

Online Reputation Systems

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BY JEFF UBOIS

In the online world, identity alone is not enough. We encounter strangers on the Internet all the time, and who they are – even their “true names” – is hardly enough. We need to know more about people when we encounter them without history. What are they known for? Who will vouch for them? In short, we need to know their reputations.

Economically, reputation systems do three major things: They foster good behavior, they punish (over the long term) bad behavior when it occurs, and they reduce people's risk of being harmed by others' bad behavior. Oddly, they are the opposite of a traditional insurance system: Rather than sharing risks across a broad population, they assign costs directly to those who cause them. People with good reputations can charge more or pay less. People with bad reputations shape up, pay more (or earn less) or don't get to do business. (And yes, profit-seeking credit-grantors or insurers use reputation to set premiums or allocate business.) Because of all these effects, reputation systems make people more likely to engage in transactions in the first place, whether that means going out on a date or buying a sofa unseen.

Life really is not a zero-sum game. As any game theorist will tell you, games more often have positive outcomes when the players can track one another's behavior.

Indeed, reputation systems are an excellent illustration of how iterating simple rules among actors and over time can produce complex, unpredictable results. Reputation systems generally skew positive – since the systems that skew negative generally die off. (It's a lot easier to leave a bad website than to leave a bad neighborhood.) All the

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Release 1.0® (ISSN 1047-935X) is published monthly except for a combined July/August issue by EDventure Holdings Inc., 104 Fifth Avenue, New York, NY 10011-6987; 1 (212) 924-8800; fax, 1 (212) 924-0240; www.edventure.com. It covers the worlds of information technology and the Internet, including wireless communications, security, business models, online services, tracking systems, identity management and other unpredictable topics. . .and the policy issues they raise.

EDITOR: Esther Dyson
(edyson@edventure.com)

PUBLISHER: Daphne Kis
(daphne@edventure.com)

MANAGING EDITOR: Christina Koukkos
(christina@edventure.com)

CONTRIBUTING WRITERS: Eric Dean
(ecdean99@hotmail.com),
Dan Gillmor (dan@gillmor.com),
John Hagel (john@johnhagel.com),
JC Herz (jc@joysticknation.com),
Clay Shirky (clay@shirky.com),
Jeff Ubois (jeff@ubois.com)

CIRCULATION MANAGER: Beckie Jankiewicz
(beckie@edventure.com)

SYSTEMS MANAGER: Geoff Clarke
(geoff@edventure.com)

CONSULTING EDITOR: Bill Kutik
(bill@kutik.com)

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details, from the incentives for feedback to the incentives the feedback creates, matter.

There are a variety of offline parallels, starting with Santa's list, but online reputation systems – as opposed to, say, a Google search – have a specific meaning.

First, reputation systems concern people and organizations, not things. “Reputation is for actors who can change [and are responsible for their own] behavior,” says Paul Resnick, an associate professor at the University of Michigan's School of Information. “Sony has a reputation, but the Sony Vaio Model 123 has a recommendation, rating or review.” J.D. Power rates cars; while its ratings may influence the behavior of car makers, the car itself can't change in response to its rating.

Second, a reputation adheres to the person or organization and is independent of who's viewing it. That is, it's not “personalized” like My-Yahoo! or an Amazon collaborative filtering system based on your purchase patterns and those of readers with similar patterns. Nor is it a friend-of-a-friend network such as LinkedIn or Friendster. We will cover these social network systems in our November issue.

Ironically, Jeff Ubois, who wrote this issue, came to us without a formal reputation but through such a social network - through two colleagues, Clay Shirky and Jerry Michalski, via multiple links to Release 1.0/EDventure including a private e-mail list.

We know him directly now, as he wrote last April's issue on “digital garbage.” When he's not writing for us, Ubois is an analyst with Ferris Research, a San Francisco-based consulting firm specializing in e-mail and collaboration technologies. In 1998, he co-founded Omniva, which provides software that helps companies secure their e-mail. He has been reporting about Internet technologies since 1987.

– Esther Dyson

Some like to think of the Net as a digital village, but in fact it's closer to a digital city. The ability to interact with a billion people on the Net comes with its own costs: Dealing with strangers is risky, and verifying their trustworthiness is expensive – especially on a case-by-case basis.

A bigger pool of potential partners and customers implies that a larger fraction of our interactions will consist of one-time transactions. With no reason to maintain a relationship after that first encounter, trade or tirade, there is a greater temptation, ironically, for either truth or deception. Who has not heard – or told – all in a passing moment with a total stranger? (When two such strangers meet again it's often worth a movie.) In business, it's tempting for both parties to provide minimal service or even to commit fraud. Restaurants serving tourists unlikely to return usually compare poorly with those that live by repeat business.

That all changes when people can check each other's reputation in advance, and publicize the quality of any interaction afterwards. When it's understood that behavior will be made public, the desire to preserve a good reputation provides an incentive for both parties to behave honorably. As an interpreted record of past performance, reputation is no guarantee of future results, but it's frequently the best predictor of future behavior of a person or company.

In every society, and in every market, reputation matters. Historically, people have killed (or died) to protect or avenge their reputations. It's through reputation mechanisms that we choose the “best” doctor or lawyer, enlist the community to punish bad behavior, and recognize right action. Reputation systems existed long before the Internet showed up and helped them spread where they are needed most – that space between the digital village where everyone knows everyone, and the digital spotlight of fame where one particular person is “known” by everyone. Online reputation systems can give everyone a kind of “fame” (or shame) that was previously accorded only to celebrities.

The use of various online services to check a person's reputation already is becoming universal. Consummating a business agreement, hiring a new employee, or going on a date with a stranger without Googling the other party is often a failure to exercise due diligence. Declining to participate in a reputation system or to provide some kind of online presence simply places one among the “unGoogleable” – which is in itself a kind of reputation, at least in the technology world.

Word of mouth, arguably the most ancient social control mechanism on the planet, is being redefined by the Internet. The important new phenomenon is the ability to aggregate word of mouth at a global scale and at little or no cost. The most immediate impact is a tremendous change in how companies [and people] market themselves.

Chris Dellarocas
Associate Professor
Sloan School of Management, MIT

Changes to the way reputations are created, shared and revised alter the way markets operate and the way people interact online. Just as the number of online interest groups is growing, so is the number of online reputation systems. There are now reputation systems for things such as high school teachers, programmers, religious gurus, lawyers, journalists, resort hotel operators and charities, to name a few (SEE CHART, PAGE 31).

Companies can use reputation systems to enhance customer support while reducing its costs, and to establish trust, thereby increasing the number and quality of transactions. EBay's feedback forum, which is used by millions of people for millions of transactions every day, is a good example. According to a study of eBay's reputation system by Paul Resnick, an associate professor at the University of Michigan's School of Information, highly ranked sellers can charge about 8 percent more than sellers with no reputation, for identical items.

Other companies operate online reputation systems as their core business, and generally follow models similar to credit-reporting agencies (i.e. database publishing) or ad-supported publishing. . And finally, some reputation systems exist to enhance the social agenda of their creators, such as RateMyTeachers.com or Slashdot.

On the other hand, reputation systems aren't generally offered by governments, which are (or should be) constrained by accountability and due process. The whole point of a reputation system is to reflect public opinion, and people may well be judged guilty without proof. That's fine to provide a warning, but it's not something a government should be doing. For example, government sex-offender databases are not reputation systems of the kind we cover here, since they reflect legal outcomes rather than user-driven or peer-to-peer reputations. Probably the closest a government could or should come is to publish something such as NetScan (SEE PAGE 25), which offers transparency about user behavior and lets users see other users' implicit reactions to participants.

What Makes a Reputation System

While online forums have been in use since the 1970s, and search engines have made it easy to find unstructured commentary, the reputation systems we cover here deal in explicit data that is collected deliberately and presented consistently, usually quantitatively.

Reputation systems differ in the way they address key issues of design and purpose. In essence, they attempt to produce objective information by managing incentives to participate and by putting subjective information through quality-control measures that act as checks and balances on individual biases. Among the factors are:

- **Participants.** Who's rating whom? Is the system customer-about-buyer, or peer-to-peer? Do the raters have reputations themselves? Are the raters known or anonymous?
- **Incentives.** Are the participants explicitly taking part in a reputation system, or are they performing "normal" tasks such as writing a newspaper article or offering advice in a Usenet group? Does the producer of the data have an ax to grind?
- **Criteria.** What issues matter to the users? Do they care about prompt shipping or about product quality? Good spelling or accurate information? Bedside manner or medical outcomes? That is, what factors go into calculating a reputation: numeric feedback from counterparts to a transaction, observed behavior, seals and credentials, press coverage, etc.?
- **Access and recourse.** Who gets to see the data, and who gets to change it? Who gets to know about that change? Who knows about who has rated whom? Can someone respond to a reputation he is assigned? Can an opinion be corroborated?
- **Presentation and tools.** Offline, reputation is rich and nuanced: People can use all five senses to determine reputation. (Is the person wearing an Armani suit or shabby clothes? Is the political candidate making eye contact and speaking clearly, or mumbling and reading from notes?) Online, users can only see and interact with data points. With what tools can users interact with and filter data? To what extent is the data abstracted or aggregated?

