

Chapter 11

Trust and Online Reputation Systems

Ming Kwan and Deepak Ramachandran

Abstract Web 2.0 technologies provide organizations with unprecedented opportunities to expand and solidify relationships with their customers, partners, and employees—while empowering firms to define entirely new business models focused on sharing information in online collaborative environments. Yet, in and of themselves, these technologies cannot ensure productive online interactions. Leading enterprises that are experimenting with social networks and online communities are already discovering this fact and along with it, the importance of establishing trust as the foundation for online collaboration and transactions. Just as today's consumers must feel secure to bank, exchange personal information and purchase products and services online; participants in Web 2.0 initiatives will only accept the higher levels of risk and exposure inherent in e-commerce and Web collaboration in an environment of trust. Indeed, only by attending to the need to cultivate online trust with customers, partners and employees will enterprises ever fully exploit the expanded business potential posed by Web 2.0. But developing online trust is no easy feat. While various preliminary attempts have occurred, no definitive model for establishing or measuring it has yet been established. To that end, nGenera has identified three, distinct dimensions of online trust: reputation (quantitative-based); relationship (qualitative-based) and process (system-based). When considered together, they form a valuable model for understanding online trust and a toolbox for cultivating it to support Web 2.0 initiatives.

11.1 Introduction

To capture the hearts and minds of a digital generation, businesses need to redefine their communication approaches. Today's leading organizations are harnessing the power of mass collaboration, community, and technology to engage customers in a new continuum of participation that sees them acting as both final consumers and co-producers of goods and services. But knowing how to utilize Web 2.0 tools is

M. Kwan (✉)

nGenera (Formerly New Paradigm) 145 King St. East, Toronto, Ontario, Canada M5C 2Y7
e-mail: mkwan@ngenera.com

only part of this process. Determining which communication approaches are best suited to a particular business, its customers, and the image and reputation it wants to build, is crucial.

Since the *raison d'être* of Web 2.0 is collaboration—often with strangers—trust is the linchpin of this new continuum of participation. To succeed, users must trust one another and companies must foster the requisite level of trust to incent user participation. Web pundits make it seem simple: start a Facebook group, start blogging, create a community. However, a much more in-depth understanding of how trust is established, maintained and nurtured is needed before user engagement can be cultivated in today's online reality.

This report presents a model for understanding and building online trust based on:

- a quantitative measure of reputation;
- a qualitative measure of relationships; and
- a systems-based approach to establishing trust in an organization or its processes.

This model will be especially helpful to those establishing and using social media sites, online communities and other Web 2.0 applications—for employees, partners, and consumers alike.

However, one important caveat must be noted. Trust is *contextual* and depends entirely on the situation, time and purpose of an individual's engagement with a particular organization. What works for one enterprise at one time may not work for the next. Therefore, what is required is a dynamic, customized methodology for building online trust. Dr. Luca de Alfaro, associate professor of Computer Engineering at the University of California, Santa Cruz and lead of UCSC's Wiki Lab, describes the challenge: "*The more you open, . . . and with the multiplication of sources of information, the issue of trust will be ever more important*" [25].

11.1.1 What Is Trust?

The concept of trust is still open territory; particularly when it comes to characterizing it for the online environment. Many definitions have been developed by strategists and academics but no one definitive model has prevailed.

For the purpose of this paper, we offer the following observations. Trust is the expectation that others have (1) *good intentions*; and (2) *the competence to see those intentions through*. Trust is *non-transitive*: though I trust you, I may not trust the people you trust. And trust is highly situation-specific: though I might trust you for a given purpose (e.g., to fix my car), I may not trust you for a different purpose or at a different time (e.g., to babysit my daughter).

11.2 The Complex World of Online Trust

Online transactions take place in an entirely virtual realm where it is nearly impossible to receive the traditional cues that are apparent in the physical world.

Considerations such as body language, tone of voice, facial expressions and other important sensory data that inform people's perception of trust offline are missing in the virtual world. Today, new and more objective cues are being developed to help users gauge trustworthiness online. Enterprises must become fluent in the use of these digital cues, which, in many cases, are better indicators of user intention, competence, and reputation, than the mere sensory information we depend upon offline.

11.2.1 Learning to Gauge Intention

As Don Tapscott puts it in his book, *The Naked Corporation*, trust includes “*the expectation that others will be honest, accountable, considerate and open*” [36]. Online community members want reassurance that other participants possess similar aims and will observe social norms. Thanks to the transparent nature of these organizations, concerned members can witness for themselves whether a given individual has joined the community to be an active contributor and add value or pursue ulterior motives. Dr. Jennifer Golbeck, an assistant professor at the College of Information Studies at the University of Maryland puts it nicely, “If you can give them [members] more insight into what's going on and make it transparent, people will trust it more and especially if you're using social relationships. . .” [23]

11.2.2 Evaluating and Validating Competence

New methods for evaluating and validating user competence online have also been instituted. Approaches vary depending on the type of community but successful communities and platforms provide ways for enterprises to validate users, such as by investigating their activity histories or screening their past contributions.

11.2.2.1 Treating Online “Friends of Friends” with a Degree of Skepticism

Trust cannot be easily transferred (non-transitive nature). Although mapping out relationships and figuring out how individuals are connected within a network is simpler on the Web, this information doesn't make knowing *who* to trust that much easier to determine. And while the ancient proverb, “The enemy of my friend is my enemy,” may still form the basis of foreign policy doctrine, its antithesis, “The friend of my friend is my friend,” doesn't necessarily hold true—particularly online.

11.2.2.2 Tying It all Together to Provide Context

A given individual may behave in a trustworthy manner in one situation and not in another. The common thread connecting the three previously described characteristics: intention, competence and non-transitive nature, is that they are all situation-specific; they depend on purpose and time. Accordingly, trust varies by situation on

a case-by-case basis. Therefore, each online interaction should be evaluated individually to make the best determination, while keeping these three characteristics in mind to direct judgment.

Businesses, administrators, and creators of Web 2.0 tools are responsible for providing the necessary provisions to gain user confidence. Since face-to-face interactions are absent from Web encounters, the usual process of validation and authentication which traditionally informs our perceptions of trust is missing. So, how does one ascertain whether a person is really who they say they are? Web 2.0 tools are changing the game by providing new types of cues that are more relevant to the virtual realm. Forward-thinking enterprises have a strategic opportunity to become proficient at generating the requisite cues to engender high levels of trust with consumers, partners and employees so as to reap the rewards of these more profound business relationships.

As Shawn Broderick, founder and CEO of TrustPlus, a reputation-building and tracking service for the Web notes, “If we’re not trustworthy, then there’s no reason to pay any attention to us” [27].

11.3 Web 1.0 vs. Web 2.0

Where Web 1.0 employed a broadcast model in which enterprises disseminated information to users who were required to determine its validity; the model for Web 2.0 is a conversation between engaged participants who can self-organize and where transparency is achieved through broader access to information. “We’ve gone from broadcast to conversation and who’s talking in that conversation has become more important because of it,” [28] says Will Shaver, the developer of trust gradients [33] for distinguishing between new and vetted information on Wikipedia. Companies, news agencies and broadcasters no longer have the lock on influence that they held under Web 1.0. Today’s enterprises must learn how to deal with this shift in power and influence online and consumers must adapt to this new environment.

