). Despite the biggest Web 2.0 company (Google) buying the most prominent online advertising agency (DoubleClick), Schachter says, “the large advertising networks don’t count as Web 2.0 because they’re hard to implement and complicated. That said, I’ve wondered what would happen when Wall Street people moved to Madison Avenue and brought their metrics with them, when they went from a world which operated on the truism that half of all advertising is worthless, you just don’t know which half, to one in which every action is moved, metered, measured. It’s a much smaller feedback loop, and it gives you information faster that you can react. It goes from something mystical to something more people can engage in, a place where the market is more understandable, more transparency, easier to access. When it’s more transparent, more people come to it, like capital markets. And when more people come to it, you get a lot more and a lot smaller transactions.”

But don’t go too far yet. “I see that in vague ways the ad market is reminiscent of Wall Street, but it’s a substantially different marketplace. Here, advertisers are customers of the market but not the target of the market. It’s more like bond markets than capital markets. The big difference is that in ad markets you have a billion keywords. Each fungible item is priced differently. There are an infinite number of things you can bid on. The stock market is more limited. When there are more things to transact in, there is less attention, transparency, and liquidity. It’s a buy-only market. I don’t see how you can short things. Buying an ad is only one part of a transaction. It’s a much more complicated model than that. There have been attempts at arbitrage, where you buy keywords in one place and try to sell them in another place, like eBay. It’s attention that is being arbitrated. You buy attention in one place, sell it in another, like an affiliate program. Ad networks sell attention, and that’s something you can buy on the other side. It’s just like any arbitrage opportunity. Arbitrage is a time-honored tradition. Why would this market be different?”

be obtained from the purchase. The demand price reflects the fact that the bidder is buying to consume. In the latter case, demand must take account of the expected demands now and in the future of all other bidders. In principle, the bidder is buying to re-sell (there is no other way to profit).

Many others we’ve talked to think Hal is dead on: The way to turn a spot market in a physical asset into a financial market is to create a derivative with a future value that can be decoupled from demand (and supply) for current consumption. One can speculate in physical markets (the Hunt Brothers went bust trying to corner silver a generation ago), but it is radically easier to do so through financial markets. Futures markets are as old as financial markets. Options have been traded on government securities in London and Amsterdam for more than 300 years. And no reader of this newsletter needs to be more than reminded of the 17th century tulip-bulb futures market.

An unorthodox history of Wall Street

Bill Janeway, former vice chairman of private equity firm Warburg Pincus and a self-identified “recovering economist,” gave us a long-term perspective that provided a useful context for consideration of possible futures for Web 2.0 markets as they aspire to the scale of financial markets. (Disclosure: Bill is also an O’Reilly board member.)

Bill points out that the price of a trade a generation ago was regulated by the exchanges: it cost approximately 22 cents per share to trade an institutional-size block of stocks on the New York Stock Exchange. The ability to fix commissions reflected the historical fact that the brokers had long been large, relative to their customers. Unable to compete on price, some firms competed on the quality of their investment research, and brokers’ relations to clients were based on the information and insights they could provide (others competed in less respectable ways).

As pension funds, mutual funds, and other institutional investors grew to dominate trading, they successfully broke the NYSE cartel. Once the exchanges no longer regulated the price of a trade, prices fell over time to current levels of a fraction of a cent per share: for large trades, effectively zero. As a result, some sell-side firms tried to charge directly for research and found that their buy-side clients were unwilling to pay. Instead, they were investing money saved from commissions to build their own research staffs. Two other things happened. Seeking an alternative subsidy for sell-side research, most firms repositioned their research staffs as marketing arms of their corporate finance firms, a strategy that blew up spectacularly with the Bubble in 2000-2002. More important,
firms began to trade against their clients for their own account, such that now, the direct investment activities of a firm like Goldman Sachs dwarfs its activities on behalf of outside customers.

Bill notes: “Now, fundamental research is a proprietary asset of (at least some) buy-side players. One may argue that the impact of IT-mediated deregulation of the capital markets has been simultaneously radically to increase transactional efficiency while, as radically, reducing informational efficiency. This is good news for long-term investors rich enough to develop their own research and to hold out against the speculative mob.”

This historical perspective provides thought-provoking fodder for speculation about the future of other networked information markets, including Google AdWords.