BOZOFILTERING IN THE WELL

But reputation systems needn't be quite that formal. Take the WELL, for example, one of the longest-lived and most visible online communities. The WELL didn't offer an explicit reputation system for its users, but they came up with one for themselves: a feature called bozo filtering. Lots of services allow you to filter out the posts of people you don't want to read; the WELL - with a tool developed by users - allows users to publish their .blists (for bozo list). Another user tool generates the stats: who is most filtered, who filters most people, and so forth. The updates

are noted, too: Who has annoyed or bored lots of people or suddenly regained favor? Who has lost patience and decided to filter all his former friends?

Says WELL founder Stewart Brand: "I don't know if it's part of the WELL's success or just part of its peculiarity; it reeks of WELLness. I'm proud to be associated with a system that has bozo filters, and that makes them public." But he adds, "The main reputation system at the WELL, of course, is the one I insisted on at the start: NO anonymity. That definitely was part of its success."

In the end, these choices shift the balance of power between buyers and sellers (or givers and takers) in complex ways. Some reputation systems are designed as explicit attempts at changing behavior, making teachers accountable or markets more fair and therefore more attractive. Buyers can evaluate sellers on multiple dimensions other than price. Sellers may find the payoff from a sale is extended over time by the permanent record in the system. Vendor-sponsored reputation systems help users complete transactions by enhancing confidence, steering people to good partners or away from bad ones. (EBay may strike some people as a slightly antiseptic place; indeed, it effectively marginalizes the sleazy actors.)

This isn't a new concept: It has been possible to see peer rankings of lawyers in the Martindale-Hubbell directory for decades, which tend to be sanitized by "professional courtesy" - and the tendency of lawyers to sue. The Net, however, has made it easy to gather reputation data not just from peers or authorities once a year, but from everyone all the time, and to make the results accessible to the world.

Context also matters. It's easier for people to "be anywhere" online, whereas in real life you instinctively trust, say, the people you meet in the Admirals Club and ask them to guard your pc while you wash your hands or check out the fruit and crackers. (You may be wrong to do so, but that's another matter.) In a store, you have some sense of whether the store has been around for a while, and you also assume that the clerks or security guards are keeping a watch on things. In your neighborhood, you see the same faces, even if you don't know who they are, and you recognize strangers for what they are - interlopers with no reputation.

A successful reputation system needs to eliminate or account for the nature of human judgment - and human biases. In the end, reputation system design reflects a social agenda and set of beliefs about human nature. Giving new power to those beliefs has surprising consequences.

Bad rap for reputation systems?

As with any tool, the effects of reputation systems can be mixed. The value of increased trust and cooperation provided by reputation systems is real, but so are the some of the potential negative consequences of persistent, inescapable surveillance, and the continuous erosion of private space.

The inevitable errors in reputation systems will have unfortunate consequences for “good” people who are mislabeled, or who find themselves dealing with “bad” people who have good reputations. Sometimes, those errors result from intentional mislabeling: competitors out to damage each other’s reputations, con artists out to make themselves seem trustworthy, or mediocre workers in search of a better job.

But other “errors” are less concrete. People may behave differently in different circumstances and to different people; a reputation is only what some people might think, not a hard truth.

Finally, good reputations are valuable. In the offline world, identities are usually stolen to make use of a good reputation for financial gain. It is difficult to steal a social rather than a financial identity in the physical world, and the practice is unusual enough to underlie tales such as “The Return of Martin Guerre” or “Catch Me If You Can.” (Assuming a new, reputationless identity is easier and much more common.) But online, a social reputation is easier to steal - in games or chat rooms, for example - and can provide emotional or psychological satisfaction to some people. (We leave the rest to your imagination.)

Identity matters

Underlying any successful reputation system must be an identity infrastructure. “Identity is the lynchpin of association; it’s the key that gets me unique information about your history,” say Microsoft’s research sociologist, Marc Smith. “You can make an analogy to a database, in which identity is the key or pointer, and the reputation is the record. Knowing your identity gets me unique information about your history.”

Online identity exists on a spectrum ranging from completely anonymous, to persistently pseudonymous, to authenticatable identity: provable, real-world name, address, and other identifying data. You can also have a reputation (a credential) without a distinct identity, which happens more often in the real world: Everyone you meet in the Decathlon Club, for example, is either a member or a friend of a

member. Everyone at the wedding is linked to either the bride or the groom. A person holding a \$100 bill is financially capable.

The identity policies of an online reputation system affect how that system will function and what purposes it can serve. When non-cash money or tangible goods change hands, both parties usually know the other’s identity or at least have some context. Sometimes the real names of the buyer and seller are revealed only when both parties have agreed to a transaction, as on eBay. Reputation systems that operate based on the true name of all parties tend to recognize and account for positive contributions by particular people, which helps identify “angels.” But that same transparency fosters a fear of retaliation that discourages public naming of other shortcomings making these systems less useful for avoiding bad actors.

Sometimes sources (or raters) are allowed to retain their privacy, but make public comments on identified targets, as on Travelocity, where identifiable hotels are rated by pseudonymous guests. In other circumstances, as on RateMyTeachers, providing privacy protection may be necessary to get sources to provide any data at all. Finally, in systems such as NetScan the reputations are derived from the behavior of mostly unknown or pseudonymous actors.

	SOURCE (RATER) IS KNOWN	SOURCE (RATER) IS ANONYMOUS
TARGET IS UNKNOWN	<ul style="list-style-type: none"> Someone in the Decathlon Club 	<ul style="list-style-type: none"> Someone holding cash
TARGET IS PSEUDONYMOUS	<ul style="list-style-type: none"> Discussion groups such as NetScan 	<ul style="list-style-type: none"> Brokered markets P2P networks Black markets
TARGET IS KNOWN	<ul style="list-style-type: none"> Social accounting systems Some merchant reputation systems eBay (post-transaction) 	<ul style="list-style-type: none"> RateMyTeachers Shopping.com “whistleblower” sites

The identity structure and policies of a reputation system affect how that system will function and what purposes it can serve.

While it's possible to build effective reputation systems that incorporate some degree of anonymity for the raters, anonymity also opens the door to variety of troubles. It can make it harder to trust the data put into a reputation system, since it may be provided by a malicious actor. It also makes it harder to stop bad behavior, because bad actors can re-appear with new identities or create multiple versions of themselves. "The problem is that reputation systems are intrinsically linked to identity and authentication, [which] are non-trivial, technologically, and socially," says Slashdot creator/director Rob Malda. "Slashdot has little way to encourage a user to retain an ID."

So why fool with anonymity? The short answer is that it can improve the quality and honesty of data collected. Reputation systems in which both parties are identifiable skew towards positive ratings, which may be fine for systems designed to identify good participants, but they may fail to surface and resolve complaints.

Some reputation-system designers have tried to solve the inherent problems of anonymity technically, such as by watching for a single IP address that is originating multiple IDs and system entries. (Both eBay and Ratemyteachers do this).

A more interesting approach is to adjust the overall economics of the reputation system to give more value to established reputations, and make them harder and more expensive to earn. As reputations become more valuable, users have incentive to remain in good standing – or at least they have to act "good" longer to get a good reputation. They may not bother to earn a good reputation at all, or they may discover the benefits of being good and stay that way. (Or they may go really wild when they finally blow their cover and act badly.) Online games that require hours of patient work to create a character with a certain level of skill are an example of this.

Makers of Markets: Driving Transactions

The most famous reputation system of all is actually ancillary to its sponsor's basic business: eBay uses its reputation system as a tool to raise users' confidence in its service and to raise the actual quality of the service by driving out bad actors and encouraging the rest to be good. Epinions uses some of the same techniques to raise buyer's confidence in the reliability of the information/reviews it publishes about products. In both cases, the reputation system indirectly encourages users to engage in transactions and increases the sponsors' business and ultimately profits.

Ebay's system is peer-to-peer, in the sense that buyers and sellers rate one another. By contrast, Epinions hosts a platform in which reviewers rate products and the reputation system, which rates reviewers, raises the quality of and trust in the reviews. Customers have a better understanding of the products they are buying and thus buy with greater confidence and are more likely to get what they were expecting.

