

# Take it on trust

# TRUST METRICS

LUKE KENNETH CASSON LEIGHTON



You may think word of mouth is enough, but does it quickly tell you everything you need to know?

Can word of mouth be automated by a computer? Can word of mouth be digitally signed?

The practice of finding resources for every day business and personal issues is so common-place that no-one has considered what it might be like to have the same capability available to them via the Internet. Trust Metric Evaluation is likewise a simple concept: it allows for the automated evaluation of people's opinions - in a *Web of Opinions*, with far-reaching consequences for the day-to-day way in which we conduct our business, across the world.

Trust Metrics is a means to evaluate a chain, or web, of opinions. Evaluation of a *Web of Trust* requires that you specify whom you trust implicitly for opinions. This becomes the centre of your web - the seeds. The seeds have specified their opinions of other people, or the things that other people have done, said, written, performed etc., and then those people have specified their opinions etc. Trust Metric Evaluation limits the chain of 'opinions of opinions' as it were, resulting ultimately in a means to provide an unbiased, verifiable, and reasonably impartial appraisal.

The only way for an individual to receive a better evaluation is to actually do something that is worthwhile for someone who is reasonably close to the centre of the *Web of Trust* to express their opinion of them or their actions. Equally, if they do something contrary to the trust that has been placed in them, the opinion can just as easily be revoked...

Imagine that you require the services of a financial advisor. You have no idea how to go about this or who to trust. So, you go to

**You are looking for a recommended financial advisor. Who do you trust to tell you which one is well informed and impartial: their clients or other advisors, your friends or an independent financial agency? Do you trust those recommended opinions? How do you evaluate those opinions and what weight should you give them?**

*myfavouritefinancialadvisors.com* and lo and behold, they are running Trust Metric evaluations of financial advisors. Other financial advisors, their clients, and the Independent Financial Advice Bureaus of 15 U.S. States and 10 separate countries across the world are involved with this site, expressing their opinions as to the reliability of the advice given by the financial advisors listed on the site.

You conclude, "hmm: I only really trust Independent Financial Bureaus, but there was a scandal with one of them recently, so I am not interested in their opinions". So you select seven bureaus you've heard of, and seven that you haven't, as the *seeds* for the Evaluation you wish to perform. Setting these 14 bureaus at the centre of your *Web of Trust*, you ask the site to perform an evaluation. You ask it to list the top 100 financial advisors it can come up with, that have had *Reliability* opinions expressed on them from at least two bureaus, four of their peers, and at least five clients. You wait a few seconds, and lo and behold, there are only 10 financial advisors that meet your exacting requirements.

Well, that's good enough to start with. So, you start to explore these people a bit more, browsing their credentials online. Click click hmm, funny: five of them all seem to work for the same company. Ah, but wasn't there some sort of financial irregularity about that company in the news, recently? Whoops, don't think I'll be using them! Ahh yes - I see why they came up so high in my criteria. A number of their former clients have made use of this site to express their dire opinion of this company's activities. Oh dearie me, it looks like the bureaus haven't got round to revoking their certifications of these people yet. Ah well. Maybe they are trustworthy, but I'm not using them.

Click, what about this one? He's a small-time financial advisor, but he has ratings from (click click) five Bureaus that say that he gives sound advice and some of his peers have also rated him as very good. Let's see - yes, they too are all rated by at least two of the original 14 bureaus I specified as the seeds, and he has reports of quite varying degrees from his customers. Yes, they're all pretty good, except for one

client who says his advice was completely useless: must ask him about that if I ring him. Where's his telephone number (click), ah yes, here it is.

This is such an incredibly powerful and liberating example of the use of computing that it is in some ways quite frustrating to know that, though it is technically possible, Trust Metrics are only being used in experimental ways at sites such as [advogato.org](http://advogato.org), [skolos.org](http://skolos.org), [sourceforge.net](http://sourceforge.net) and a few others.