With Web 1.0, consumers were used to reading a monologue of certified information; whereas, Web 2.0, is about collaboration and trusting the people on the other side of the conversation. Users now have the power to discuss information, debate it among themselves and express their opinions. The catch is that they need to learn how to filter out the noise now that everyone has a voice.

11.3.1 How Can It Help Me?

Customers, employees and prospects are already using the Web to interact with each other and build communities; complex relationships are being developed, models of trust are maturing and social norms have already been established. As enterprises join these communities and try to extend their brands online, it is important that they understand this landscape and are familiar with the different elements of trust.

Companies that are trusted can become online community leaders and respected sources of information, as well as garnering support for their brands from evangelists.

There are three, distinct key influencers of trust that can help enterprises take advantage of the opportunity and change ushered in by Web 2.0. They are not mutually exclusive. In fact, they are closely related. The most successful companies use the three of them to form a customized approach to building trust.

11.4 The New Model of Online Trust

Three new approaches to understanding and building trust are emerging (Fig. 11.1):

1. **Reputation Based** (Quantitative)
2. **Relationship Based** (Qualitative)
3. **Process Driven** (System)

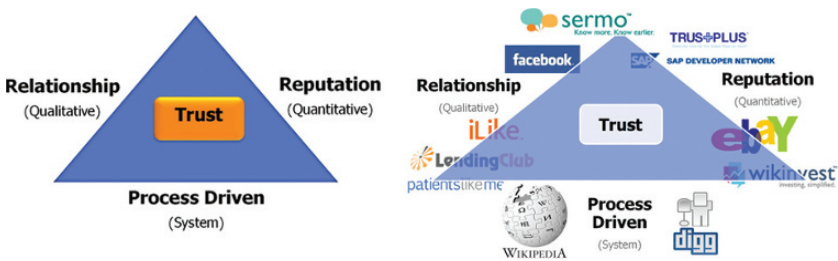


Fig. 11.1 Model of online trust (Source: nGenera Insight 2008)

This model highlights the elements that need to be present when establishing trust with employees, partners and/or consumers (an important consideration for online communities). It also provides a comprehensive reference point for developing applications and platforms that users will find reliable and trustworthy.

11.5 Reputation

Systems that measure reputation allocate a score to the trust object (trustee) for a particular event, transaction, or individual. These scores provide a quantitative metric for others to adjudicate and form opinions about. Rating systems are the most common method for establishing reputation. The most obvious example of an organization that successfully measures reputation to build trust is eBay – arguably the first Web 1.0 company to popularize the concept. Much of eBay’s success is due to its feedback system. Buyers and sellers are used to the idea of reputation scores and consider them a reasonable indicator of a person’s relative trustworthiness and reliability.

Scores can also be provided in the form of a title or designation rather than as ratings. However, for such designations to be effective, they must be valued and difficult to achieve, otherwise they will be perceived as useless. Microsoft's developers' communities have done this well. They encourage users to contribute consistently and with high quality through Microsoft's Most Valuable Professional program (MVP) which is recognized and valued throughout the developer community. The program is not limited to Microsoft networks; it is applicable to all developer communities related to Microsoft services [17].

The MVP program has an aura of esteem, especially since only 3,500 people have earned the designation worldwide, out of more than 100 million participants [7]. Not only is it a prestigious designation, Microsoft also offers MVP awardees benefits that act as strong positive reinforcements for developers to add value to the communities in which they participate. Natty Gur, an enterprise architect, MVP and SAP Developer Network (SDN) top contributor, puts it this way,

... As an MVP, you are very connected to developers and teams internally at Microsoft and you have the ability to, if not influence, to be aware of their directions right now.... you get benefits that others don't have, so it puts you in a better position [26].

Gur contrasts Microsoft's MVP program with the SAP Developer Network (SDN):

In the SAP area . . . you can contribute as much as you want, you don't have any mechanism at all to connect mentors to internal teams inside SAP... Those guys we talked to at Microsoft were very enthusiastic about it [MVP], because we have direct impact on the things they are doing and they can use it as valuable assets to finding solutions. At SAP, it's missing. SAP teams and developers are detached from the field [26].

11.5.1 Trouble in Paradise—The SAP Developer Network

SDN is an example of a community struggling with the problems of incentives and gaming. Although SDN has experienced significant success, its poorly designed reputation system requires significant modification. Scale has also affected the community's dynamics. Eric Johnson, a consultant and top SDN contributor observes:

I think there're still a lot of really good ideas and a lot of really smart people [at SDN]... but now, there are so many average answers to go through. I used to post a question and get two really, really good answers and one average answer. Now, it's gone the other way, where it's ten or 15 people who just link to other threads... [20]

Active contributors to SDN remark that the overall quality of contributions was much higher at the community's outset largely because users were able to keep track of contributors. Top contributors knew each other and users felt pressured to contribute relevant, value-added input since it was an indication of their competence. Now that the user base has exploded to over 1 million users [32], the community has outgrown the tools SAP provides, and is no longer successfully managing itself. One key reason for this is that SAP's reputation tool is so one-dimensional.

The root of the problem is that SDN allows users to accumulate points simply for answering questions, no matter how good or bad the quality of the answer. According to insiders, many SDN users are now participating for reasons other

than acting as a resource to others, thereby increasing the “noise” in the community. Johnson affirms, “A lot of people are just on there [SDN] for the points... it’s starting to erode the spirit of the point system” [20]. Multiple incentives encourage users to participate, such as developing a high point count (which builds the perception that one is a reputable contributor) being recognized on the Top Contributors chart, or even, receiving tangible rewards, such as iPod giveaways. “Unfortunately, none of these are the ‘right’ reasons to be contributing,” says Anton Wenzelhuemer, T-Systems and SDN top contributor.

In general, the material on SDN is quite trustworthy... But lately, there is unfortunately, more and more material contributed which is just trivial (not to say useless). This seems to be a problem of scale as well as SDN’s recognition system which encourages people to cheat the system, which, in turn, decreases the quality and trustworthiness of the whole content [19].

Critics of SDN claim that there has been a significant increase in average to below average contributions, all of which are made simply to gain points. To address this problem, SAP recently introduced the SAP Mentor Program which is loosely based on Microsoft’s MVP concept. It’s a step in the right direction but some issues still need to be addressed. Although SAP mentors are nominated and undergo a review process, the main determinant in being accepted is still the number of acquired points rather than the quality of contributions. According to Natty Gur:

The SDN community just goes by the number of posts that I’ve done and the points for each post and that’s all, they don’t count the quality, just the quantity. And it [the contributions] must be over the SDN, if I have my own Website and I’m writing tons of things on implementation in the SAP area, they don’t care about it. For them, it’s a way to keep the trusted contributors on the SDN. With Microsoft, it’s “You guys are helping our customers and we know it and we want to thank you and we will give you some kind of prize that you will be attributed with and we will connect you internally to the right teams because you will benefit from it and we will benefit from it.” It’s a completely different attitude [26].

11.5.2 When to Use Reputation as the Basis for Trust

Although a reputation-driven (quantitative) system provides an easy and objective way to measure reputation within large groups, these can be inflexible and must be carefully designed. Otherwise, they can easily be abused and gamed for their perceived benefits. Reputation systems are excellent for evaluating commercial peer-to-peer *transactions* and creating content or knowledge. Using an objective authentication process to supplement a reputation system further augments trust by reassuring users that they are among verified community members.

