TOWARD A DIGITAL TRUST FRAMEWORK

by

TIMOTHY GRAYSON

Abstract

A key requirement for expanding online commerce in quantity and *quality* is trust. In the digital world, an extra-elaborate trustworthy structure has to evolve to compensate for an *absence* of trust among the distant and detached participants. The trust framework that will increase the acceptability and transactional value of commercial transactions consists of two sets of features. First, the primary factors associated with business activity in any context: *Privacy* and *Security*, which create *Credibility*. To support this structure in the online world where projected – or derived – trust is required of a third party is a secondary set of four additional factors: *Authenticity*, *Attestation*, *Mediation*, and *Responsibility*. While there may be many other reasons for having trust permeate the digital environment, the primary reason for propagating trust is to reduce transaction costs. Creating this trust framework must be an imperative of all online participants and beneficiaries, if their objective is long-term growth.

I. Introduction

A key requirement for expanding online commerce in quantity and *quality* is trust. Essential are trust among participants, trust in the technology, and trust with the integrity of both the medium and transaction. In the digital world, however, an extra-elaborate trustworthy structure has to evolve to compensate for an *absence* of trust among the distant and detached participants. The desired result is a structurally more robust and certain online experience. Creating this trust framework must be an imperative of all online participants and beneficiaries, if their objective is long-term growth. It is also a necessary condition for future cost reductions.

II. Trust and Social Capital

Trust is amorphous: at once both pliable and brittle. It is, according to expert Trudy Govier, "an attitude based on the past and extending into the future; it reduces the complexity of the world for us, but leaves us with some risk."[1] Trust is essential to the efficient activity of an economy or other social system; without it a system is burdened by skepticism, uncertainty, and friction, all of which constrain and may even destroy it (witness the Soviet economy leading to the 1980s).

Trust is at least twice frustrating. First, it "is really a composition of many different attributes: reliability, dependability, honesty, truthfulness, security, competence, and timeliness, which may have to be considered *depending on the environment*."[2] [italic mine] In other words, trust is contextual, derivative, and, in the virtual environment, extremely difficult to lay hands on. Moreover, "trust and distrust are often relativized to specific roles or contexts. . . . Trust on the whole does not mean trust in every context."[3] It changes. So, despite being reducible to a relatively few number of attributes, trust remains quite complicated.

Trust is frustrating a second time because it "is understood by most consumers to be a dynamic process. Trust deepens or retreats based on experience."[4] Trust is like a breeze: it can be felt and harnessed, but can't be held. It must be earned and earned again. Which is not to say that it is perpetually in renewal from zero. Rather, like income, what was previously achieved could be the benchmark from which trust "earnings" grow or decline.

Even more than increasing trust levels, declines are infectious. Govier notes that, "Distrust readily seeps from one context to others. Such seepage of distrust is quite natural, but easily destructive to relationships."[5] And, as if to prove it, renowned expert, Robert Putnam, notes that, "The GSS [General Social Survey] demonstrates . . . a drop of roughly one-third in social trust since 1972."[6] Such a circumstance neither says much about who we're becoming nor bodes very well for the future. Our world becomes unnecessarily complicated, and, as we'll see, expensive.

Trust and Transaction Costs

Although trust's conceptual importance may seem elementary, less obvious is its tangible commercial value. Above all else, trust reduces transaction costs. As Francis Fukuyama noted in his 1995 book, *Trust: The Social Virtues and the Creation of Prosperity*:

> *. . . people who do not trust one another will end up cooperating only under a system of formal rules and regulations, which have to be negotiated, agreed to, litigated, and enforced, sometimes by coercive means. This legal apparatus, serving as a substitute for trust, entails what economists call "transaction costs."*[7]

Recall that reduction of transaction costs was a driver behind 20th-century industrial conglomeratization. The merging of

independents into General Motors and, moreso, the rampant vertical integration of the period are examples. By internalizing transactions, these larger organizations reduced internal transfer costs. Similarly the Japanese keiretsu create competitive advantage by severely reducing transaction costs as a result of strong trust relationships. Suffice it to say that there is a value that can be assigned to "trust" in the form of transaction costing.[8]

A recent North American business trend is divestiture of non-core activities. This drive has pushed the norm toward outsourcing of any and all corporate competence. No doubt there are good philosophical reasons for the shift. But the strategy works at a financial level only if transaction costs for the previously internal activities and relationships are *at least* not higher than when the functions were internal. By inference, high levels of trust are a condition for success.

While it may be working as expected, outsourcing in practice could very likely be an illusory economy. That is, the real transaction cost impacts may yet prove to be higher than before. The causes could include litigation, sectoral economic slowdowns that pressures ability to deliver, and quality deterioration, among other things. After all, a condition for success (trust) is decaying (see Putnam). The situation now is, in any event, more precarious and has a higher potential for a cascading increase of transaction costs.