Reputation systems work best when most people participate and contribute what they know, but that presents reputation system designers with a trade-off. One reason eBay achieves high participation rates is that it doesn't ask for much: just a positive or negative rating and maybe a comment.

Other systems convince a smaller percentage of people to contribute more detailed information. Tapping the tiny minority of people willing to produce large volumes of good content is critical to reviews at Amazon and Yahoo! as well as Epinions.

When those raters are the subject of a reputation system rather than paid reviewers, interesting things happen: Individuals compete for status by producing increasing numbers of high-quality reviews, as at Epinions. For example, Harriet Klausner once was an acquisitions librarian in Pennsylvania; today, she is Amazon's number-one-ranked reviewer, based on votes from readers of her reviews. She has written 5561 book reviews for the site – without being paid for her services.

eBay: People are basically good

"People are basically good" is an article of faith at eBay, printed on the back of each employee's ID badge. And in a sense, the company has the data to prove it: More than 99 percent of the transactions completed on eBay result in a positive rating for both buyer and seller, and only about 1 in 40,000 auctions ends in fraud. "The system enables people who don't know each other to trust each other enough to exchange goods they can't see until transactions are completed," says Brian Burke, senior manager for rules & marketplace policy, who with Amjad Hanif, senior product manager, is primarily responsible for maintaining and improving the feedback system.

It appears its feedback system has evolved into something surprisingly robust, fostering good behavior on a scale unprecedented in the real world. How much everyone is really happy, and how much the system *forces* "happiness," is unclear, but it *is* clear that the eBay world is a trusting one. eBay is perhaps the online world's best argument for transparency. And its own reputation is such that its very name adds credi-

bility to “eBay inside” companies such as AuctionDrop that resell goods on eBay for individuals who are too busy to trade themselves.

While the feedback system may provide peace of mind for eBay users and keep most people relatively honest, the primary economic beneficiary of the system is eBay itself. In fostering trust in the overall marketplace, not just in individual participants, the feedback system drives transactions and provides resistance to serious competition either from other markets or from circles of frequent traders going offline (although of course that happens). The system has reduced user hesitancy about trading on the system by lowering the cost of verifying trustworthiness, and eliminated the one-time aspect of the transactions. A new user may not have a relationship with each individual, but eBay does, and that trust is largely transferable.

eBay’s feedback system was developed in 1996 by founder Pierre Omidyar, who now sits on the board of the Santa Fe Institute, an organization that studies how simple rules iterate to create robust, complex systems. The feedback system has 1.3 billion comments on file, with 2 million more being added every day. Though the basic system appears extraordinarily simple to users, it comprises a complex web of competing interests and priorities resolved through a mix of technical solutions, usage policies and social custom.

The two guiding principles in the feedback system’s design are reciprocity and transparency: Trading partners can rate each other; in fact, it’s expected. And it’s possible for anyone viewing a rating to know something about the person who provided it, to contact him for clarification, to read the ratings he received from others, and to judge whether he is likely to be a source of valid information. And of course the person rated can also see that information and can respond to his own ratings.

The culture of reciprocity is key to getting users to provide feedback. It is also key to the positive-sum game: Trading partners tend to mirror the feedback they receive from each other, and courtesy feedback is a social norm. “When you participate [by rating someone] you likely will improve your own reputation at the same time, and that is a huge incentive,” Hanif says. As a result, more than 50 percent of transactions between new trading partners generate feedback.

With a diverse base of users ranging from Fortune 500 companies such as Dell and Disney, to dedicated buyers of high-ticket items or distressed merchandise, to individuals making their first transaction, one of eBay’s biggest design challenges is balancing complexity and ease of use.

SQUARETRADE

Another mechanism for establishing reputation and trust comes from a company called SquareTrade, which provides a seal of approval for qualified participants who promise to abide by the decisions of its online dispute resolution service. (DISCLOSURE: ESTHER DYSON IS AN INVESTOR) Users who want to improve their reputation online can pay for SquareTrade's seal and its services, which is rather like posting a bond or using a third party to provide some type of assurance. It's a kind of branding on the cheap. . .as long as you deserve it.

Though the seal is essentially a binary rating, even simpler than eBay's -1, 0, +1 scheme, it also carries a guarantee of satisfaction. Thus SquareTrade addresses the problem of marginally unhappy users unable or unwilling to post negative feedback. "Most disappointment online is on the fringe, not outright fraud," says Square-Trade founder and CEO Steve Abernethy. "Something didn't arrive on

time, or is a little different than reported."

SquareTrade's online dispute resolution system allows people reach a satisfactory resolution without consulting a human mediator by walking them through common misunderstandings and helping them to find a common compromise. In effect, the system tells disappointed buyers and sellers: "Most people with this complaint resolved it this way," and offers remedies such as return of the item with the shipment paid, payment of a repair bill, or a replacement item.

Interestingly, one of the common disputes is over eBay feedback (a key feature of SquareTrade's seal program is instant notification of negative feedback). People unhappy with merchants who display the seal can use SquareTrade before leaving negative feedback, and people who have received negative feedback can ask SquareTrade to resolve the dispute to get the feedback removed.

The company has opted for a relatively simple system – people are rated –1, 0 or 1. While the summation of many ratings creates additional precision, as do the 80-character comments allowed with each rating, the company has resisted the temptation to move to a ten-point scale or to allow ratings on different aspects of a trader or transaction, in order to keep the noise level to a minimum.

Limiting the scope of what is collected has improved other aspects of the system as well. When the system launched in 1996, users could rate each other not only on transactions, but for any reason. Participants on message boards thus gained favorable (or unfavorable) ratings based on postings that didn't directly reflect their trading partners' experience. Competitors sometimes gave negative ratings to one another. As a result, about a year after the site launched the company decided to restrict ratings to completed transactions only, which Burke and Hanif say reduced ratings inflation in both directions.

eBay also limited ratings to one between each pair of trading partners, rather than one per transaction. While this has prevented collusion among small groups of people intent on gaining high scores, it has been disadvantageous for those who trade within a limited circle and want to branch out.

Was it good for you, too?

As mentioned earlier, the feedback system skews positive. Again, this is partially driven by reciprocity: Juan is unlikely to give Alice a bad rating because he doesn't want a negative rating back. And because positive feedback has value in driving future

transactions, it is sometimes used as a negotiable item in current transactions: The threat of negative feedback may be used to extract additional concessions, such as faster shipping. Over the long run, however, these dynamics drive low-reputation people off the system and enhance the reputations of those who stay. (If Alice had such a bad reputation that her negative opinion of Juan wouldn't count, he probably wouldn't trade with her in the first place.) It all fits in with the ethos that people are basically good.

Yet, Hanif points out, "Feedback is a very personal experience. It is two members rating each other, and brings all the complexities of human interaction, including the emotions and misunderstandings. Everyone remembers who gave them their first negative feedback and why." Burke adds, "No one likes being criticized, yet the reality is no one is 100 percent perfect."

"We have a lot of big retailers that sell on the site, and their first experiences were eye-opening," Hanif continues. "In retail, if you have a disgruntled customer, no one knows. On eBay, it's quick for the whole community to find out what they are doing."

Power seduces the powerless (into being nice to the powerful)

All this points to what is perhaps the most serious challenge: ensuring that members provide accurate data. Unlike most online reputation systems, feedback on eBay gets recorded only when auctions are completed and eBay gets paid. Developing a reputation costs money, and that discourages efforts to game the system just for sport.

Reciprocity is surprisingly double-edged in its effects on rating accuracy. As mentioned earlier, it acts as a brake on unfair negative ratings: Traders can "punish" what they regard as unfair negative feedback by providing negative feedback on their trading partner. This system provides an incentive for users to resolve disputes before publicly posting feedback – a service that has become the core business of SquareTrade. (SEE BOX, PREVIOUS PAGE.)

EBAY INFO
Headquarters: San Jose, CA
Founded: September 1995
Employees: 4000+
Key metrics: \$508.6 million in profits on \$1.2 billion in revenues; \$22 billion in gross merchandise sales among 75 million registered members
URL: www.ebay.com

On the other hand, fear of retaliation and the desire for positive feedback may lead users to refrain from complaining even when it is warranted. In effect, users are sometimes forced to choose between acting in their own interest (e.g. providing positive feedback to a marginally bad trading partner to get a positive rating in return) and that of the overall community (e.g. warning the community but suffering retaliatory negative feedback).

To some extent, this reflects another tension – between users and eBay itself. For eBay, part of the goal is to create an atmosphere of trust. Outing the serious con artists is helpful to the overall system; noting every minor gripe is not. “Only one in 200 transactions gets a negative feedback,” Resnick says. “It’s likely that more people are mildly unhappy, so it seems useful info is getting lost.”