**Might we see search engine optimization and search engine marketing as the equivalent of Wall Street investment research?** Will SEO/SEM firms evolve into research firms, or will they start “trading for their own account”? Hal predicts that “SEO/SEM firms will be acquired by advertising firms who will then provide integrated services to their clients.” The trading-their-own-account phenomenon may be happening already. Microsoft researchers have discovered tens of thousands of pages that exist only draw search engines to their ads. It’s an elaborate and likely lucrative instance of click fraud. How will the white hats respond?

**Link farms harvest search engine results to automatically build pages that will rank high in search engine results and thus collect a disproportionate share of AdWord clicks. Might they be seen as the equivalent of program trading?**

If so, we can expect this type of programmatically created page to represent a larger and larger share of results volume unless search engines get smarter about regulating them.

**Might the direct inclusion of data, such as weather and stock prices, into search engine results pages (rather than links to external resources) be seen as the equivalent of Wall Street firms “trading for their own account”?** If so, does Wall Street suggest to us that the future of search engines is to produce increasing amounts of their own content, and to consume a greater direct share of the available clicks, rather than passing the clicks off to their external advertisers?

While these speculations are as yet unproven, we can already see some signs that they aren’t too far from the mark. Search engine marketing firms like iProspect and iCrossing are growing up into the equivalent of stock research firms. Similarly, eBay research firms like Applied Economic Research Services provide insight into the eBay marketplace to sellers. At the same time, we see other search engine marketers that are clearly “trading for their own account,”
“Web 2.0, born in a vision of openness and sharing, will end with private data pools controlled by large companies and used disproportionately for their own benefit.”

Subjects for further study

This is a rich subject, one we’ll be visiting regularly. The implications are enormous, and in the months to come we’ll be looking at the ramifications of ISPs selling clickstreams, IP securitization, the “Napsterization of sell-side research,” unexpected forecasting tools, white-hat search engine optimization, and the mysteries of the keyword pricing index. We’ll also look at what DoubleClick will do to justify the $3.1 billion cash price Google paid for it. We have some hunches—particularly since DoubleClick recently released what has been called a “NASDAQ-like advertising exchange.”

The Radar blog, http://radar.oreilly.com, and future issues of this newsletter will continue the conversation. Please write jimmy@guterman.com if you have good examples you’d like to share.

for example arbitraging low-priced keywords to bring people to pages where they are able to obtain clicks for higher-priced but little known words. The same is true on eBay, where “spelling arbitrage” allows firms to find entries that have no buyers because the poster misspelled the name of the item, repurchasing these undervalued items and reselling them via new, correctly spelled entries.

Data as the proprietary value

More thought-provoking is the trend of Google and Yahoo to provide more direct results for many common types of data. If the financial markets are any guide, we will see search engines providing direct access to many more data types over time, with search engines increasingly competing with their former customers to be the preferred target for a given search. Beware of relying on a search giant’s API for the existence of your business.

Continuing the theme that Wall Street is becoming increasingly less transparent, Bill Janeway added: “After some 300 years, the physical exchanges in which financial assets were traded are literally dissolving into thin air. Central, transparent markets are being fragmented by ‘dark pools of liquidity’ as investors seek to trade while minimizing the price impact of their trades.” That is, the big players are now big enough to create their own hidden exchanges, where they can buy and sell without telegraphing their purchases to the market.

Bill continued: “The most obvious impact of the net, of course, has been to reduce the cost of getting information and increase the efficiency of markets. In the financial markets, however, the proliferation of ‘state-contingent assets’—derivatives, whose value is a function of some more or less complex possible future state of the world—is the key new development. But, precisely because the present value of such assets is a complex function of future conditions, room for disagreement on that value is all the greater. So what we have here is not the generation of valuable, unequivocal information through network-enabled interactions, which I take to be the hallmark of Web 2.0.”

In this insight, we see a controversial but defensible projection in which Web 2.0, born in a vision of openness and sharing, will end with private data pools controlled by large companies and used disproportionately for their own benefit. Network effects driven by user participation lead to increasing returns in the size and value of the databases that are created as a result. As the Web 2.0 platform matures, we expect to see more companies capitalizing on these insights. Information may want to be free, but valuable information, it seems, is, as always, still being hoarded.
Channeling Crowds

Why the merger of social networking and prediction markets will launch a new category of tech startups.

by Dave McClure

Social networks are all the rage: You probably can’t get through a day without being invited to one. So are online prediction markets, sites that aggregate, assess, and distill group knowledge and opinion to come up with fascinating collective hunches on notable topics, ranging from sports to politics. Now the two are being mashed together, and that is driving a new category of Web 2.0 startup opportunities.