Sociologist James Coleman defines social capital as, "the ability of people to work together for common purposes in groups and organizations."[9] It is a complement to *human capital*, a well-understood concept that starts from the premise that "capital today is embodied less in land, factories, tools, and machines than, increasingly, in the knowledge and skills of human beings."[10] Again, like human capital and trust, social capital is effectively an economic factor of production, albeit an intangible one. And, while it can be classified as an asset or (in its deficiency) a liability to any social system at any time, social capital may be of particular, growing relevance in the 21st-century.

The growing importance of social capital, and hence of trust, is a result of the *knowledge* economy being founded on the knowledge held by and expanded among *people*. Moreover, as the word suggests, it has everything to do with the effectiveness of *social* connections among people. The value of social capital is that relationships tend to be more effective, productive, and profitable in direct relation to the level of the parties' social capital holdings. And, as we have seen, trust – which is an important lubricant of the social system – is a necessary determinant of the degree of social capital. All to say that trust is a key economic factor not just a pleasant social virtue.

III. Derived Trust

Let's turn our attention to how trust and social capital are manifested in and impact upon commercial affairs in the digital world. It would seem that these social virtues cum economic factors are even more important in the virtual space than the physical because of the added environmental challenges. These include the need for technology to create and foster a secure environment and for policies to direct the practice of privacy. Moreso than in the physical world, a reliable third party may have to project its trustworthiness onto the willing but unknown participants.

"Derived trust" is how I'll refer to the effect I'm about to describe. It's hardly a new concept, having mathematical roots in the associative property. The salesman's holy grail, the referral, is built squarely on derived trust; brand-based consumer choice is a derived trust action in many cases. Derived trust is an *important* fact of traditional commerce and is proving to be an *essential* element of online commerce.

For derived trust to be relevant and work, several conditions must be met. First, the parties must be interested in a transaction but

unknown to each other and structurally prevented from knowing the other's good will. Which results in: second, sufficient direct trust between the parties must be absent. Third, there must be a burdensome or economically infeasible transaction cost to the absence trust between parties. Fourth, an intermediate third party known to the primary actors that can be trusted to either vouch for the parties or otherwise reduce the transaction cost must be available.

Conditions one and two are assumed to exist in all first-time and distant transactions. The third condition – burdensome transaction cost – is relative. That is, the burden is acceptable or excessive relative to the value of the underlying transaction. A large transaction would make lawyers, letters of credit, escrows, and other protections worthwhile. For a smaller transaction (e.g., a $500 eBay purchase), the costs of achieving the same certainty would be overly burdensome.

The trusted third party addresses condition four. This could be a mutual acquaintance making an introduction and assuring each party of the others' quality. Often, such as in the case of escrow or letter of credit, it is a lawyer or financial institution. The most formal manifestation is the notary who vouches to the authenticity of a document or intent or, in the case of a passport application, of the person's identity.

The concept of borrowing or *using* someone else's social asset for our purpose is common. The goal is often to use this *derived* trust to sow the seeds of a new trust relationship that can grow on its own, eliminating the need for the derived trust in the future. Where such a new trust relationship can *never* fully supplant the caution of alternate support(s), derived trust has to be institutionalized. We noted that facilities such as escrow and letters of credit exist for just such reason. The rapidly evolving digital environment requires a robust, consistent, and perpetual means of using derived trust to support the broadening and acceleration of electronic economic activity.

IV. A Trust Framework for e-Business

Trust is an essential ingredient of business if for no other reason than it reduces transaction costs with or without formal legal frameworks in place. As Fukuyama notes:

> *Law, contract, and economic rationality provide a necessary but not sufficient basis for both the stability and prosperity of postindustrial societies; they must as well be leavened with reciprocity, moral obligation, duty toward community, and trust, which are based in habit rather than rational calculation. The latter are not anachronisms in a modern society but rather the sine qua non of the latter's [sic] success.*[11]

In Western society, the trust framework is built upon cultural factors that can be reduced to the aggregate categories of *Beliefs* and Values. The beliefs and values that inform the framework are a fluid blend of religious and secular; the incarnations of an evolutionary process that is as young as pop culture and as old as community. A newer set of values is the capitalism of Mill (or consumerism); the Ten Commandments well represent those of greater longevity. These influences co-exist and must resolve into a prevailing set of overriding beliefs and values.[12]

But business demands more than fundamental beliefs and values. For commercial affairs – particularly e-business – a simple trust framework could be presented in the form of a structure of three additional factors resting atop a *Beliefs* and *Values* foundation. In this metaphor the qualities of *Privacy*, *Security*, and *Credibility* form a superstructure on which rests commercial success. Note that *Credibility* is substantially supported by each of *Privacy* and *Security*. *Credibility* may be raised by one or the other, but it will not last long without both. Figure 1 depicts the commercial trust framework being

described. The three structural qualities are described below.