A properly designed reputation system creates incentives for users to behave honestly and reputably. Therefore, it is important to build algorithms and measure feedback quantitatively to promote positive behavior and discourage gaming. When users are not held accountable for the content, feedback, and ratings they contribute, there is no incentive for them to behave honestly. This increases the risk of gaming and decreases quality. Anonymity (in the context where an individual user is not attached to an identifying screen name or pseudonym) is not encouraged for

reputation systems since reputation is built on the ability to authenticate users and hold them accountable for their actions.

11.6 Relationship

Another dimension of online trust, relationship, relies on *qualitative* assessments based on connections found in social networks and online communities. Here, the end user must make a decision with heavy reliance on the context of the situation and the available data. Users employ sources of rich information—contributed often by other users—to make educated decisions and judgments about situations and people.

Although online trust is not perfectly transitive, viewing information about a person's extended relationships is useful when making inferences about other people's trustworthiness. For example, knowing that user "Y" is a friend of your friend "X," makes user "Y" slightly more credible. To that end, most social networks have some form of "common friends" or degrees-of-separation function that represents these extended relationships.

Communities naturally exploit the relationship dimension of online trust since it is an extension of people's need to interact. Members tend to bring relationships into an online community and manage them with or without official endorsement. Self-organizing end users call their own shots and make decisions based on their preferences. When users express relationships explicitly (by creating a list of "friends") it makes communities incredibly easy to segment, since users often cluster in groups of like-minded individuals that share common interests, habits and preferences. Often in these types of networks, consumers will seek out corporate groups or companies that interest them—these are the most loyal and attentive audiences.

11.6.1 Social Networking

Facebook is an ideal illustration of the power of relationships. It has quickly become the second most popular social network (behind MySpace) based on hours spent (ComScore, August 2007 [8]), with 85 percent of the four-year university student market [6] and expanding high school and working professional populations (more than half of Facebook users are outside of college [6]) (Fig. 11.2).

All Facebook users complete a basic profile where they have the option to fill in personal information. A typical profile may include, but is not limited to, facts about the individual's education, interests, favorite movies, books, TV shows and quotes, as well as contact information (such as e-mail, phone number, address). Thousands of additional applications allow users to share photos, videos, travel experiences, surveys, blog posts and virtually any other information imaginable, and the ability to create public and private groups and events.

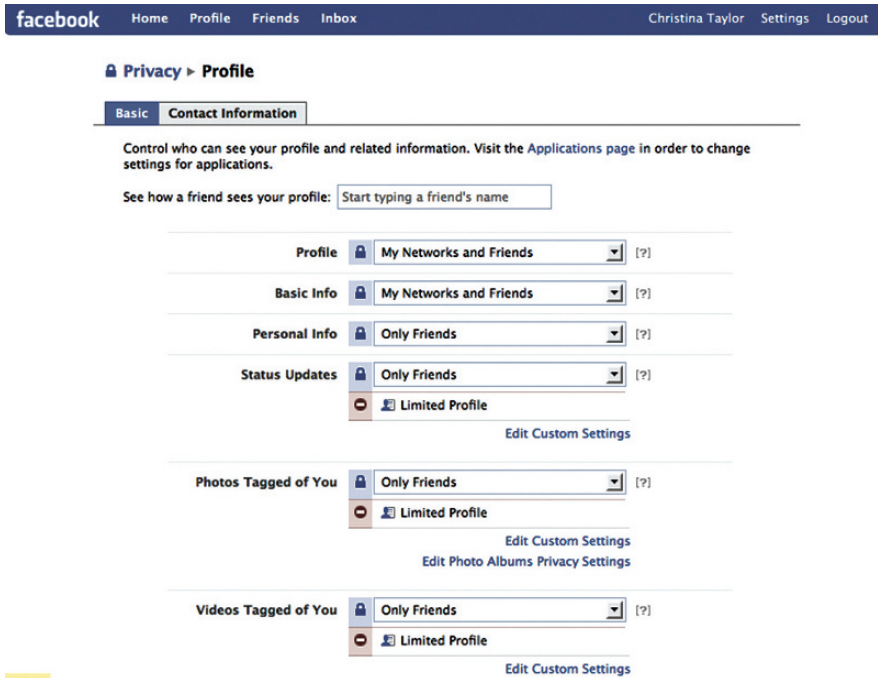


Fig. 11.2 Privacy settings in Facebook (Source: Facebook.com)

User profiles contain a plethora of rich, searchable information—a lot of which is created automatically, based on your activity. For instance, one of the richest, most informative elements of a user's profile is a simple "newsfeed" of recent actions such as adding friends, posting photos, or joining groups (Fig. 11.3). Another informative element, out of any specific user's control, is the "wall posts", or comments left by friends for everyone to see. These two kinds of rich information (and others, such as favourite videos, music, etc.) make it is easy for users to find others with similar interests. Facebook is organized on networks based on school, geographical area and/or place of employment. By default, any member of a user's network has access to his or her profile, but users have control over privacy settings that manage who may view their profile, message them etc. and these settings can be network specific.

Joining Facebook doesn't automatically allow one to see everyone's profile. Instead, there is tiered system. Some users have open profiles that permit anyone within their network to view their page; others have completely closed profiles that can only be accessed by their friends. Accessing a closed profile requires an additional layer of authentication based on a "friend request."

Certain features provide readily accessible information about a user's activity. For example, the "newsfeed" feature updates each time a user performs any task on Facebook (if they didn't adjust privacy settings). These features inform every

The image shows a screenshot of a Facebook news feed. At the top, there is a navigation bar with the Facebook logo and links for Home, Profile, Friends, and Inbox. Below this is a search bar with the text "What are you doing right now?". To the right of the search bar is a "Feed Filters" button. The main content area is divided into several sections:

- News Feed:** This section contains several posts:
 - A post by Colleen Howe: "Colleen Howe is off to get my back cracked, I love chiro's! 41 minutes ago - Comment"
 - A post by Sharon Cookman: "Sharon Cookman iscontinuing the countdown!!!!!! 2 MORE DAYS TO GO GIRLS!!! Oh and Sharon is the proud owner of a brand new car!!! :). about an hour ago - Comment"
 - A post by Amanda Mallais: "Amanda Mallais is working & babysitting, a real dose of reality for most parents I guess. 2 hours ago - Comment"
 - A post by Cheryl Lynn Madigan: "Cheryl Lynn Madigan joined the group CBI-Childbirth International Students & Graduates. Comment"
 - A post by Cheryl Lynn Madigan: "Cheryl Lynn Madigan joined the group Childbirth International. Comment"
- Comment:** A comment by Amanda Mallais on Amy Stewart's photo: "Your little one is so cute!!!!"
- Sponsored Ad:** An advertisement for PetCare Pet Insurance. The text reads: "Avoid Expensive Vet Bills! Insure your pet's health with PetCare Pet Insurance. Affordable, comprehensive health insurance for pets." The ad includes a small image of a pug dog and the PetCare logo.