At the same time online prediction markets have been incubating, we have been witnessing a major change in the way technology startups and online services develop content and engage with their customers and communities. This new generation of startups has emphasized the social networks connecting their user communities, and enabled countless niche conversations in countless tiny—and not so tiny—verticals.

Early social network pioneers Friendster, Orkut, Ryze, and Tribe.net paved the way for eventual success and dominance by giants Facebook, MySpace, and YouTube, as well as a wide variety of other popular social networks such as Bebo, Hi5, and LinkedIn. These communities also innovated by creating new ways for members to publish their own content, and made features of their sites available via web services and widgets for others to remix and reuse.

As Web 2.0 ascended, the People Formerly Known as the Audience became both producers and consumers of their own online services and content.

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Web 2.0 feature | What it is | Examples | Impact
--- | --- | --- | ---
Ajax | Rich, snappy client-side applications | Google Maps | Makes the web feel like a desktop application
Blogging | Fast, easy webtop publishing | Blogger, Movable Type, Wordpress | People-driven media
Tags | User-driven keywords, taxonomy, categorization | del.icio.us, Flickr, YouTube | People-driven taxonomies and filtering
Ratings | User-driven reviews and filtering | Amazon, eBay, Netflix | Best content bubbles to the top
Widgets | External application components | MyBlogLog, Snap Preview | Easy distribution of features and content
Social networks | Groups and media based on shared interests | Facebook, LinkedIn, MySpace | Word-of-mouth referrals and viral marketing
Web services and APIs | Remotely accessible application infrastructure | eBay, Google, Yahoo | Standardized platforms for developing new features and applications without client software
UGC | User-generated content | Digg | Community does the work to create content

Give it to us…so we can keep it

How valuable is user-generated content? So valuable that at least one of its leading purveyors isn’t giving it away, reversing a policy. In an article in our previous issue, “People or Computers?”, we explored Last.fm’s potential for using its massive amounts of user-contributed data as a business model. Last we checked, Last.fm had the following notice posted on its site: “We will also provide periodic for data mining and research purposes, soon.” Since then, the company has removed this offer and is only providing web services. When asked why, it told its customers, the people who had supplied them the information, that the data is now “too valuable” (see http://www.last.fm/forum/21604/_/239661).

—Brady Forrest
A brief recent history of prediction:

Prediction markets are speculative markets open to public participation, created to predict future events, based on the accumulated knowledge and opinion of the people trading on the market. In a prediction market, “stocks” are created whose cash value is tied to a specific event (Will Hilary Clinton be elected U.S. president in 2008?) or numeric outcome (When will the Apple iPhone be available?). Current market price for a “stock” can be interpreted as a probability distribution or collective “bet” by the crowd as to whether an event will occur, or what an eventual numeric outcome will likely be. Under proper conditions, such markets can aggregate group knowledge and provide a reasonably accurate estimate of future events.

Prediction markets have been around for a while, with perhaps the most notable example being the Iowa Electronic Markets started in 1988 at the University of Iowa. Since its inception, this prediction market has successfully projected the winner of the US presidential race four out of five times. The Hollywood Stock Exchange, founded in 1996, is a prediction market used to gauge celebrity popularity and influence. In 2002, it successfully projected 35 of the 40 Oscar winners.

The concepts behind prediction markets were popularized by James Surowiecki’s 2004 book The Wisdom of Crowds. Lately, a number of startup companies have begun to apply prediction market technology to a wider array of disciplines: My Currency (estimating home prices), Value Investors Club (stock investments), and others. And, of course, we’ve started to see companies such as Inkling Markets (http://inkingmarkets.com), which provides software to those wanting to start their own prediction markets. —D. McC.

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Online Prediction Markets: Betting on the Long Tail

As the mix of Web 2.0 and social networks gave birth to so many micro-vertical communities that contribute and concentrate niche conversations, so will the marriage of social networks and online prediction markets enable these same vertical communities to collect and coalesce their opinions into specific predictions about the future of their community.

While this may not seem too interesting applied to the social network of your average teenager, it could be quite fascinating when applied to the social network of teenagers who are fans of a certain music genre, movie actor, or fashion trend.