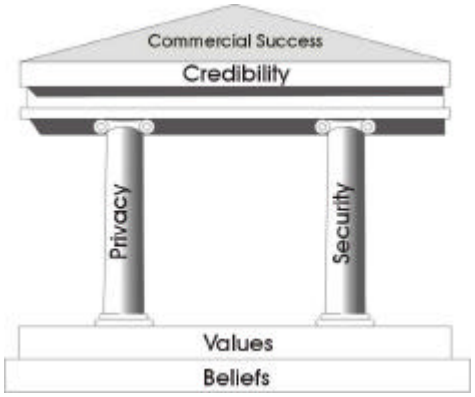

Figure 1

Security refers to protection from harm. That could mean physical harm resulting from doing business with another, such as being in a safe neighbourhood with a well-maintained building or refraining from unsavoury activity that might cause harm to customers. In the electronic world it typically refers to an assurance that customer information is secure from intrusion. Encrypted transmission and protected servers achieve much of this security.

Privacy is different from security. We expect our dealings and data to remain privy to only those of us "in the know" and certain others. We expect no discussion of our business and, if online, assume all necessary measures are taken to ensure the technology does not leak information. Moreover, we expect that others will not use privileged information against us.

Credibility is the result of continued successful interaction that creates then reaffirms a contextually adequate level of trust. Relationships propagated from a "credible" position develop at an advanced stage, avoiding the more tentative (risky and higher-cost) iterations. In the commercial world, credibility is often manifested in reputation and brand strength.

This framework assumes infinite patience and willingness to test and develop a trust relationship among parties. As pointed out in many places, however, the Internet grail is open business around the world. So the distance between parties grows and, with alternatives, the likelihood of continuation and recurrence of unique relationships diminishes. The result would be insufficient interaction among parties to create trust and credibility holistically. In practice then, for e-business this basic trust framework likely comes up short.

Historically, every other time that distance or detachment between parties increased, some external party or technology was required to lubricate the commercial process. The online experience appears to be no different. Derived trust projected into these nascent digital relationships would serve to move transactions up into the *Credibility* space. In the past a trusted third party has been the common link. Notwithstanding the legal ramifications and liability transference, any act of backstopping a commercial transaction has the same effect: one party brings its own credibility to bear for an immediate, higher-level acceptance and *trust* between other parties doing business together. However, the rapidly evolving electronic environment, while not nearly as radically different as we were once led to believe, has certain special, added structural requirements of a trust framework.

With this in mind, the commercial trust superstructure of Figure 1 could be further supported by a trusted third party that imposes upon it four additional support pillars: *Authenticity*, *Attestation*, *Mediation*, and *Responsibility*. A third party will not be effective with merely the first three trust factors described above (*Security*, *Privacy*, and *Credibility*) because it makes assurances of a different kind, augmenting rather than supplanting the essential bilateral trust relations between the parties. The primary superstructure of *Security*, *Privacy*, and *Credibility* does, however, remain essential. It can be neither replaced nor omitted, only supported.

These additional qualities accelerate e-business by creating a "trustworthy" online environment suitable for the conduct of much

more sophisticated and valuable, multi-iterative transactions. Ironically, it is possible that this structure would ultimately be temporary (i.e., in the next transaction, the third party's involvement may not be necessary). In other words, while there may be limited potential for *spontaneous* trust between unrelated parties online, a third party can lay over the transaction its own aegis of trust more *institutionally* to jump-start a bilateral trust relationship – or replace it altogether. The four additional factors in the digital trust framework are described below Figure 2.

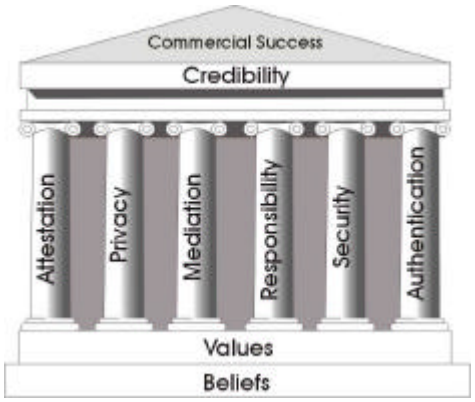

Figure 2

Authenticity here refers to the process and act of assuring that a thing is what it purports to be. Only a third party can do this with the independence and detachment necessary for it to be meaningful. A complication in the online world is that credentials which support authenticity are presently few and far between, which may be due to the limited number of organizations that could provide such a solution across a broad tract of geography. Moreover, it is difficult to rigorously authenticate outside the enterprise environment.