This inclination to emphasize trust manifests itself in the presentation of ratings as well. “eBay does not let you search or sort through feedback ratings,” says Brian Dear, the founding director of eBay Design Labs and now working on a startup still in stealth mode. “All you can do is page through the feedback ratings sequentially. One consequence: after slogging through page after page of positive ratings looking for those curious negatives, all that positivity erodes your desire to keep looking.”

Not all the efforts to maintain data integrity are based within the feedback forum. In particular, eBay’s identity system, which contains full names, addresses, and credit information, is key to fraud detection and prevention. eBay watches for people who are rating themselves and for collusion among groups by monitoring incoming IP connections and suspicious patterns of buying and bidding behavior such as sudden increases in average transaction values.

It’s worth noting that Alice’s perceived reputation is also based on other public information, such as how long she has been on the system, what kind of good she is selling, how she presents the items she has for sale, and how she responds to questions. Of course, these inexplicit cues that people use to form opinions about a person’s reputation aren’t always reliable either: Serial murderer Ted Bundy used his supposed good looks to gain the trust of his victims.

Epinions: A web of trust

Founded in May of 1999 by Nirav Tolia and four others from Yahoo!, Netscape and Excite@Home, and launched with \$8 million in funding from Benchmark Capital and August Capital, Epinions was one of the early efforts to aggregate word of mouth among shoppers on the Internet (SEE **RELEASE 1.0**, MARCH 2001).

“We took our inspiration from Amazon for its user experience and user-generated content, and from eBay as the best marketplace,” Tolia says. “We wanted people to rate the reviews and the reviewers, and to build a marketplace for content.”

The company received \$45 million in VC funding before being acquired in March 2003 by Shopping.com (formerly DealTime), a New York-based price-comparison service. "Shopping.com offered pricing information, Epinions specialized in reviews, and people want both," Tolia says. "Shopping.com is about where to buy things; Epinions is about what to buy [and whom to trust]."

Users trust the information on the system because products, reviews and reviewers are all rated, Tolia says. Some users write reviews of the products. They and other users can then choose to add reviewers to their personal Web of Trust by reading their reviews, checking out their profile pages and evaluating the reviewers' Webs of Trust. The more people who trust a reviewer (and, in turn, the more people who trust the person who trusts a reviewer) the greater his trust ranking and the more likely he will be chosen by Epinions as an "Advisor." "We built a huge transitive web of trust that gives users access to the work a lot of people have done," Tolia says.

For Shopping.com, the merger with Epinions has helped the company provide customers with unbiased information they need to make buying decisions about what, not just where, and, says Epinions founder Nirav Tolia, to "humanize" what is otherwise a commodity service. "It's the only real differentiator," he says. "Before the merger, we considered syndicating our content, but we realized we could bring more value to a single partner." Shopping.com powers other shopping sites such as Earthlink and Excite, but it syndicates its merchant relationships and Epinions content only as part of a total package.

Tolia suggests merchants such as Sony could benefit by referencing Epinions reviews as well. "Using Epinions reviews won't muddle their brand, and their customers won't feel like 'these guys are trying to sell me,'" he says. And because disputes are not always the fault of the merchant, Epinions provides the benefit of a feedback mechanism to allow sellers to challenge negative reviews.

Today, the company collects about 500 reviews of products, merchants and reviewers from 300,000 to 400,000 unique visitors per day, and more than 1 million product reviews are available on the site. Total transaction volume in 2002 at Shopping.com topped \$1 billion, making it the fourth-largest shopping site on the Net, after eBay, Amazon, and Yahoo!. Of the \$38 million in pro-forma revenues generated by Shopping.com, \$8 million is directly attributable to Epinions, says Tolia. Nearly all of

EPINIONS INFO
Headquarters: Brisbane, CA
Founded: May 1999
Employees: 35
Funding: owned by Shopping.com
Key metric: \$8 million in revenues in 2002
URL: www.epinions.com

this revenue is paid by merchants on a cost-per-click basis, though the company has a few revenue-sharing arrangements.

To manage the flow of reviews, three Epinions employees work with 32 independent and mostly unpaid “category leaders,” who in turn help supervise 300 to 400 community leaders known as top reviewers or advisors. Category leaders don’t necessarily write lots of reviews themselves; their role is to encourage reviewers/advisors and to ensure overall quality.

“You have to make a self-organizing system, and the keys to that are structure and feedback,” Tolia says. “People need a structure so they know what you expect from them, and then you need feedback because the only way to manage that much output is to have it manage itself.”

Key to the system’s effectiveness is providing incentives to visitors to write high-quality, but not necessarily positive, reviews. Initially, the company paid writers 30 cents per page view, which was not only expensive but encouraged quantity over quality.

In 2002, financial considerations forced the company to adopt a new payment structure for reviewers. The company uses a complex algorithm to calculate a dollar value for users’ “shopping” and ratings in a particular category – i.e. reading several reviews on a given model of toaster oven, setting up comparison panels to compare like models, etc. That amount is then split among reviewers in that category.

While the payment system bears similarities to pooled tips for waitstaff in a restaurant, the incentive to provide good “service” does not: Epinions discovered that many of the best reviewers weren’t doing it for the money. “People were getting intrinsic satisfaction out of sharing their opinions and getting feedback,” says Alexis Johnson, Epinions’ community product manager. “Many of our reviewers indicate they aren’t writing for the money by donating their earnings straight to charity.”

The new payment system also encourages both positive and negative reviews. “We want to make sure we are incenting people to be impartial,” Johnson says. “Our readers love negative reviews. Frequently, they will search by star ratings and read [only] the one-star items.” This makes sense: After filtering out the lemons, users make choices based on price, features and availability.

Interestingly, while the reviewers are willing to give thumbs up or thumbs down on products, they are highly sensitive to negative feedback themselves. “There’s an

unwritten rule: Never give negative feedback without explaining why,” Johnson says. “There are people who hate each other over that kind of thing.”

And this leads to a potential weakness in the system. The reputation of reviewers doesn’t necessarily map to the quality of reviews.

“When we first started there was this belief if you allowed people to trust each other, they would be rational about whom they trust and why. The people with the best ideas and writing would have the most people who trusted them and would filter to the top. But that assumption wasn’t correct,” Johnson says.

“Sometimes, the one who has gained most trust is the guy who has asked people to trust him, or is the funniest or the sweetest,” Johnson says. “You can also have great writers who don’t play the community game: They want to write reviews and leave, and since they are not actively involved they don’t get noticed and trusted.”

For now, Shopping.com is living with this, and considers it a reflection of the way things work in the rest of the world: Influence doesn’t always map to competence.

At the same time, the company is careful to avoid cheaters. It relies on its army of reviewers and editors and the sheer accumulation of commentary to prevent manufacturers, merchants and reviewers from gaming the system. “Unless you are the manufacturer of the product, there is very little reason to cheat, but we have some automated things, like IP logging and cookies, that help us identify people who are submitting false reviews,” Johnson says.

Imitation is the sincerest form of reputation enhancement

For other vendors thinking about building their own reputation-based rating systems, Johnson emphasizes the importance of Epinion’s early decision to pursue writers who had posted high-quality reviews on Usenet and other sites. “We launched with 2000 high-quality reviewers. Handpicking the people to start the community was really important,” Johnson says. “You have to choose the leaders before you open the doors.” Call Usenet and other sites farm teams for the commercial enterprises.

Reputation, like identity, is by its nature ambiguous, and that is a feature, not a bug. Computers are good at drawing sharp but not fuzzy distinctions; explicitly defining who is a friend can kill relationships.

*Cory Doctorow
Outreach Coordinator
Electronic Frontier Foundation*

It's also necessary to find ways to separate users into subgroups. Within Epinions, three relationships are possible: Users can trust a particular reviewer, ignore him, or put him in a killfile so they won't even see his comments or reviews. The default is to see only reviewers that have not been blocked by much of community. If a user registers and signs in, he can set his own filters and preferences. These filters allow different and diverse communities to co-exist within the site: If you don't want to see certain people, you don't have to.

Watch Out: They're Watching You

Another business model for reputation systems is simply publishing the information, with revenues generated either directly from the users of the information or from advertising. These reputation systems aren't peer-to-peer, but rather focus on collecting reports from one community about individuals or organizations in another community – buyers and sellers, typically.

Most individuals already have a financial reputation lodged in the databases of Experian, Equifax and TransUnion. As with other reputation systems, these services function in part to establish trust and reduce risk by providing predictive information about a buyer's or borrower's ability to pay. For consumers, they have changed everything from how mortgages are issued, to how automobiles are leased, to how home rental applications are evaluated. Similar systems from Equifax and Dun & Bradstreet exist to evaluate the credit risk of companies: Do they pay on time? How big are they? Based on that information, sellers can decide what terms to offer.