- Instead of a focus group or market research on whether a new record or movie will sell, or whether a new clothing design will be popular, why not run a prediction market in the social network of people who will be the eventual customers for those products? Treat the community’s opinions as bets in a prediction market, and you’ll get useful data about your product or marketing campaign’s chance for success.

- Rather than an architect or urban planner toiling over where to locate a new sports stadium, highway exit, or civic community center, why not run a prediction market using the local community (or even a vertical community of architects and urban planners) to optimize for the best location, design, or budget?

These possibilities aren’t far down the road. The table above lists just a few examples of online prediction markets now being aimed at specific vertical communities. There may be millions of new prediction markets waiting to be born among the nooks and crannies of today’s online social networks. By focusing community into vertical categories of interest, and by providing the audience with social media tools for content production and commentary, we create a conversation. By furnishing these vertical communities with prediction market engines and tools, we let the community state its collective opinion about any discrete piece of that conversation—and thereby create a market.

Web 2.0 was all but predicted by The Cluetrain Manifesto, with the observation that markets are conversations. The marriage of prediction markets and social networks remind us that conversations are markets, too.
Open Data: From the Webcam to the Brokerage

Exhibitionism and Wall Street, it turns out, have a lot in common.

by Seth Goldstein

As *American Idol*, *YouTube*, *Twitter*, and countless other social media phenomena attest, the obvious road to celebrity is via one’s willingness to become—physically or behaviorally—naked. You’ve seen Justin of Justin.TV, who chronicles his every activity with a camera on his head. He doesn’t care about coming off as a disinterested reporter. He knows he is the story, because he is the one expressing himself most openly, across multiple networks. In addition to the live video feed and community chat, Justin makes it easy for us to connect to him via shared social networks. This is how stars enrapture their fans: Engage them in production of the very stardom they wish to worship. There is a significant difference between celebrity in the first Internet cycle and now. It is not the tools, since many of them have not changed dramatically, but a growing responsibility that more and more of us feel to express our unique, authentic selves online. Justin, like so many others, inspires us to be who we want to be.

Wall Street 2.0

So what does exhibitionism have to do with Wall Street? Traditionally, very little. Or perhaps we weren’t aware of these connections before. Now, however, the advent of personal surveillance technologies has begun to elucidate the broad applications of data that we once assumed was private and local.

Recently, Reuters CEO Tom Glocer told a story about how live data gets transformed into knowledge. He didn’t start it with his company or any other institutional input, but rather with the behavior of a individual Schwab customer who, in adjusting the stocks in her 401(k), unwittingly became a “producer” of market data. Unbeknownst to her, Schwab took her trade data, along with that of all of the other individual retail investors, and established a higher level trend. This process reverberated up through larger institutional brokers and, ultimately, exchanges. At each step up in aggregation and abstraction, significant information value was being produced.

The retail trader is the most granular actor in the price discovery machine. The question underlying Wall Street 2.0 is: How to align with the individual who is producing this surplus value? Our electronic behavior is generating value for other people who are in a position to aggregate and sell this information to institutions, which in turn transform it into some other form that gets sold back to individuals. Open data is to media what open source is to technology. Open data is an approach to content creation that explicitly recognizes the value of implicit user data. The Net is the first medium to give a voice to the attention that people pay to it. Successful open data companies, financial and otherwise, listen for and amplify the rich data that their audiences produce.

Want more, much more?

This is just a taste. A far deeper exploration of this topic is available on “Transparent Bundles,” Seth Goldstein’s blog, at http://blog.sethgoldstein.com/?p=11

Seth Goldstein

Seth Goldstein is co-founder and CEO of AttentionSoft, which creates services that turn attention into media. He co-founded the user-rights organization AttentionTrust.org. He founded Majestic Research based on the premise that rigorous analysis of online behavior would lead to better investment research. And he created Root Markets, the first financial exchange for Internet leads.

“The Net is the first medium to give a voice to the attention that people pay to it.”
Counting on Second Life

Behind the hype and argument, there are now real numbers to tell us who’s in the virtual world and what they’re doing: An O’Reilly Research study.

by Jimmy Guterman

The chart is impressive.

It shows data from the tracking service Alexa, which compares the traffic of five virtual worlds. Four of them scrape the bottom of the chart, while Linden Lab’s Second Life soars high above them. Among these virtual worlds, it’s clear which is the one to bet on.