Attestation is, online and off, stating the truth as a witness. The role requires independent witness of an activity followed by unbiased verification of it. It keeps all parties honest prior to and though a transaction. Naturally, the online environment presents complications that make attestation more relevant. For example, parties to an online transaction may never meet nor conduct another transaction together again. This environment creates a higher potential for misinterpretation and dispute. A third party providing independent attestation could relieve the system of substantial burden.

Mediation is a natural extension of attestation. In this context it is the third party orchestrating and possibly recording the flow of multi-party, multi-iterative electronic transactions to maintain an accurate chronicle. Mediation also implies the act of bearing witness in the resolution of disputes. The value of this activity is in both the security it affords all parties and the respect for the rules it engenders.

Responsibility is the third party's willingness to accept the liability that comes with making trust assertions. There is limited value in the vouching for a party's authenticity or in attesting to records if one doesn't or won't accept the consequences of error. While the trust framework for e-business may support transaction credibility without the trust-projecting third party formally accepting responsibility, the value of the third party's participation increases if it takes on that liability.

Collectively these factors give transactions greater integrity. More specifically the functions of *Attestation* and *Mediation*, which require the technological capability to securely archive transactional artifacts in time, do so for at least two key reasons. First, there is no alternative strong means to introduce and manage a transaction life-cycle online, including the discovery and prevention of misrepresentation and fraud. Second, without these two functions there exists no strong means to resolve online-originating disputes based on legally-acceptable evidence presented by an unbiased witness. This makes them the foundation for non-repudiation and notarization services for digital activities.

V. Summary

For the digital world, the trust framework that will increase the acceptability and transactional value of commercial transactions consists of two sets of features. First, the primary factors associated with business activity in any context: *Privacy* and *Security*, which create *Credibility*. To support this structure in the online world where projected – or derived – trust is required of a third party is a secondary set of four additional factors: *Authenticity*, *Attestation*, *Mediation*, and *Responsibility.* Resting atop a foundation of core cultural *Beliefs* and *Values*, I believe these represent a trust framework for the digital world.

While there may be many other reasons for having trust permeate the digital environment, the primary reason for propagating trust is to reduce transaction costs. Reduction of transaction costs makes commercial activity more efficient. The special requirements of the digital milieu demand special structures embodied, at least philosophically, in a robust trust framework. Such a framework is, therefore, an essential requirement for the reduction of transaction costs in online activity which is, in turn, a condition of the expansion of digital activity, particularly commerce.

XXX

---

[1] Trudy Govier, *Dilemmas of Trust.* McGill-Queen's University Press, 1998. http://www.mqup.mcgill.ca/xtgov2.htm

[2] Tyrone Grandison and Morris Sloman, "A Survey of Trust in Internet Applications." *IEEE Communications Surveys*. Q4, 2000. p. 3.

[3] Trudy Govier, "Trust, Precarious Treasure." http://eon.law.harvard.edu/trusting/govier.

[4] Cheskin Research and Studio Archetype/Sapient. "eCommerce Trust Study." January 1999. p. 8.

[5] Trudy Govier, "Trust, Precarious Treasure." http://eon.law.harvard.edu/trusting/govier.

[6] Robert Putnam, "The Strange Disappearance of Civic America." *The American Prospect*. Vol. 7, Issue 24. December 1, 1996.

[7] Francis Fukuyama, *Trust: The Social Virtues & the Creation of Prosperity*. The Free Press, 1995. p. 27.

[8] Economist Kenneth Arrow has this to say. "Trust is an important lubricant of a social system. It is extremely efficient; it saves a lot of trouble to have a fair degree of reliance on other people's word. Trust and similar values, loyalty or truth-telling, are examples of what the economist would call "externalities." They are goods, they are commodities; they have real, practical, economic value; they increase the efficiency of the system, enable you to produce more goods or more of whatever values you hold in high esteem." Kenneth J. Arrow, *The Limits of Organization*. Norton, 1974. p. 23.

[9] James S. Coleman, "Social Capital in the Creation of Human Capital," *American Journal of Sociology* 94 (1988): S95–S210. See also Robert D. Putnam, "The Prosperous Community: Social Capital and Public Life," *American Prospect* 19 (1993): 35–42; and Putnam, "Bowling Alone," *Journal of Democracy* 6 (1995): 65–78.

[10] Fukuyama, p.10. Originally sourced from Gary S. Becker, *Human Capital: A Theoretical and Empirical Analysis*, 2d ed. (New York: National Bureau of Economic Research, 1975).

[11] Fukuyama, p.11.

[12] In business, for example, Fukuyama sees that, ". . . although property rights and other modern economic institutions were necessary for the creation of modern businesses, we are often unaware that the latter rest on a bedrock of social and cultural habits that are too often taken for granted. Modern institutions . . . have to be combined with certain traditional social and ethical habits if they are to work properly." Fukuyama, p. 150.