Fig. 11.3 A facebook news feed (Source: Facebook.com)

friend in the user's network about everything from new pictures added or tagged, to planned events, to messages posted to others' profiles, and even relationship status. As 22-year-old Katherine Kimmel notes, "You're not really dating until you put it on Facebook" [31].

Users can employ this wealth of information to make better informed decisions based on specific trust cues; particularly since context is all important. For example, one seeks different characteristics in a party guest than in a potential tenant. The "party host" user has the option of relying on other users' friends list, music preferences, party pictures, and relationship status to select a guest. Likewise, cues about employment status, family pictures, and friends' comments could be used to inform a decision regarding the selection of an appropriate tenant. The information users display in their profiles contributes to the kind of opinions viewers form of them; including their level of "trustworthiness."

11.6.2 Opening Up APIs

To exploit the countless opportunities presented by the relationships on its network, Facebook opened its Application Programming Interfaces (APIs) thereby allowing third-party applications to be developed. This open platform provides an opportunity for businesses to leverage existing relationships and pre-established trust. Trust levels on the network tend to be high since many Facebook relationships stem from real, in-person relationships. Businesses such as Lending Club (a peer-to-peer lending service), Faceforce (a customer relationship management CRM plug-in), WorkLight (a secure enterprise overlay for Facebook), and iLike (a clever music sharing application) have thrived in this manner.

11.6.3 Exploiting the Value of Social Networks

Faceforce is a mash up of a popular Web-based customer relationship management (CRM) software, Salesforce.com, and Facebook (Fig. 11.4). Faceforce was developed by Clara Shih, AppExchange product manager at Salesforce.com and Todd Perry, a software engineer at Facebook. As such, Faceforce isn't affiliated with either company [29] (Fig. 11.5).

Although initially, people questioned the value of integrating the two platforms, Faceforce soon proved its worth by empowering users to build deeper relationships with their customers and prospects. Faceforce opens a new world of opportunity by



Fig. 11.4 Faceforce is a mashup of Facebook and Salesforce.com

Faceforce is a connection utility that **unleashes the power of your social network** for building **better customer relationships**.

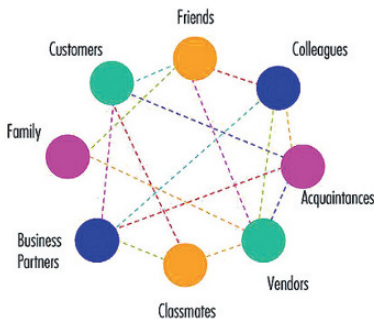


Fig. 11.5 Faceforce flash demo, created by Clara Shih, the application's developer [34]

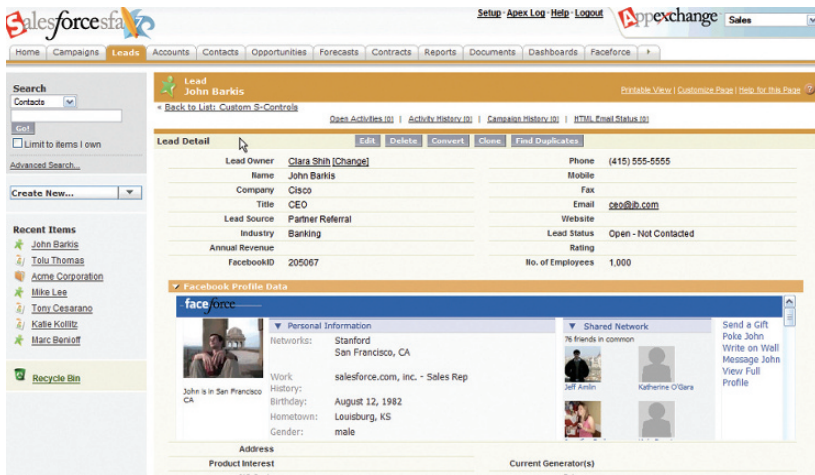


Fig. 11.6 Screenshot of Faceforce interface [34]

bringing the power of relationships to contact management and cold calling. Today, users of both platforms can access rich data that connects relationships on Facebook to potential business contacts and leads from Salesforce. The mash up also allows users to perform typical Facebook actions, such as messaging, writing on a wall, sending a gift, poking, and viewing a full profile (if the user appears on the contact's "friends list") (Fig. 11.6).

11.6.3.1 WorkLight WorkBook

Unlike Faceforce which is free, WorkBook is a subscription-based security overlay for Facebook that enterprises can purchase for \$10 per user per month. Developed by WorkLight, WorkBook is a secure Enterprise 2.0 solutions provider [13]. This application allows employees to interact securely with peers through Facebook. "WorkBook combines all the capabilities of Facebook with all the controls of a corporate environment, including integration with existing enterprise security services and information sources" [37] (Fig. 11.7).



Fig. 11.7 WorkLight has developed WorkBook, a secure Enterprise 2.0 solutions provider (Source: myworklight.com)

WorkBook addresses the typical security concerns that arise when employees use public sites to post potentially private company information; the overlay works within company firewalls and integrates the collaboration and communication capabilities of Facebook with the needs of the workplace. Employees are able to search for colleagues with similar interests or required skills by name, location, and area of expertise, as well as publish and receive company-related news, create bookmarks to enterprise application data, share information securely with authorized colleagues, and update their status [37]. By making it relevant to the enterprise and leveraging users' familiarity with the popular Facebook product, this application is helping companies warm up to the idea of using social networking within a business context.

WorkLight also provides secure integration of enterprise applications for 13 other consumer technologies: MySpace, Facebook, iGoogle, Netvibes, Microsoft Live, Yahoo widgets, Apple Dashboard, Google Desktop, Windows Vista Sidebar, del.icio.us, RSS, Google Gears and Adobe AIR [30].

11.6.3.2 Social Graphs Anchor Relationship-Based Trust

WorkBook and Faceforce aptly depict the concept of *social graphs* as models for contextual relationship-based trust (Fig. 11.8). A social graph is a set of relationships, appropriate to a given purpose—for instance, my social graph for work colleagues (or even a particular work project) is different than my social graph for friends (or a party). To accommodate different social graphs, companies such as Facebook are exploring allowing users to present different profiles of themselves for different purposes (though this is not available at press time). For example, users would typically want to share different information and different elements of their online profiles with different groups (e.g., work colleagues, family, friends). The best relationship-based trust systems will allow users to create different social

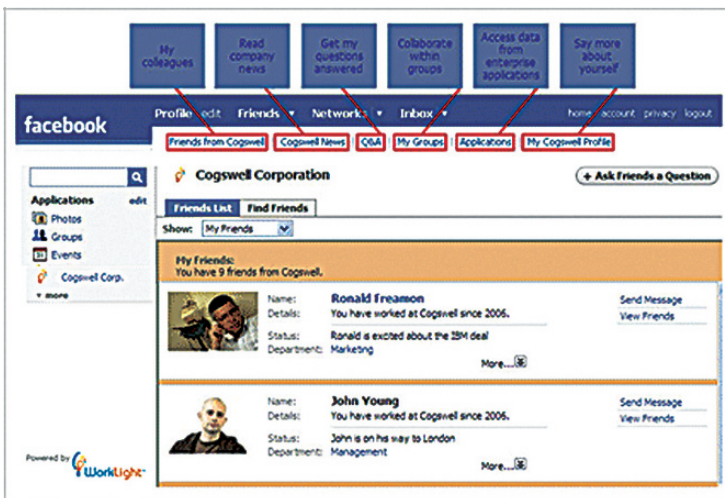


Fig. 11.8 Screenshot of WorkBook's Facebook overlay [30]

graphs and leverage these differences to offer situation specific features and functionality. A planning space for a business meeting and a Friday-night party would naturally require different elements. A system that can allow for these types of distinctions will ultimately flourish.