Or is it? It’s easy to get excited about Second Life and many have, particularly in the business and technology press. Its creators have done such a masterful job, in everything from design to promotion, that the service, however worthy, has been highly hyped, most notably in mainstream business magazines.

As with so many online services, however worthy, that have been the recipients of hype, wanted or not, there has been a backlash. Clay Shirky published some skeptical and thoughtful articles about Second Life’s population or lack thereof, and the Silicon Valley gotcha blog Valleywag treats Second Life with the same hilarious derision that its sibling political gotcha blog Wonkette did with Katherine Harris during her Senate campaign. Valleywag is particularly fond of publishing screen shots from within the virtual world that question whether anyone is actually in Second Life:

What data did we analyze?

- Official data released by Linden Labs on February 2, 2007 (aggregate data only)
- Download data from Hitwise
Partly as a reaction to Shirky’s high-profile doubt about Second Life’s professed population and how much revenue, real and virtual, it was generating, Linden Lab made a great deal of data available. It wasn’t enough to satisfy the naysayers—it was aggregate data rather than individual-level, for example—but it did deliver much more information on what was actually happening inside Second Life than ever before. Armed with that information, and download data extracted from Hitwise, O’Reilly Media’s research team evaluated the numbers. What follows is my interpretation of their research.

Who’s using Second Life and what are they doing there?  
The total number of user hours in January 2007 (the last month included in Linden Lab’s initial release of data) tells a mixed story. There is great growth in the number of total hours in-game, up 348 percent from the year before, as one might expect of a service that is getting so much media attention, is enticing people to try, and is free. More telling is that the average hours per person has gone down 78 percent from January 2006 to January 2007. More people are trying the service, but they’re not staying as long.

The way to understand this is to differentiate “users” and “usage.” The number of unique visitors exploded between January 2006 and January 2007, up 1,900 percent, but the total number of hours was up, as mentioned previously, 348 percent. It’s impressive, but it means that usage is increasing at less than 25 percent of the rate of new users. Newcomers aren’t around as much.

Those who stick around are the hardcore members, of course, and that’s making the gender spread look more like the geek hangout Second Life was in the beginning. Second Life started with a typical 2-to-1 split of men and women, but began a move toward parity that peaked in mid-2005. Since then, the gap has increased: 59 percent of users were male as of January. Rather than looking more and more mainstream, as you’d expect of a service with such rapidly growing numbers of users, it looks more like a tech early-adopter demographic.

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Virtual world, real skeptic

It was Clay Shirky’s reports questioning Second Life’s population figures that raised attention about the service’s popularity, especially after they were reprinted on the Valleywag blog. For a good overview of Shirky’s work, see this January 29, 2007 post on the Many 2 Many group blog: http://many.corante.com/archives/2007/01/29/second_life_games_and_virtual_worlds.php
Where’s the money?

Linden Lab doesn’t make its money if you keep your free account and walk (or fly) around Second Life, taking in the sights. It does make its money if it converts you into a paying “resident” in the virtual world. There were just under 58,000 “premium residents” (that costs between $6 and $10 per month, depending on the plan) in January 2007, up 331 percent from January 2006. The share of paying customers is down from 38 percent in January 2005 to 3 percent in January 2007. Of course, with a larger and still growing user base, Linden Lab doesn’t need to convert such a high percentage of its residents to paying. But the trend is not positive.

The growth of the money supply in-game (using currency called “Linden Dollars”) is up 134 percent over the past year, which is notable, but that far lags behind the number of increased users. The number of Linden Dollars held per unique user is down 86 percent from January 2006 to January 2007. Transactions between residents are up, roughly the same amount as the increase in users, but such transactions per unique user are down as well.
Year-over-year increases of 300 percent-plus in total hours, premium residents, and transaction volume are dwarfed by the 1,900 percent increase in unique users, but that may be what the growth of a saturation-covered online service looks like. As O’Reilly research head Roger Magoulas puts it, “As we looked at the data, we noted the spectacular growth in users and the less spectacular but solid growth in engagement measures. A deeper looked showed some interesting twists. Hours, premium users, and transaction volumes all grew at a similar rate. The new users who do stay behave in a manner similar to the early adopters. The volume of Linden Dollar transactions per user has grown, despite the increase in users, and over the last four months other measures of economic activity per user have remained flat. These measures imply that the new users are increasingly using Second Life as a virtual economy platform.”