Credit is much more available in economies with such systems than in newer "free" markets such as those in Eastern Europe, where companies are loath to extend credit to unknown consumers or small businesses.

But until recently, these systems didn't do much to influence user behavior. Since the information was available only to paying customers, the individuals and companies rated often didn't even know what their ratings were and couldn't adjust their behavior in response. Now, consumers can get easier access to their own ratings, the result both of legislation and of the the distribution economies of the Web.

Internet-based reputation systems confront users with their reputation, which causes people to adjust their practices. That's been true at OpenRatings, which turn the old

credit-scoring model around by gathering the same sort of data about suppliers, and selling it to the suppliers' customers (as well as to the suppliers about themselves).

And finally, new tools such as Overture and Google AdSense make it easier to fund reputation systems through advertising by matching the market and the advertisers. Information-sharing sites such as Slashdot take advantage of this model.

Slashdot: Working for Whuffie

Awarding recognition is a powerful way to inspire individual contribution to group projects, and the desire to astonish friends has always been a powerful force in any creative community. That's particularly true in the technology-developers' community, which in large part is driven by "Egoboo" (a term popularized by Eric Raymond), "Whuffie" (popularized by Cory Doctorow) or "Karma" (from Slashdot itself), all terms used to describe the combination of psychic satisfaction and social credit, or "reputation capital," that result from building something of value and being recognized by peers.

Several sites have built systems to track reputation in the technical community. By far the biggest and busiest of these is Slashdot, a website on which members can post and comment on stories and developments of mutual interest. Participants gain Karma, or reputations, based on the quality of their contribution to discussions.

Slashdot's Karma is measured as Terrible, Bad, Neutral, Positive, Good or Excellent. It is used to identify users who abuse the system, to distribute the work of moderating discussions, and to float "good" postings to the top. "We use it as a defensive mechanism to prevent flooding, denial of service and patterned abuse," says Slashdot creator/director Rob Malda. "Our fundamental goal is to allow readers to decide how much time they want to spend on any given story. If a reader wants to see only five comments, we want to make sure they get five decent comments."

Users with good Karma can speak a little louder. They may also be awarded moderator access, which allows them to judge a limited number of posts by other users. Finally, moderators themselves are judged by "meta moderators," groups of five (randomly chosen, Karmically qualified) users.

The function and purpose of the reputation system have evolved over time. "I didn't have anything lofty planned at the start. I just needed to clean up the forums when trolls flooded them and interfered with my ability to read the site," Malda says.

Slashdot's users, however, have come to equate Karma with prestige, and that makes all the difference in how they behave. Malda notes that ratings were initially known as total mods, and largely ignored until he changed the name to Karma, mostly because it was humorous: "It was my lesson in the importance of naming:

[Suddenly] people [were] abusing Karma left and right, gaming the system to the point where they had no accountability."

SLASHDOT INFO
Headquarters: Ann Arbor, MI
Founded: September 1997
Employees: 10
Funding: acquired by the Open Source Development Network
Key metric: ~ 10,000 posts and 400,000 readers per day
URL: www.slashdot.org

Of course, this particular community is partially defined by its members' love of breaking stuff to see how it works. As a result, Malda is looking at several approaches to limiting the impact of hackers cracking. "I want the system to have ever better memory of what has happened historically, so that the effects of moderation can be scaled depending on all available data," Malda says.

In particular, Malda is exploring ways to derive ratings from technical data, somewhat like NetScan (SEE PAGE 25). For instance, a post from an IP address from a subnet with a history of bad posts might be given a negative rating by default, rather than the normal positive rating for posts by registered users. "Right now we make little use of tons of data that could help us such as time span between post and moderation, the user's posting history, and the subnet posting history," he says. "There are probably 100 subnets with 5 percent of our traffic and 90 percent of our crap."

Slashdot is also operating a web of trust system, called the Zoo, that lets users identify friends, foes, friends of friends, and foes of friends. Users can trust input from friends and friends of friends, and block data from users they don't respect. "We don't yet use the data for much beyond novelty, and simple things like killfiles, but I would like to see a true [vouching] system where I stake my [reputation] against the future posts of another person," Malda says.

RateMyTeachers.com: Who grades whom?

Educational reformers have argued for years that merit pay (based on accurate assessment) could improve school performance. Though teachers routinely grade their students, it's only recently that large-scale, public systems for grading teachers and professors have come online.

The anonymous nature of many of the participants in this system makes it harder to trust their results, but for those of you with kids in middle school or high school, we

suggest you ask them how well RateMyTeachers.com performs. (Other readers may want to check out (or perhaps create) the hypothetical RateMyBoss.com or even RateMyVC.com.)

“Students are always talking about their teachers, but it has never been organized and collected like this before,” says Michael Hussey, co-founder of RateMyTeachers, which hosts nearly 3 million mostly anonymous reviews of more than 400,000 teachers in more than 24,000 schools and school districts in the US and Canada. Previously, Hussey founded infiniteMEDIUM, which created a number of other ratings sites including RateMyPet, RateMyWheels and RateMyRecipe. He developed his first rating site, RateMyFace, when he was studying financial economics at the University of Maine in 1999.

Currently self-funded and supported by ad revenue, the company was founded in April 2001 as a partnership between Hussey, MisterMessage (which developed other RateMyX sites, but now focuses on RateMyTeachers), and John Swapcienski, the owner of RateMyProfessors, a similar service focused on university professors.

“We want to improve education, and that means recognizing the bad teachers and praising the top teachers,” says Hussey. But clearly, there is more to it than that. To the extent these services function as whistle-blowing systems, they must offer public anonymity for reviewers in order to be effective. Yet that presents its own set of problems. While proponents see these systems as a method of safely speaking truth to (or about) power, anonymity also provides a haven for spiteful, vengeful underperformers to unfairly tarnish the reputations of teachers they don’t like.

Hussey has received several threats of lawsuits, and more than 150 schools and school districts have restricted access to the site. In Winnipeg, Manitoba, education officials made a concerted effort to track down and punish students who had posted reviews.

Given the anonymous nature of the postings, ensuring the quality and fairness of the reviews on the site is a challenge. Hussey notes that more than 1600 volunteers are engaged in checking the 10,000 reviews that are added to the site every day, and that the company is actively recruiting “administrators” to monitor the postings about teachers at every school in its database. On the back end, the site watches for multiple entries from the same source or IP address.

RATEMYTEACHERS INFO
Headquarters: Bakersfield, CA
Founded: April 2001
Employees: 7
Funding: self-funded for about \$35,000
Key metric: 400,000 teachers rated in 24,000 schools
URL: www.ratemyteachers.com

Hussey adds that a number of projects are under way to improve the system; among them is a feature that will allow students to rank the reviews posted to the site.

“Our main focus is to discover if teachers are respected and if students in their classes are learning or bored or frustrated, and we are doing a good job of that,” Hussey says. Even with anonymous reviews, he adds, “you can tell who is respected in their class and who is effective as a teacher.”

While in some ways the site functions to provide sanctions against abusive teachers, it turns out that 60 to 80 percent of the reviews are positive, and that some of the most negative commentary comes from teachers talking about their colleagues. Hussey notes that the objections from some are balanced by favorable commentary from others who say the site has helped them to improve their classroom effectiveness.

Take Dennis Buonafede, an Ontario, Canada-based high school teacher who asked his students to use RateMyTeachers to help him improve his teaching. “As a new teacher, I’ve often wondered what my students thought of me and my teaching ability,” he says. Understandably, the majority are either too shy or too concerned with possible repercussions to speak out in class. “I ask them to be fair and respectful of my feelings, but not to hold back on what they think.” Once there was enough of a representative sample, certain patterns developed. “Admittedly, some of their comments stung, others were (I think) unfair, and many were encouraging,” Buonafede continues. “Whether good or bad, they all helped me improve.”

Currently, RateMyTeachers is eking out a profitable existence based on ad revenues, largely provided by Google AdSense. “We feel we offer an interesting and valuable opportunity to reach a significant localized audience of savvy teenagers,” Hussey says. With usage growing roughly 10 percent per month and doubling every six months, those ad revenues may amount to something worthwhile over time.

OpenRatings: Source control

Sellers have long had access to the credit histories – i.e. the financial reputations – of most of their customers. But buyers don’t generally have the same level of information about suppliers.

“Sellers invest a lot in generating a favorable reputation for themselves,” says OpenRatings co-founder and CEO Stan Smith, formerly vice president and general manager of Agile Software, a maker of content management software. “They make

sure you only find out what they want you to know, but the buyer's creditworthiness is exposed by a third party" such as Dun & Bradstreet or Equifax.