11.6.4 *iLike... to Share... and Lend*

Increasingly, companies are finding that they can achieve phenomenal growth by incorporating social networking applications into their business models. A social music discovery company, iLike, developed a complementary Facebook application that has achieved viral success by leveraging existing friendships and connections. The application exploits established relationships and young peoples' desire to share music with their friends (Fig. 11.9).

iLike CEO Ali Partovi provides some insight into why the company is thriving: "...Our system was always tied to friendships, [so] it became naturally viral.... On Facebook, we built this application that really took advantage of and depended on friend relationships as a core part of the discovery. The relationships were already present and an intrinsic form of trust was there already" [12]. Simply put, users were willing to add the application to their Facebook profiles because their friends were adding it. Within one year, iLike has amassed over 21 million users [18] and is still growing according to a company representative. When iLike first integrated with Facebook, it grew at a rate of approximately 300,000 new users per day for the first two weeks [10].

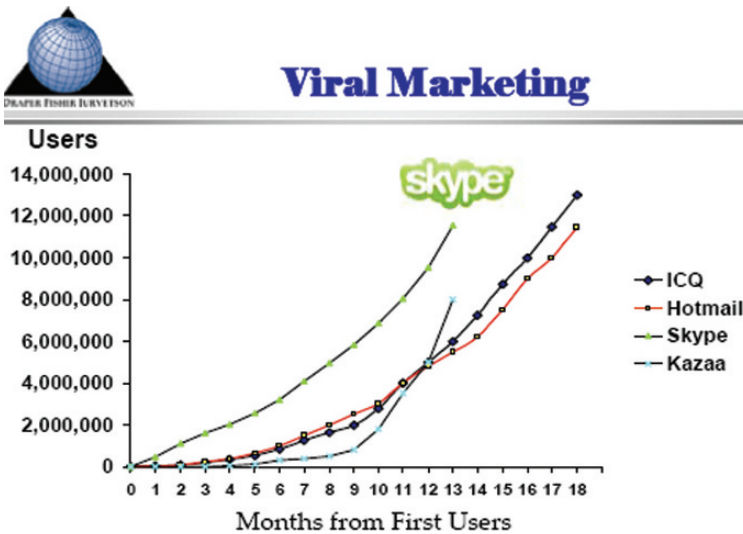


Fig. 11.9 Monthly growth of social networking sites since launch (Source: Tim Draper Presentation on Viral Distribution, via Like blog 2007)

Partovi further explains:

It's really an exciting time to be an entrepreneur because [Facebook] made possible things that just would not have been possible to build five years ago or two years ago... There are so many new things someone can create today as a start-up that just wouldn't have been really feasible before the Facebook platform because of the way it lets you take advantage of friend relationships and because of the viral growth that it enables. It exposes a lot of personalized data about a user that you can use to create really neat things [12].

The use of relationship data extends to other industries as well. Consider the credit industry, which now has the ability to extend its traditional reputation-based trust system (i.e. only considering numeric credit ratings). New finance-based entrepreneurial ventures are looking to harness the power of Web 2.0 and its ability to incorporate relationships and processes to add value for consumers. Prosper.com is one of the most successful peer-to-peer (P2P) lending sites to date, with more than 600,000 members and \$122,000,000 in loans. From a company spokesperson, "Our system uses a powerful algorithm called LendingMatch, which finds relationships between borrowers and lenders based on geography, education, profession, or connectedness within a given social network and then presents lenders with diversified loan portfolios reflecting these relationships, as well as the lender's individual risk preferences" [5].

It is estimated that \$267 million [2] worth of loans were made in 2007 through social lending, making it one of the faster areas of growth in financial services. According to the Gartner Group, "By 2010, social banking platforms will have captured ten percent of the available market for retail lending and financial planning" [7]. Zopa, another P2P lending service whose initial success was in the UK, now has approximately 185,000 members (although not all of them have transacted on the site) and has had about £20 million borrowed since its launch in March 2005 [35]. Since then, it has also launched operations in the US and Italy. Zopa's managing director Giles Andrews weighs in on the issue:

Banks are the worst offenders in this homogenous sort of way, certainly in the UK and probably in the USA. Banks have become extremely efficient in manufacturing new products. They make products that aren't needed to be made and aren't particularly relevant to consumers. That also applies on the investment side, they [banks] don't seem to have an understanding of the investment products that are being pushed and so you begin to think "well there must be an opportunity to create a market place." [22]

Social lending provides an avenue for users to customize their own deals in as transparent a model as possible—thereby catering to a growing group of self-reliant customers.

Another similar organization, Lending Club, is a new peer-to-peer lending service, which has developed a Facebook application. John Donovan, Lending Club co-founder & COO, explains,

We wanted to leverage the trust which exists within many social communities [like those on Facebook] and we knew that our platform provided value to the entire community, not just those who needed to borrow money. Leveraging and fostering trust was critical to establishing connectivity between members of various online social communities [24].

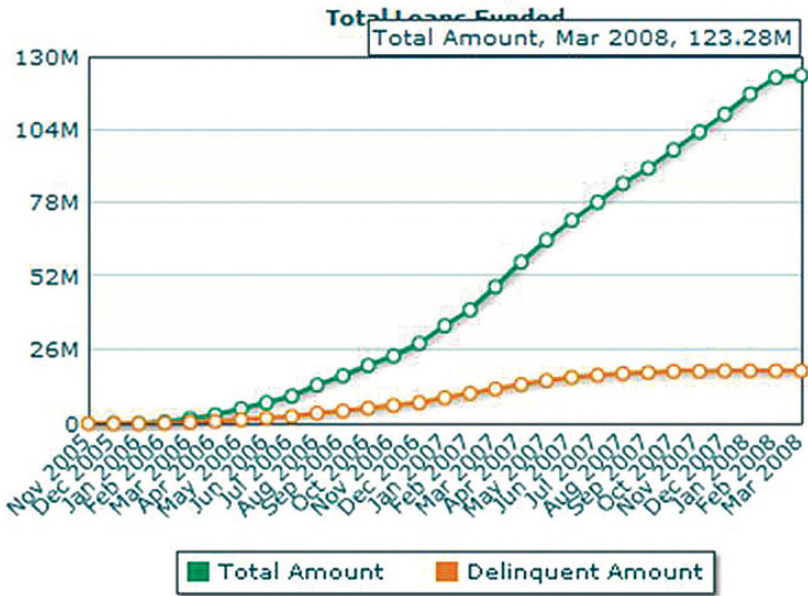


Fig. 11.10 Lending stats—Total Loans Funded [15]