Roger notes that if Linden Lab is right and Second Life is a harbinger of the 3D web, not just another immersive game, over time the virtual world will depend more on what members create and how they behave. Second Life, still quite young, will need to develop a critical mass of user content and behaviors that keep people coming back. That’s a process that will take longer to unfold and is probably not comparable to traditional game adoption.

Shirky and others were explicitly questioning Second Life’s population numbers, but they were also questioning how the press was covering Second Life. The trick will be for Linden Lab to develop tools for others to develop its world and stay smarter and more patient than the hype-laden coverage that led to many to question its numbers in the first place.
You may not think a comic book can help you do your job better, but this one will. Inspiration comes from many places: other people, works of art, dreams, almost anywhere. Inspiration feeds creativity. At a time when creativity is so highly valued, it’s tempting to look around for tips.

It’s easy to get sick of books that seek to make you more creative. Some of them promise to teach you how to draw from a different side of your brain. Others maintain they’ll help you overcome your fear of being creative. Still others mix quotes from Hallmark-derived pop psychology and random Eastern philosophies in the hope that something in the hodge-podge might work. Your editor follows the advice of screenwriting theorist Robert McKee: 90 percent of even what the best writers commit to the page is worth trashing so the only way to get to that worthy 10 percent is to write and write and write. Just put down the how-to books and write it out. The work of Seymour Papert at the Massachusetts Institute of Technology is grounded in the same notion: People learn by doing. It’s no accident that his academic chair was endowed by Lego.

For executives looking to break out of whatever creative box they feel is enclosing them, far more valuable than a how-to is a book that demonstrates, celebrates, and inspires creativity. A great novel (say, Gabriel Garcia Marquez’s One Hundred Years of Solitude) or a piece of nonfiction that opens you up to rethinking basic assumptions (such as Stewart Brand’s The Clock of the Long Now, which forces the reader to consider what time is) can do the trick. If you suddenly see things in new ways, you can suddenly respond in new ways, too.

At first, Understanding Comics by Scott McCloud appears to have a modest aim: to help readers figure out how comics work. But as the book progresses, it’s clear how ambitious McCloud really is. Published independently by Kitchen Sink Press in 1993 and quickly picked up for wider distribution by HarperPerennial, Understanding Comics offers a history of art, going back to preverbal times, illuminates how audiences complete what an artist begins, muses on the different needs artists have and the rewards the derive from trying to satisfy those needs, how humans create objects that look like humans even when we’re not trying, and does this and much more with wit, delight, and style. On almost every page, there’s an insight worth putting the book down and pondering, but you won’t do it (at least you won’t the first time you read Understanding Comics), because you’re having too much fun as McCloud grabs your hand and pulls you through. You won’t want to consider where you are right now for too long because what’s around the bend seems even more exciting.
As quick a read as *Understanding Comics* can be, it’s a book that rewards those who slow down. McCloud breaks down the form to its elements and shows why iconic images are more universal and effective than photorealistic ones. He explores the spaces on the pages and forces you to realize what you’ve been reading between the panels. In doing this, the book rises to a you-have-to-stop-for-a-moment-even-if-you-don’t-want-to meditation on, as he calls it “the desire to be heard, the will to learn, and the ability to see.”

I don’t want to leave out how funny this book is. Because it is itself an instance of comics as well as being about comics, McCloud can merge form and content. He places himself in the story, even in places where he doesn’t belong, so we can accompany him through the presentation, which is full of visual and verbal jokes. His excitement is infectious and his determination to share it by cracking us up is welcome. Often his humor is inextricable from his more serious messages, particularly in a section in Chapter 7 where he seeks to do nothing less than depict the invention of art—and show how much (and how little) has changed in the half-million years since.

McCloud, a formidable purveyor of comics before he became its leading explicator, has continued with two more books in this informal series. *Reinventing Comics* came out in 2000 and, despite a whiff of dot-com overoptimism, is full of smart, provocative examinations of how art and commerce battle in the digital age (its celebration of micropublishing is particularly effective). And *Making Comics*, which came out last year, is a model of a how-to book, full of so much energy and insight that even those challenged by a drawing pencil may want to pick up one. As I write this in early April, McCloud is more than half way through a 50-state road trip—partly promoting *Making Comics*, partly because he and his family want to—which he’s chronicling, of course, on a lively blog, at http://community.livejournal.com/mccloudtour.