In turn, this gives some unfair economic and informational advantages to sellers. "Buyers have been paying [both] for their own credit risk as perceived by the seller, and for the performance risk of the seller," Smith says. In other words, when sellers fail to deliver, buyers have little recourse, and no way to share that information with others. Are the sellers meeting their delivery dates? Are they having quality problems? Cash flow problems?

OpenRatings' reputation system helps buyers in complex supply chains predict which of their suppliers may perform badly. Begun as a project at MIT's Media Lab by company CTO Giorgos Zacharia while a student there, the company counts United Technologies, Xerox, United Airlines and Rockwell Automation as customers.

Dun and Bradstreet, an investor in OpenRatings, provides much of the data used to track and analyze more than 40 million suppliers. OpenRatings also gathers information about suppliers directly from customers, including data about on-time delivery, quality, cost, customer support, personnel changes, responsiveness, order accuracy, reliability and overall performance against competitors.

Finding and interpreting correlations within its own data and that from D&B is OpenRatings' mission. "There are a number of things companies do to respond rapidly to problems in their supply chain but we are about prevention rather than finding a cure," Smith says. "Part of our intellectual property is [knowing] what patterns in which industries with what-size companies mean something."

OPENRATINGS INFO
Headquarters: Waltham, MA
Founded: May 1999
Employees: 27
Funding: \$25 million from Ampersand Ventures, Atlas Ventures and Dun & Bradstreet
Key metric: profitable
URL: www.openratings.com

Some of the correlations are counterintuitive. For example, companies that are just getting into trouble often pay off existing debts early to clean up their credit scores. Then, they either obtain additional credit, or they fail. Of course, the early warning provided by a cleaner credit score works only when that information is compared against other data gathered on the company.

To ensure accuracy (and reduce rancor), OpenRatings offers suppliers the ability to see, challenge, and correct ratings given by customers. In practice, however, Smith says that digging deeper into the reasons for poor ratings usually reveals additional problems rather than inaccuracies.

A growing number of suppliers use the information in the OpenRatings database to monitor their own performance with a specific customer or overall performance. “We even have companies that use their performance feedback/scores as a basis for their executive compensation; it’s real pay-for-performance,” Smith says. Suppliers also use OpenRatings to provide information on past performance to the General Services Administration – a requirement for suppliers bidding on federal contracts.

Surprisingly, the clarity the system offers tends to repair relationships rather than destroy them, even with troubled companies, says Smith. In the world of supply chains, trading partners tend to have long relationships over many transactions – a sharp contrast to the large numbers of one-time transactions between strangers at eBay. Finding a new supplier is expensive, and in most industries, large companies change only 5 to 15 percent of their suppliers per year. “[In the past], suppliers have tried to hide their problems until it’s too late,” Smith says. “Instead, we have customers call their suppliers and say ‘we know you’re going to be having a quality problem, and we want to work with you on that.’”

Sleeping well at Rockwell

Rockwell Automation, a 22,000-person company based in Milwaukee, WI, has been using OpenRatings for about six months to monitor the financial health of roughly 3000 suppliers. “We really wanted a more disciplined approach to supplier selection and risk management,” said Mike Sparger, director of purchasing for Rockwell’s Control Systems Group. “It has already our changed relations with our suppliers. When the OpenRatings system sends us e-mail saying ‘You have a supplier that is in trouble,’ we get in touch with them.”

Sparger says Rockwell has contacted several critical suppliers about negative information and has moved to reduce its risk by stockpiling inventory, asking suppliers to build ahead and looking for second sources. The company has also used OpenRatings’ supplier-assessment tool to help troubled suppliers improve their processes.

The system has also changed the supplier-selection process. “We also use it in the front end of the process. We run the OR data on every candidate,” Sparger says.

Currently, most of data provided by OpenRatings is based on information from Dun & Bradstreet and is supplemented by data provided by other OpenRatings customers. As a relatively new user, Rockwell is not yet feeding data back to OpenRatings, but it plans to.

Reputation Refineries

Microsoft's NetScan: Speech acts

Even in conversational spaces, it's possible to build reputation systems based not on what people say, but how they behave – how often they communicate, whom they communicate with, how they respond, and where they participate across a range of different discussions. This can be particularly useful in customer-relationship management and technical support.

One of the biggest public conversational spaces is Usenet. Though it has suffered from spam and disinterest on the part of many of its early users, Usenet is still used daily by millions of individuals. Google's decision (in February of 2001) to offer access to and hosting for Usenet may also give the service new life, but Microsoft seems to be ahead in analyzing the space.

Can you tell whether someone is a useful source of information about a topic, based not on the *content* of his writings, but on others' reactions to his posts? That's the possibility addressed by Microsoft's NetScan service, which helps Usenet users identify valuable sources of information and important topics within each group, and track the participation of favorite authors within and across different groups.

Unlike explicit feedback systems such as eBay or Epinions, NetScan helps users evaluate for themselves the quality of Usenet groups, as well as authors and conversation threads within each group, by analyzing and displaying patterns of user interaction. "Reputation systems don't make angels of us all, but they make visible those who are, and might tempt people to be angelic," says research sociologist Marc Smith, who has been working on the NetScan project since 1994. Smith started it as an academic project at UCLA and brought it with him when he joined Microsoft in 1998.

Today, Smith leads a team of 11 people in Microsoft Research's Community Technologies Group, and NetScan serves up half a terabyte of data to tens of thousands of users each month. NetScan covers over 110,000 Usenet groups, tracks millions of authors, and provides several different visualizations of groups, usage patterns and author activity.

While Google looks at the content of Usenet messages to help users find answers to questions, NetScan examines Usenet message headers and conversational threads to identify good sources of information. "We began by asking, 'What are the salient sociological properties latent in the data but not manifested or visible in the inter-

face?” says Smith, who earned his PhD in sociology at UCLA under Peter Kollock, an expert in “reputation studies” (SEE **RELEASE 1.0**, APRIL 1996).

“Authors vary significantly in their patterns of contribution and interaction,” Smith says. “NetScan makes these patterns visible so that users can make inferences about which patterns seem useful and which do not.” For example, systematic observation has shown that an author who posts 20 replies to 20 different threads is more likely to be providing useful information than someone who initiates one or two threads but never replies, or someone who posts 20 replies within a single thread.

Valuable threads can often be identified by their structure: Who made the initial posting, how many replies it received, how many different authors were involved, the length of time between the first and final post, the number of child messages for each possible parent message, and so on, all provide clues. Using behavior to define the probable value of content allows NetScan to steer clear of subjective judgments. “I don’t have to say someone is a flamer; I can just say they have a low thread-to-post ratio,” Smith says.

Smith characterizes the behavior of Usenet authors using four broad categories: answer person, questioner, debater and bursty debater – someone who comes into a group, posts a lot in a few threads for a short time and then leaves.

Answerers make up only 2 percent of the population, but contribute nearly all the information of value in a group, says Smith.

Usenet newsgroups can be evaluated with similar metrics. Those with a high percentage of returnees and a core of active authors are more likely to contain good answers to questions than groups with a high percentage of one-time visitors (cf. the tourist restaurants). Analyzing cross-postings makes it possible to see how different groups are related, and which maintain topic focus.

NetScan is developing number of approaches to visualizing interaction within newsgroups using standard approaches to information visualization (SEE **RELEASE 1.0**, SEPTEMBER 2002). These visualizations allow users to quickly discover relevant groups and to assess the behavior of individual contributors within those groups.

Sponsored but not controlled

NetScan is currently a free service, but Microsoft is considering revenue opportunities by providing it as an underlying platform for enterprises or community hosts, as

it does with Exchange, or as part of a service, such as a richer version of MSN Communities.

Even though it generates no direct revenue as yet, NetScan has a more subtle value to Microsoft as a means of enhancing the quality and reducing the cost of technical support for its products.

While NetScan covers all of Usenet, its focus is on Microsoft products. The company spends more than \$300 million a year on technical support, and that amount is growing. Says Smith: "The cost of a person on the phone providing support is astronomical. It costs dozens of dollars to pick up the phone, and that's not because we are doing it wrong. That's just the cost of keeping a trained person in a chair."

And there is strong interest in peer support; in August 2003, nearly 10 percent, or 214, of Usenet groups discussing Microsoft products had more than 1000 users.

NetScan also has the benefit of being Microsoft-sponsored yet influencing people's attention in a way that could not be described as censorship: It is transparent in how it works, relies on the community's own content and does not modify that underlying, independently posted content. Such a service is a competitive advantage because "people recognize that you have cultivated a healthy garden around your company, and that just moving towards your company can put them in touch with helpful people," says Smith.