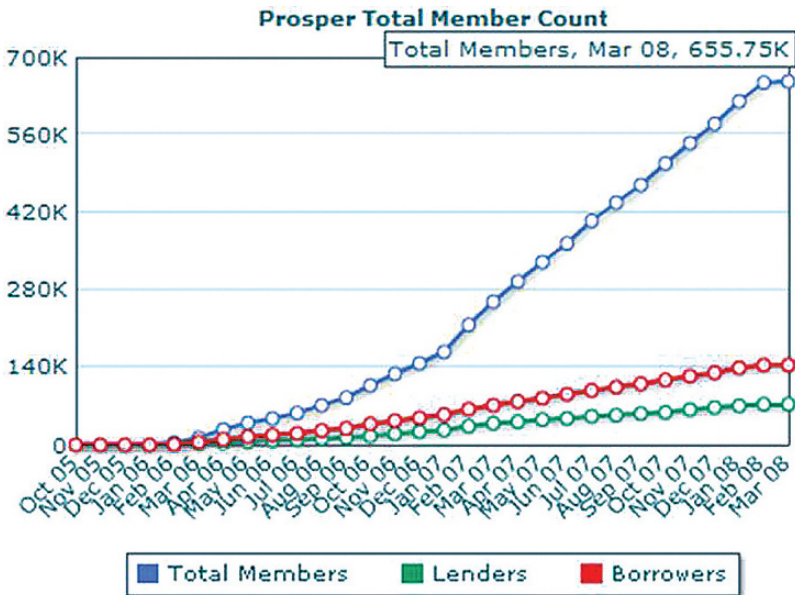


Fig. 11.11 Lending Stats—Prosper Total Member Count [16]

This strategy appears to have worked. From May 24, 2007 to February 29, 2008, LendingClub has issued 1,214 loans worth \$10,645,025, with a zero percent default rate [14] (Figs. 11.10 and 11.11).

11.6.5 Sponsored Groups

In addition to applications, companies have also created sponsored groups on Facebook (and occasionally, Facebook members create unauthorized versions of them; either because they love or hate the company). The content of these pages is not entirely company controlled. Although it can be moderated, companies must be careful about editing content because Facebook is transparent and people will talk about the company's actions. If users believe that an enterprise is censoring negative content, then they will take issue with it publicly.

Companies hoping to connect with customers should make use of Facebook groups where consumers seek out the groups that interest them. This provides organizations with a forum for gathering valuable information about the target audience and brand perceptions from both online interactions and user group contributions (if discussion and wall functions are enabled). A 2007 study by Britain's Information Commissioner's Office illustrates the wealth of information available on Facebook—reporting that 60 percent of users post their date of birth, ten percent post their address, 33 percent never read privacy policies, 60 percent have never considered that what they put online might be permanent and 70 percent don't care that their personal profiles can be publicly viewed [11].

11.6.6 When to Use Relationship as the Basis of Trust

Building online trust using information derived from relationships has its drawbacks. Due to trust's contextual nature, every situation must be considered individually. Moreover, because trust is non-transitive and highly personalized, such judgments are very subjective; placing greater emphasis on transparency. Right or wrong, a clear, objective view of the information flow and connections within a user's personal network increases the perception that their trustworthiness can be predicted.

Online communities and social networks are natural environments for building trust based on relationships. However, since relationship-inferred trust is based mainly on available information, the potential for bias or one-sided views of situations is always present. Relationship-based trust must be reinforced if trust is to be maintained.

In these communities, verification and authentication are vital. They ensure that the platform upon which the relationship is based (identity) is not compromised. If a social network opts away from verification, there is the potential for people to be wary of other users—a scenario that developed at MySpace when it was discovered that several convicted sex offenders were part of the community under pseudonyms,

posing a threat to that platform's large youth population. Allowing anonymous users to become members removes the checks and balances that discourage gaming. Users may not be held accountable for their actions, affecting both credibility and reliability.

11.7 Process

Sometimes, issues of trust relate to a system, procedure, or end-product rather than a person. This is called *process-driven trust*. For an online product or service to be considered trustworthy, a robust process and reliable system that provides a sense of control and accountability are mandatory.

A strong process allows applications to harness the wisdom of crowds and individual contributions and use it to create value in a community. Properly implemented, such a process decreases the need for additional measures to ensure community members and information found within the community are trustworthy.

The most obvious example of a process-based system is Wikipedia, the world's largest, free, online encyclopedia. Much of Wikipedia's success is due to the powerful process behind it; users know that a strong system of governance generates content that is, for the most part, reliable. With Wikipedia, a reader doesn't need to trust so much the last editor of an article (a person); rather, she can trust the transparent system of checks and balances (the process) that ensures any recent edit is relatively impartial and likely to be true.

Key features of Wikipedia's editing process are transparency and ease of use. All individual activities involving edits to page content are tracked. The edit history follows contributors/editors for a lifetime so "background checks" on particular editors are made easy by clicking on their profile for a full list of past edits, topics contributed to most frequently and the type of changes made. The ease of restoring previous versions of content if the latest one is vandalized is another key to Wikipedia's success. These simple, easy to use and transparent processes allow people to trust the online encyclopedia's content.

11.7.1 *Caught in the Act—Reinforcing Process*

Wikipedia has a group of dedicated volunteers that behaves as a governing body. Although these individuals occupy different roles, they all police Wikipedia—searching for vandals, identifying inaccurate information and retrofitting erroneous entries to ensure accurate and trustworthy content. Erik Moeller, a former member of the Board of Trustees of the Wikimedia Foundation, and the Foundation's current Deputy Director, notes:

A challenge is determining when to confer trust on people; to make sure that people who ascend into the inner circle of Wikipedia are not those people [gamers] but rather people who want to contribute to the mission of Wikipedia... The process is already reasonably strong in ensuring the integrity of the end result, at least when it comes to articles that are primarily edited by members of the trusted core community [21].

Yet, critics of Wikipedia remain concerned about the reliability of content; they feel that Wikipedia’s standalone process isn’t enough to deter destructive behavior. To remedy this situation, external third parties are working to make Wikipedia more trustworthy by creating complementary algorithms to help users infer trustworthiness. To date, developers at the University of California, Santa Cruz (UCSC) have made the greatest headway and have established a partnership with the Wikimedia Foundation.

The UCSC Wiki Lab, led by Professor Luca de Alfaro, is developing an algorithm that provides a visual representation for users to immediately gauge the trustworthiness of a sentence Figure 11.12. This method is arguably the most objective approach, since it pulls raw data from the edit history of an article, taking into account the number of edits the text has survived. The longer a word remains unedited, the more “trustworthy” it becomes. The algorithm also has the ability to link editing records back to the original author—thereby providing a way for determining an author’s relative trustworthiness based on their personal edit history and the length of time their edits remain untouched.

The most suspect content is highlighted in bright red, while the most reliable content has no highlighting. Alfaro has dubbed this particular system for determining reputation a “content-driven reputation system,” since the end product (the content) drives the process.