Not everyone is interested in reading comics. (Dismissing a whole genre is foolish, especially since Art Spiegelman’s *Maus* and Marjane Satrapi’s *Persepolis*, both comics, are among the more trenchant contemporary memoirs.) But *Understanding Comics* works even if you think comics are all subadolescent fantasies: It’s tightly structured, but the structure is so malleable that McCloud can jump anywhere he wants to, just for fun, secure there will be somewhere for him to land. Profound in spite of itself, which means profound without being pretentious, *Understanding Comics* celebrates, shows us, and tries to get to the bottom of creativity. For those millions of us who grew up on DC and Marvel, it lets us see something we’ve been staring at our whole lives in a new, deeper way.
Calendar
A selection of significant events over the next few months.

May 6–7

The New Yorker Conference/2012 (New York, NY)
newyorker.com/promo/conference
This debut conference from the venerable magazine promises “stories from the near future.”

May 9

h2.0: New Minds, New Bodies, New Identities (Cambridge, MA)
h20.media.mit.edu
The new science of human adaptability, brought to you by Oliver Sacks and the MIT Meda Lab. What is the next stage in human development?

May 19–20

Maker Faire (San Mateo, CA) www.makerfaire.com
Sponsored by O’Reilly’s Make and Craft. Come for a weekend of projects, eye-opening demonstrations, and fun. Build, craft, hack, play, make.

May 29–30

Where 2.0 (San Jose, CA) conferences.oreillynet.com/where2007
The third annual O’Reilly-sponsored conference brings together the people, projects, and issues building the new technological foundations and creating value in the location industry.

May 30–June 1

D: All Things Digital (Carlsbad, CA) d.wsj.com
Sponsored by The Wall Street Journal and hosted by Walt Mossberg and Kara Swisher.

June 1

Harvard University Conference on Internet and Society (Cambridge, MA)
cyber.law.harvard.edu/is2k7
This year’s topic: What is the role of the university in cyberspace?

June 18–20

O’Reilly Tools of Change for Publishing Conference (San Jose, CA)
conferences.oreillynet.com/toc
This debut conference intends to raise the level of technology knowledge and discourse in the publishing industry and provide a meeting ground for those leading the charge into the future of publishing.

June 20–22

Flight School (Aspen, CO) www.edventure.com
Esther Dyson doesn’t edit this newsletter anymore, but she does continue to host this conference on the startup airline market, with a focus on air taxis.
June 20–22  

Supernova 2007 (San Francisco, CA) www.supernova2007.com  
Supernova is where the superconnectors of the IT industry connect. Organized by another former Release 1.0 editor, Kevin Werbach, and produced in partnership with The Wharton School.

July 23–27  

O’Reilly Open Source Convention (Portland, OR) conferences.oreillynet.com/os2007  
More than 2,500 open source professionals together to network, learn, and share the latest knowledge regarding open source software.

August 22–24  

O’Reilly Energy Innovation Conference (San Francisco, CA) energyinnovation.com  
This debut event will investigate new technologies applied to conservation and efficiency improvements, as well as radical new tools for increasing supplies and mitigating environmental impacts.

September 17–18  

TechCrunch20 (San Francisco, CA) www.techcrunch20.com  
Michael Arrington and Jason Calacanis present “20 of the hottest new startups.”

September 24–26  

DEMOfall (San Diego, CA) www.demo.com  
Chris Shipley promises the show you the future of the technology business.

October 17–19  

Web 2.0 Summit (San Francisco, CA) www.web2summit.com  
Produced by O’Reilly, in conjunction with CMP. Come and explore the web’s edge.

October 18–21  

Pop!Tech (Camden, ME) www.poptech.org  
Over the course of three days, every part of your mind is engaged. And, if not, there’s always the lobster.

November 6–8  

Web 2.0 Expo Berlin (Berlin, Germany) www.web2expo.com/berlin  
The Expo celebrating our favorite meme goes to Europe.

November 15–16  

Web 2.0 Expo Tokyo (Tokyo, Japan) www.cmptech.jp/web2expo/eng  
After a few days off, the Web 2.0 Expo continues on to Asia.

February 27–March 1  

TED (Monterey, CA) www.ted.com  
Yes, the marquee event celebrating technology, entertainment, and design is sold out already. But you still have the better part of a year to figure out how to get in.
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