The service also includes filters that can be applied by each user, not by Microsoft. "Spam shows we can't depend on technology or legal frameworks that assume most people are good," Smith says. "Online environments attract people with obsessive-compulsive disorder, and give disproportionate power to that minority: .0001 percent can screw it up for everyone else."

Awarding recognition to the positive contributors, however, can help turn lurkers into posters, and average posters into contributors. "If you put a hierarchy ladder in any group, some fraction will try to climb it, and social accounting mechanisms [which make

I don't have to say someone is a flamer; I can just say they have a low thread-to-post ratio.

Marc Smith
Research Sociologist, NetScan
Microsoft

explicit the level of contribution made by participants in a system] create that kind of hierarchy,” Smith says.

In addition to fostering the growth of support communities, Smith is exploring several new directions. A likely improvement is hardening the identity scheme used by NetScan. “There should be a community server from Microsoft,” Smith says. “Microsoft is the company that can make it possible for 143 million people to have access to cheap, reliable social accounting services.”

The need to differentiate between useful and useless participants in online conversational spaces is also apparent in chat rooms. Microsoft’s recent decision to shut public chat rooms might have been different had it been possible to keep the focus on the valuable contributors, inexpensively.

In the meantime, Smith is looking to apply NetScan’s technology to the 1500 e-mail discussion lists within Microsoft. “The dominant application of this technology may be inside the firewall,” Smith says.

Yet another possibility is making a personal version of NetScan that could help people manage their e-mail. For example, correspondents who always get a reply within six hours may be judged to be important, and so their messages (and messages that include them on the distribution list) can be inferred to be important as well. (Cataphora also analyzes communications patterns to discover social relationships. (SEE **RELEASE 1.0**, MARCH 2003))

Biz360: PR mirror

Biz360 condenses ephemeral commentary into tabular reputation data by analyzing press coverage of its customers and their competitors, keeping track of who said what and why.

“We provide automated, real-time, continuous feedback that lets you measure the outcomes of your messaging, and ultimately, how that affects your market share,” says CEO Bud Michael. “We allow you to identify new media opportunities, who is giving you favorable or unfavorable coverage, and key trend stories that should include coverage of your company.”

The company’s roots are telling. Founders You Mon Tsang (now chief marketing officer) and Dan Gartung (chief technology officer) were formerly with Brio

Software, a developer of software that helps companies measure their performance in areas such as sales and customer relations. Biz360 applies similar analytics to information outside a company. “We asked ‘How do you take what the world has learned about business intelligence inside the company to the world outside the company?’” says You Mon Tsang.

Its Market360 software applies text analysis and pattern recognition algorithms to more than 50,000 sources of content, including print, broadcast, the Web and message boards. It then calculates an assumed dollar value of press coverage received, taking into account ad equivalence, the size of the audience reached by the various news outlets, and the “mention momentum,” i.e. how often the customer receives coverage over different time periods compared to its competitors.

Also, if Hewlett-Packard were to analyze its recent coverage, Market 360 would offer comparisons to the amount and tone (positive or negative) of coverage received by Dell, Gateway, Apple, or other selected competitors.

Of course, press clipping and counting services have been around for years. What’s new is the ability to condense nuance into meaningful numbers, and to help answer questions about why coverage might be trending positive or negative.

By manually evaluating 30 to 60 articles, customers train the software to distinguish between positive, negative and neutral coverage. It is also possible to track “sentiment,” not just about the company as a whole, but also regarding particular messages and campaigns.

Other indicators ranked and tracked by the system include prominence within particular articles, mindshare relative to competitors, “zero mindshare” publications that have not yet written about a company or topic, favorable authors, and various breakdowns by region and publication type.

“The biggest trend here is that we are enabling corporate communications to take on a greater strategic role in the company,” says Michael. “Historically, senior management has seen PR as event-driven: The [Exxon] Valdez runs aground and spills oil, and you have to react.” He continues, “[Customer] Bank of America got a new CEO who said its goal was not to be one of the most admired banks, but to be the most

BIZ360 INFO
Headquarters: San Mateo, CA
Founded: February 2000
Employees: 55
Funding: \$20+ million from Foundation Capital, Granite Ventures, BA Venture Partners and Adobe Ventures
Key metric: About 70 customers paying \$20,000-50,000+ per year
URL: www.biz360.com

admired bank.” Using the Market360 software, Bank of America will be able to see whether it is moving toward that goal.

Customers can also assess the effectiveness of their spending on PR and other communications activities against other options such as advertising and direct marketing. Another Biz360 customer, McData, recently launched a product with no advertising at all, yet managed to outperform its competitors in both the press and the market, says Michael.

Customers can also find new outlets for coverage by tracking reporters who are following competitors and trends of interest to the company, and to time announcements more effectively in response to market developments.

VeriSign, for example, has been using the system for about two years, and Tom Galvin, the VP of public affairs, says he checks the system 6 to 12 times per day. “Biz360 helps us around the nuances of what is going on,” he explains. “It’s invaluable to see how we are being talked about.”

Of course, Biz360 can report only what others are writing. As the recent SiteFinder debacle shows, VeriSign’s reputation is ultimately in its own hands.

The company charges customers \$20,000 to more than \$50,000 per year for its services, and Michael says that revenues are doubling every year. The company has more than 70 customers, including 3Com, Bank of America, Cap Gemini Ernst & Young, Harley-Davidson, Hyperion, PacifiCare and VeriSign. Biz360 also recently announced a partnership with Factiva to expand the scope of its press coverage.

The Wrap on Reputation

Remember those ads for Dial deodorant soap: "I use Dial. Don't you wish everyone did?" You could say the same about reputation systems.

They seem to benefit everyone: They foster transparency, help customers get what they want, increase business for vendors and assign credit where it is due. Even independent reputation systems, designed to foster clean markets for the public rather than for particular vendors, can now be self-sustaining or even profitable through targeted advertising mechanisms that were not available even a few years ago, and

NAME	WHAT IT IS	COMMENTS	OUR RATING
AllExperts www.allexperts.com	Thousands offer free advice	Worth more than you pay for it	***
BizRate www.bizrate.com	Customers rate businesses	See the tension between the urges to sell and telling the truth	****
ChoiceTrust www.choicetrust.com	Background checks on doctors, nannies, contractors	Filtering out lemons	***
CitySearch www.citysearch.com	Reviews of restaurants, bars, shops, clubs, etc.	What's good in the hood	*****
Hot or Not www.hotornot.com	Are you a hottie, or do you just think you are?	Get the superficial part of dating over with quickly	****
Landlord Protection Agency http://www.thelpa.com/lpa/ntrb_description	Landlords rate tenants; other sites let tenants rate landlords	Non-slumlords check to see if you're a slummer	**
Sarlo's Guru Rating Service www.globalserve.net/~sarlo/Ratings.htm	Which of 1250 religious gurus is right for you?	Not much feedback from the enlightened ones, unfortunately	****
The Erotic Review www.theeroticreview.com	Customers rate sex workers	Not safe for work	***
Zagat Survey www.zagat.com	Ratings for tens of thousands of restaurants around the world	Zagat-rated means "+1" by default	***

How They Stack Up: Some Other Ratings and Reputation Sites: The line between ratings, comments, gossip and reputation isn't always so well defined. Following are some sites that gather and present a mix of structured and unstructured data to enable users to evaluate information or conduct business. Some are examples of services that have been around for years; others are "only on the Net." Most are based on first-hand experience, and all of them are suggestive of applications for reputation systems. See page 33 for more!

their audiences are growing as more people come online and get familiar with the concept. In fact, reputation systems might even foster trust where governments fail to do so. Only the bad guys could protest.

So, given the wonderful and visible example of eBay, why aren't they more prevalent?

The reasons are varied, but as we have illustrated in this issue, reputation systems are not magic. In addition to carefully honed rules, they require people to make judgment calls. A reputation system needs to be seeded properly and weeded over time. Also, eBay works closely with law enforcement when problems arise, so eBay's system would not necessarily work as well without a credible government in the background. At the same time, reputation systems are not bound by the constraints of due process that mostly keep governments from exercising arbitrary power precisely because reputation systems do not have statutory authority over anything. All they can do is expel people.

COMING SOON

- Social network services.
 - Nonstructured data analysis.
 - Maps and geolocation.
 - The future of e-mail.
 - State of the Net: Is our infrastructure sound?
- And much more. . . (If you know of any good examples of the categories listed above, please let us know.)

Moreover, the simple rules of transparency and reciprocity that govern reputation systems generate surprisingly complex results and aren't universally welcomed. Moreover, reputation systems will become targets as they proliferate and gain power: While power may not necessarily corrupt everyone, it does lure the corrupt and seduce the powerless who do their bidding. What better means to gain advantage than to subvert a reputation system? Even though power generally shuns transparency, it can use that transparency to make sure people stay in line and say the right things.