Another initiative to help make the content on Wikipedia more trustworthy is Wiki Scanner, developed by Caltech graduate student, Virgil Griffith. Wiki Scanner has the ability to link back anonymous edits to specific IP addresses. In turn, these IP addresses can be associated with specific corporations and organizations. Some common vandalism and abuse of the Wikipedia system as identified by Griffith are [9]:

1. *Wholesale removal of entire paragraphs of critical information. (This commonly happens to content about political figures and corporations.)*
2. *White-washing or replacing negative/neutral adjectives with positive adjectives that mean something similar. (This commonly happens to content about political figures.)*
3. *Adding negative information to a competitor’s page. (This commonly happens to content about corporations.)*

Executive

Template:Seealso

The Government performs the executive functions of the Kingdom. In appointing the Prime Minister, the Monarch consults the will of the people, represented by parliamentary leaders, in determining who should hold the office. As always, the person who has the broadest support from the members of parliament is chosen by the Monarch and confirmed by a vote of confidence by the Folketing. However, before the parliamentary confirmation, the Prime Minister-elect together with the leaders of his coalition partners selects the other Ministers which make up the Governments and acts as political heads of the various government departments. Cabinet members are occasionally recruited from outside the Folketing.

Since 27 November 2001, the economist Anders Fogh Rasmussen has been Prime Minister to Denmark.

As known in other parliamentary systems of government, the executive, i.e. the Government, is answerable to the Folketing. Under the Danish constitution, no government may exist with a majority against it, as opposed to the more common rule of government needing a majority for it. It is because of this rule, Denmark often sees minority governments.

Fig. 11.12 UCSC Wiki Lab demo [3]

This new application has embarrassed several government organizations and corporations. For example, ATM and security system provider Diebold has been caught editing Wikipedia on several occasions. In one case, it was caught deleting entries related to criticisms and controversy surrounding the company [4] (Fig. 11.13).

Similarly, Chevron was caught deleting an entry regarding the fine it had to pay for violating Iraq oil sanctions [1] (Fig. 11.14).

11.7.2 So What?

People recognize the value that a system like Wikipedia brings to the Web and ordinary citizens are working to improve it by closing gaps where the system can be



Fig. 11.13 Deleted elements from the Diebold Wikipedia article [4]

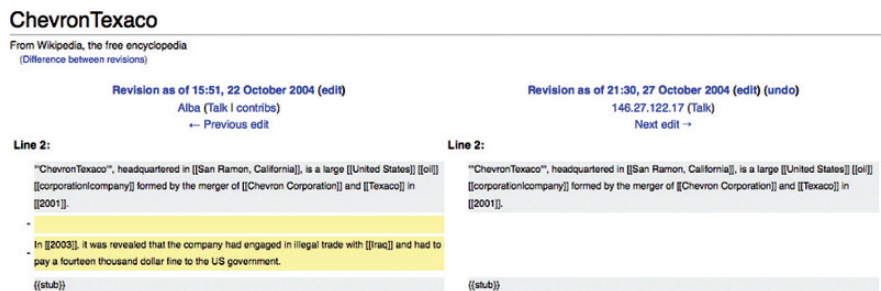


Fig. 11.14 Deleted elements from the ChevronTexaco Wikipedia article [1]

exploited or compromised. These individuals are developing mechanisms to provide transparency and accountability, and in so doing, are incorporating both the relationship and process dimensions of trust. The ability to link back anonymous edits to assigned IP addresses, especially those of known organizations, removes the element of anonymity. This, in turn, facilitates users' ability to search for trusted content and make better informed decisions.

According to the Wiki Scanner Website, there have been 34,417,493 edits in the English Wiki Scanner database from February 7th, 2002 to August 4th, 2007, and 187,529 distinct organizations that have made edits to English Wikipedia [9].

The ingenious manner in which Wikipedia incorporates relationship into its community is intimately related to its editing process which, in turn, helps users infer reputation. Each Wikipedia entry is associated with either an IP address or user account, through which all edits and contributions are tracked. Additionally, anyone using Wikipedia has the ability to click on a user's profile and view that individual's personal activity within Wikipedia. Inquiring minds are able to view what topics a user makes frequent contributions to and the specific edits made. It then becomes extremely easy for anyone to learn about the user and determine whether he is a productive member of the community, or a promoter of a hidden agenda.

11.7.3 When to Use Process as the Basis for Trust

The process-driven approach works well for items in "the commons" that need a strong infrastructure and system to guide users towards a specific goal or benefit. Having a strong process creates a natural incentive system for people to contribute positively. This dimension of trust requires the most involvement from administrators and designers, but it also represents the most value to users since it alleviates the burden of relying solely on reputation or relationship. Process-based trust also tends to be more scalable; making it appropriate for large groups of diverse users with unrelated motivations.

To reinforce user trust, various complementary features can be implemented. Important considerations include: keeping the process simple, transparent and easy to understand; employing an authentication/verification process to reassure users that community members have been screened; and ensuring all users are tied to one identifying factor so that activity can be tracked back.

Administrators should have faith that their system is built well enough to deter negative behavior, or at least be able to identify and retrofit it. Therefore, it is important to let the process play out the way it is meant to function, even when a "gamer" is identified. Erik Moeller explains how Wikipedia's underlying process is self-reinforcing:

There is a temptation to say... "They're just causing trouble, let's just get rid of them." But if you do that, they come back again under a different name, or they go away mad and bring more people back with them... What we have learned is [that] basically a very gentle approach works. You let them edit and you change things back after they make them a mess [21].

Employing a different process would not only aggravate potential vandals, it would also give the impression that even administrators do not trust the ability of the regular process to deal with detrimental behavior.

11.8 A Recipe for Online Trust Based on Three Ingredients

As organizations launch collaborative initiatives and participate in (or create) online communities, they must adapt their policies and practices to a radically different business landscape. They face important questions about how their relationship management, information sharing and behavioral practices will change. Central to these decisions is the foundational issue of trust. While the consequences of an absence of trust are very clear (take the crash of Wall Street in 1929 for example), it's far less obvious how to design and embed trust into the fabric of an online product, service, or community. nGenera's trust model, based on the dimensions of reputation, relationships and process, offers an excellent starting point. But how can that model be put to use in practice and what courses of action does it suggest for those seeking to engender trust online?

First, it's important that all three dimensions of trust work in concert. The best and most successful companies, whether purposely or inadvertently, often rely on a combination of reputation, relationship and process. This allows the various dimensions to reinforce each another, resulting in a stronger overall impact. For example, eBay's latest rating system adds qualitative *relationship* data (free-form comments from customers; plus some information about recent activity) to the traditional quantitative *reputation* elements (numerical ratings). This provides more depth to a potential customer, trying to distinguish between two potential vendors with similar quantitative scores—and it also helps ensure those quantitative scores are driven by more-calibrated input between different customers. In addition, all the famous eBay efforts to reduce gaming and fraud (including money-back guarantees through PayPal, for instance) improve the *process* element, the trust in the system itself.

In hindsight, such solutions can seem obvious and easy to implement, but in practice these systems are often designed with the utmost care and are deliberately structured to account for specific community needs. In the best case, an ill conceived or “cookie-cutter” approach to trust will simply be ignored and, in the worst case, it can lead to the demise of an entire community. The good news is that any organization can experiment with some relatively simple and risk-free approaches to enhancing trust. Thereafter, it will be easier for enterprises to envision, develop and implement the kind of complex approaches to trust-building that confer significant strategic advantages. The most successful approaches, like eBay's, evolve over time as participants identify successful elements and risk areas.

The following advice will prove helpful to forward thinking organizations seeking to use the previously described dimensions to cultivate online trust.