The possible applications and potential of Trust Metrics are quite amazing. For example, it can be used as a search engine - one that you can actually trust because it gives you an impartial amalgamation of other people's evaluations. And as if that isn't enough, where you absolutely have to know that the opinions being expressed are real and concrete, why not have the people who enter in their opinions into the Trust Metric Engine digitally sign those opinions? That way, any opinions that are not digitally signed - and verifiably digitally signed - can be automatically excluded when the Trust Metric evaluation is performed.

Combining Trust Metric evaluations with Digital Signatures leads to interesting possibilities. Imagine that you request a Trust Metric evaluation, but you do not really trust the computer performing the evaluation to give you the right results. You ask the engine to give you a digitally signed copy of the results, along with the original *Certification Web* from which it performed the calculation. You can then give that to another Trust Metric evaluation engine and ask it to double-check it! Not only that, but imagine that there is a Certification type which can be applied to evaluation engines, which certifies them as to the reliability of those engines to perform evaluations. This process of cross-checking could even be automated, by the Engines themselves, which would be essential in a distributed Trust Metric environment.

There are field-based military intelligence applications for Trust Metrics, too. Imagine that all sources assess each other as to the reliability of the information coming from their peers. A source out in the field is cut off from communication with their usual base, which they would normally use as their seeds for the centre of the *Web of Trust*. They still need some assessment as to the sources available to them. So they select the sources closest and most trusted that they are still able to contact and ask for a Trust Metric evaluation of their immediate environment. Untrusted sources not linked to the trusted seeds via the *Web of Trust* are automatically excluded. Compromised sources which provide false information are soon discovered by their nearest peers who act on that information, and upon discovering that a source has been compromised, they immediately revoke their *Reliability* Certification, with the result that the compromised source is quickly excluded.

A slightly different version of this approach was the original reason behind the development of Trust

Metrics: to solve the problem inherent with trusting certificate authorities, and to provide a more secure, trustworthy and scalable way to handle DNS Domain Name Registrations and Updates. The problem at the moment is, can you really trust the Public Key Certificate Authorities, especially given that very recently, someone fraudulently obtained a Digital Certificate that allowed them to digitally sign Active-X components as if they were Microsoft.com? Active-X components are downloaded and run automatically on Internet Explorer - if they are signed by one of the *Trusted* Certificates.

What alternatives are there? Trust Metrics. Bruce Sterling's Science Fiction novel, *Distraction*, describes a reputation-based nomadic community that actually uses digitally-signed Trust Metrics in order to evaluate who should be given responsibility to lead the community. The better the individuals actually fulfill the role assigned to them, the more Trust Certifications they will receive by their community peers, and the more responsibility they gain. Abuse of the trust placed in them results in their certifications being revoked, and they are relieved of their position. The interesting thing is that, as mentioned in Bruce Sterling's book, there is almost always more than one possible candidate for a particular leadership role, as recommended by the Trust Metric Evaluation. This makes people interchangeable, and therefore replaceable, and therefore less likely to abuse their position. Especially as the certification records are digitally signed - forever. Bruce Sterling's book also makes it clear how pointless it is for an opposing organisation to attempt to target, persecute and remove individual leaders from such a community, as alternative candidates for exactly the same job are just one or two steps down the Trust Metric list...

The key strength of Trust Metrics is that they rely on peer-evaluation, as opposed to centrally, implicitly trusted evaluation. With *centrally-controlled evaluation*, trust begins to wear a little thin, and ultimately carries less and less weight as the size of the community the centrally-controlled authority serves grows ever larger: ironically, it becomes something of a contradiction in terms to trust a centralised Trust Authority. As the size of the community they serve grows, the *trust* required to bolster their position may lead the organisation to extreme measures that are way out of line, way out of proportion, which compromises their integrity and effectiveness but still maintains their position. We can see this quite clearly for ourselves out of the numerous over-bureaucratic or over-zealous organisations in the world that could be cited as perfect examples.

With digitally signed Trust Metric Certifications, other than the limits of the capacity of the computers used to perform the evaluations, the ability to perform reliable evaluations scale as the size of the community grows to world-wide proportions, and you still get answers that you know you can trust. ■