Thus, the transparency of a reputation system doesn't guarantee truth in a world where some people wield more power than others. Online reputation systems get very, very close to the "real world," generating both the transparency and the unreliable agenda-driven assertions (aka gossip) that we attribute to villages rather than cities. That transparency is mostly a guarantee of good behavior, but it can also drive skepticism and dissent underground. The challenge then is to build and proliferate reputation systems where reputation approximates reality. ■ R 1.0

Resources & Contact Information

Dennis Buonafede, buonafede@hotmail.com

Cory Doctorow, doctorow@craphound.com

Brian Dear, **Birdrock Ventures**, brian@birdrock.com; blogs, <http://www.brianstorms.com>; <http://www.nettle.com>

Bud Michael, **Biz360**, 1 (650) 548-0355 x352, bmichael@biz360.com

Amjad Hanif, **eBay**, 1 (408) 376-6332; ahanif@ebay.com

Brian Burke, **eBay**, 1 (408) 376-6461; bburke@ebay.com

Steve Abernethy, **SquareTrade**, 1 (415) 541-1020; steve@squaretrade.com

Marc Smith, **Microsoft Research**, 1 (425) 706-6896; masmith@microsoft.com

Chris Dellarocas, **MIT Sloan School of Management**, 1 (617) 258-8115; dell@mit.edu

Stan Smith, Giorgos Zacharia, **OpenRatings**, 1 (781) 290-0828; ssmith@openratings.com,
gzacharia@openratings.com

Michael Hussey, **RateMyTeachers.com**, 1 (207) 324-9459; michael@ratemyteachers.com

Mike Sparger, **Rockwell Automation**, 1 (414) 382-2000; mfsparger@ra.rockwell.com

Alexis Johnson, **Shopping.com**, 1 (650) 616-6544; alexis@epinions.com

Nirav Tolia, **Shopping.com**, 1 (650) 616-6555; nirav@shopping.com

Rob Malda, **Slashdot**, malda@slashdot.org

Paul Resnick, **University of Michigan**, presnick@umich.edu; <http://www.si.umich.edu/~presnick/>

For further reading (and reputation!):

Reputations Research Network: <http://databases.si.umich.edu/reputations>

Affero; Encouraging patronage by offering reputation; www.affero.org

Elance; eBay for independent contactors; www.elance.com

Experts Exchange; IT workers share knowledge; www.experts-exchange.com

FC; Disgruntled employees tell all; www.fuckedcompany.com

Infirmination; The inside dope on law firms (we'll spare you the jokes); www.infirmination.com

Kuro5hin; Similar to Slashdot, but not so noisy; www.kuro5hin.org

RateMyProfessors.com; Payback time!; www.ratemyprofessors.com

***RateMyVCs.com**; (We hope to see this, but it may have trouble getting funded!); www.ratemyvcs.com

Vault; Gruntled and disgruntled employees tell all; www.vault.com

Calendar of High-Tech Events

- OCTOBER 29-31** **Privacy and Data Security Academy** - Chicago, IL. A comprehensive review of strategies and standards for privacy and data security. Sponsored by the International Association of Privacy Professionals. Register online or call 1 (800) 266-6501; fax, 1 (215) 545-8107. www.privacyassociation.org/html/conferences.html
- NOVEMBER 2-5** **AeA Classic Financial Conference** - San Diego, CA. The American Electronics Association sponsors an opportunity for public technology companies to showcase their companies to the investment community. To register, contact Tina Morais, 1 (408) 987-4234; fax, 1 (408) 727-7057; tina_morais@aeenet.org. www.aeanet.org/classic/
- NOVEMBER 3-7** **Next Generation Networks** - Boston, MA. The 17th annual conference organized by Dave Passmore and John McQuillan will converge the alphabet soup of networking, including broadband wireless, IP telephony, network convergence, storage networking, network security and much more. Call 1 (800) 227-1234; outside the US, call 1 (630) 986-1432; fax 1 (630) 323-5324; e-mail registration@bcr.com. www.bcr.com/ngn/
- NOVEMBER 11** **Social Networking Shootout** - Mountain View, CA. Representatives from four social networking companies get grilled on stage by a panel of judges, including our own Esther Dyson. Organized and moderated by Rafe Needleman. Contact him for details: rafe@rafeneedleman.com. website: www.ibdnetwork.com **E**
- NOVEMBER 14-15** **Online News Association** - Evanston, IL. In its fourth year, the ONA conference brings together leading journalists to talk about what's new in digital news. Esther Dyson joins a panel on the future of technology in journalism. Register online or call 1 (802) 434-6176; fax, 1 (802) 654-2560; HelpDesk@journalists.org www.journalists.org **E**
- NOVEMBER 15** **RFID Privacy Workshop** - Cambridge, MA. Sponsored in part by MIT, this workshop will bring together RFID technologists, boosters, critics, and journalists to talk through the privacy issues slowing the spread of RFID technology, as covered in June's issue. For more information contact Simson L. Garfinkel, slg@ex.com. www.rfidprivacy.org
- NOVEMBER 17-20** **Comdex** - Las Vegas, NV. Still the biggest technology trade show around. This year's speakers include Scott McNealy, Bill Gates, Thomas Siebel and John Thompson. For more information call Carrie Koeturius, 1 (415) 905-2352; fax, 1 (415) 905-2FAX; email, carrie.koeturius@medialiveinternational.com www.comdex.com
- NOVEMBER 26-28** **Digital Reykjavik** - Reykjavik, Iceland. Explore the potential of a society where every home is connected to a fiber network. Speakers include Esther Dyson. Register online or call +354 (595) 1500; fax, +354 (595) 1501; registration@digitalreykjavik.net. www.digitalreykjavik.com **E**

Calendar of High-Tech Events

2004

- JANUARY 8-11 **International CES** - Las Vegas, NV. The world's largest consumer technology tradeshow. If you're a gadget-head, this is paradise. For more information visit the website or call 1 (866) 233-7968; 1 (301) 631-3983 (outside US); fax, 1 (301) 694-5124; CESinfo@CE.org. www.cesweb.org
- JANUARY 15 **The Churchill Club** - Santa Clara, CA. Visionaries and such make their annual top ten technology predictions. Laugh at year's; believe next year's? For more information, visit the website. www.churchillclub.org **E**
- JANUARY 20-23 **LinuxWorld Conference & Expo** - New York, NY. The place to be for anyone interested in Linux and other open-source technologies. Visit the website or call Debbie Diodati 1 (508) 424-48471 or 1 (800) 657-1474 (general inquiries); debbie_diodati@idg.com. www.linuxworldexpo.com
- FEBRUARY 9-12 **Emerging Technology Conference** - San Diego, CA. Organized by O'Reilly & Associates, this conference frames the ideas, projects and technologies the "alpha geeks" are playing with. Register online or e-mail Linda Holder, lholder@oreilly.com. conferences.oreillynet.com/etcon **E**
- FEBRUARY 15-17 **Demo 2004** - Scottsdale, AZ. An IDG Executive Forum. Come play with the latest gadgets from the newest startups. Register online or contact 1 (800) 643-4668 or 1 (508) 460-1385, or via email at registrar@idgexecforums.com. www.demo.com
- FEBRUARY 23-26 **3GSM World Congress** - Cannes, France. The world's biggest mobile communications show. Keynotes include Arun Sarin of Vodafone, Rene Obermann or T-Mobile and PC Forum 2003 speaker Paul Otellini. Register online or contact Tamara James, 44 (1932) 893-855; fax, 44 (1932) 893-894; cust.serv@informa.com. www.3gsmworldcongress.com
- FEBRUARY 25-28 **TED2004** - Monterey, CA. Having presumably covered life and liberty, this year's them is "The Pursuit of Happiness." An always-eclectic group discusses technology, culture, design and other other catalysts for happiness. More information online, or contact TED curator Chris Anderson, 1 (650) 292-3300; chris@ted.com. www.ted.com
- MARCH 21-23 **PC Forum** - Scottsdale, AZ. The theme for EDventure's 27th annual PC Forum is "The Big Picture." The vision is clear; let's talk about the implementation. Stay tuned for details and your invitation. And save the dates! Contact Daphne Kis, 1 (212) 924-8800; fax, 1 (212) 924-0240; e-mail, daphne@edventure.com. www.edventure.com/pcforum/ **E**

E Events Esther plans to attend.

Lack of a symbol is no indication of lack of merit. The full, current calendar is available on our website, www.edventure.com. Please contact Christina Koukkos (christina@edventure.com) to let us know about other events we should include.

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