Reputation

1. **Incorporate provisions that make users accountable for their actions and encourage responsible behaviors.** If these measures aren't established, then there will be no incentive for users to act responsibly. A reputation system needs to be designed so that it isn't open to gaming, otherwise it will lose credibility and ultimately, fall into disuse.
2. **Build a system where reputation is hard to achieve and valued.** Reputation systems help anchor trust more permanently within a community. Users may be more reluctant to leave your network if there is value in the rating and reputation they have established.
3. **Provide the requisite tools for users to validate and authenticate.** These measures provide an additional layer of security; people want to know that the person they're speaking with knows what they're talking about and is who they say they are.

Relationship

1. **Offer transparency and privacy controls.** Transparency allows users to cultivate open relationships, while privacy controls offer the ability to manage the disclosure of information and level of interaction with others. To leverage this grass-roots source of trust, a community must simply support these pre-existing behaviors.
2. **Reinforce trust by supplementing relationship information (which can be fleeting) with input derived from reputation and/or process-driven systems.** While trusted relationships can make for a stronger community, when community members move, the trust leaves with them.
3. **Use consistent behaviors.** Behaviors need to align with what the company is saying and portraying: this is not just a PR exercise. If users feel that a company is being insincere, they will take issue with it publicly. If you do something wrong, don't apologize unless you mean it and can take immediate action that produces tangible results.

Process

1. **Be open, transparent and honest. Keep the process simple and easy to use and understand.** If a process is too complicated, it won't be used. It's also important that users understand how the system is governed—transparency creates trust by allowing users to understand how the enterprise operates and infer its intentions.
2. **Constantly improve the system to make it more robust.** Small changes may have huge effects and wherever there are gaps, people will be looking to take advantage of them. With process-based trust, architecture concerns and incentives for successful gaming rise to an entirely different level. The most successful

processes are those in which the issue of trust doesn't cross users' minds. They simply use the system based on an understanding that it is robust enough to withstand harmful behaviors.

3. Use a **“laissez faire” strategy if it suits your goals and needs.** Sometimes it's best to create the community and let it develop on its own. Good trust systems are self-governing and offer little intervention from the company itself.

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References

1. Chevron Texaco Different between revisions. (2004). <http://en.wikipedia.org/w/index.php?diff=prev&oldid=6911356>.
2. Chu, Kathy. (2007). Alternative lending sties often have good deals. USA Today. http://www.usatoday.com/money/perfi/credit/2007-12-25-peerlending-pers_N.htm.
3. De Alfaro, Luca. (2007) Wikipedia Trust Coloring Demo. http://wiki-trust.cse.ucsc.edu/index.php?title=Politics_of_Denmark&direction=next&oldid=77697234.
4. Diebold Difference between revisions. (2005). <http://en.wikipedia.org/w/index.php?diff=prev&oldid=28623375>.
5. Donovan, John. (2007). LendingMatch: Our secret Sauce. LendingClub Blog. <http://blog.lendingclub.com/2007/06/02/lendingmatch%e2%84%a2-our-secret-sauce/>.
6. Facebook Press Room. <http://www.Facebook.com/press/info.php?statistics>.
7. Finextra.com. (2008). Banks facing increasing competition from social networks - Gartner. <http://www.finextra.com/fullstory.asp?id=18049>.
8. Fulgoni, Gian. (2007). Consumer Trends in Social Networking. http://www.comscore.com/blog/2007/10/consumer_trends_in_social_netw.html. Accessed October 30, 2007.
9. Griffith, Virgil. (2007). WikiScanner FAQ. <http://virgil.gr/31.html>.
10. iLike blog. (2007). Holy cow... 6mm users and growing 300k/day. http://blog.ilike.com/ilike_team_blog/2007/06/holy_cow_6mm_us.html.
11. Information Commissioner's Office. (2007). Social Networking Press Release. http://www.ico.gov.uk/upload/documents/pressreleases/2007/social_networking_press_release.pdf.
12. Intruders TV interview. (2007) Interview with Ali Partovi, founder of iLike: the most popular application on Facebook. http://ie.intruders.tv/Interview-with-Ali-Partovi,-founder-of-iLike-the-most-popular-application-on-Facebook_a134.html.
13. Ives, Bill. (2007). Worklight Enters the Enterprise Facebook Market. The FASTforward blog. <http://www.fastforwardblog.com/2007/12/20/worklight-enters-the-enterprise-facebook-market/>.
14. Lending Club website. www.lendingclub.com.
15. LendingStats, Prosper Loans Funded. <http://www.lendingstats.com/loansFunded>.
16. LendingStats, Prosper Membership Growth. <http://www.lendingstats.com/membership-Growth>.
17. Microsoft Most Valuable Professional, Frequently Asked Questions. <http://mvp.support.microsoft.com/gp/mvpfaqs>.
18. New Paradigm e-mail interview with Ali Partovi, iLike founder and CEO. January 25, 2008.
19. New Paradigm e-mail interview with Anton Wenzelheumer, SDN Top contributor – T-Systems, November 21, 2007.
20. New Paradigm interview with Eric Johnson, SDN Top contributor – Capgemini Consultant, November 6, 2007.

21. New Paradigm interview with Erik Moeller, Deputy Director, Wikimedia foundation, October 24, 2007.
22. New Paradigm interview with Giles Andrews, Managing Director, Zopa UK, October 24, 2007.
23. New Paradigm interview with Jennifer Golbeck, September 21, 2007.
24. New Paradigm interview with John Donovan, Founder & CEO of Lending Club, October 19, 2007.
25. New Paradigm interview with Luca de Alfaro, UCSC Wiki Lab, September 21, 2007.
26. New Paradigm interview with Natty Gur, SDN top contributor, November 9, 2007.
27. New Paradigm interview with Shawn Broderick, CEO Trust Plus, October 3, 2007.
28. New Paradigm interview with Will Shaver, Trust Gradients, September 18, 2007.
29. Ostrow, Adam. (2007). Salesforce.com Application for Facebook. <http://mashable.com/2007/09/13/facebook-salesforce/>.
30. Perez, Sarah. Social Tools Go to Work... Facebook, MySpace, Netvibes, iGoogle, and More in the Enterprise. Read Write Web. http://www.readwriteweb.com/archives/social_tools_go_to_work_in_the_enterprise.php.
31. Rosenbloom, Stephanie. (2007). On Facebook, Scholars Link Up with Data. The New York Times. <http://www.nytimes.com/2007/12/17/style/17facebook.html?pagewanted=print>.
32. SDN email update.
33. Shaver, Will. (2007). Wikipedia Trust Gradients. <http://primedigit.com/wikifix/>.
34. Shih, Clara. (2007). Faceforce flash demo. <http://www.thefaceforce.com/demo/Faceforce%20-Demo.swf>.
35. Walker, Tim. (2008). The Googles of tomorrow. Independent.co.uk. <http://www.independent.co.uk/life-style/gadgets-and-tech/features/the-googles-of-tomorrow-787804.html>.
36. Tapscott, Don and Ticoll, David, *The Naked Corporation How the Age of Transparency Will Revolutionize Business*, (Toronto: 2003).
37. WorkLight Solutions. (2007). WorkBook: A Secure Corporate Overlay for Facebook. <http://www.myworklight.com/currentPage.aspx?catid=69&pageid=93>.