MEANINGFUL METRICS FOR A SMART SOCIETY

The Basic Concepts of True Value Metrics

CHAPTER 7
ENABLING
TECHNOLOGY

DISCUSSION DRAFT
Peter Burgess

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Chapter 7-1

Amazingly Powerful Technology

This chapter does not set out to summarize the state of technology ... merely to highlight the impressive power of modern information technology and to invite an ongoing collaborative partnership between those with an interest in data and socio-economic performance analysis and those with an understanding of what is possible with modern technology.

Moore's Law and All That!
Rapid changes ... huge power

The technology is changing very rapidly. TVM is committed to the best possible use of technology in association with data that are designed to be useful for better decision making for society.

In many ways the performance of TVM is independent of technology … but the rapid pace of computer science innovation suggests that the basic data model for TVM will be superceded in due course by something based on better use of technology that cannot be envisioned at this stage.

Technology has changed a lot in the last fifty years … and a lot in the last five years. Technology is changing fast ... very fast … and accelerating. Rapid changes in technology are changing the economics of some parts of our society, but not always in a useful way. The possibilities of technology are not yet being well used for the benefit of society as a whole, and especially, not for the benefit of those that are at the bottom of the pyramid (BoP).

Productivity ... facilitating paradigm shift

Knowledge ... technology ... application of science in appropriate ways results in productivity ... and productivity makes it possible to have a surplus producing society or community.

Throughout history technology has always been the primary limiting factor in making sustainable progress ... or to put it another way, development of technology has made it possible to do better things ... pump water, deploy the wheel, grow more food, access more power (steam, nuclear, electricity, communicate widely, etc). The acceleration in the progress of technological innovation in the last few decades makes it possible for all of society to have access to the good things of life ... but the social and economic system does not allow this to happen.

TVM is about data much more than about technology. The ideas of TVM were applicable when paper was the storage medium, and the same ideas still have application in a fast moving digital age. TVM was designed to be independent of technology ... the data are a logical framework that does not need technology ... but these data become a million times more powerful when matched with the capabilities of technology.

Computational power ... unproductive data

Data collection workbooks are used so that data collection is very efficient using the relational model, and for efficient data acquisition using mobile phone SMS data transmission. Technology for data collection is advancing into the 21st century ... but the mindset about using data for important things remains in the stone age! People change slowly! There are many possibilities for the use of technology to help with data collection ... and what is used should be what is most cost effective. The best technology from the technical standpoint is usually not the most cost effective.

Over the past 50 years there have been, inter alia, manual systems, mainframe computers, personal computers, client server systems, Internet based systems and mobile cell phone systems. Analog has changed to digital. Character based communication systems (typewriters and telex) have been supplemented by images and audio and video. The technology has increased in capability and the cost has decreased amazingly ... and the opportunity to do amazing things exists for us. We are constrained by our vision, our imagination and our organization.

Chip technology has made all sorts of things possible. Computational power has increased exponentially for many years and the potential is a long way from being fully utilized.

> Moore's Law talks about computational power doubling every 18 months and costs halving every 18 months. This ideas now goes back almost 30 years ... the impact on information processing is staggering.

Stationary centralized computational systems have given way to distributed systems ... to the Internet and to mobile systems. The power has gone up and the costs have come down.

> If the cost to power relationship has improved by a factor of 1 million over the past 40 years ... how come a data centric profession like accountancy are not a million times more useful? Why has so little of the potential been used for public good?

It really is a disgrace that with so much computational power, society has progressed to such a limited extent.

Using the Power of IT
Information Infrastructure

The power of modern IT is amazing … but not used to anywhere near its potential for the benefit of society as a whole

> **The Power of IT**
>
> The power of modern information technology (IT) is a million times more than fifty years ago … yet the available metrics about socio-economic performance are not much different. The power of IT has compensated for the lack of data, rather being used to do critical valuable analysis on top of better data of importance. Analysis, decision making and accountability are not yet in the modern era!

The potential impact of TVM is difficult to imagine … to articulate. The impact of TVM were it possible for anyone and everyone to participate in TVM dataflows and analysis in

the same way that they are able to participate in modern social networks like Facebook or access value metrics as easily as information are retrieved from Google or passed around via Twitter. For Facebook and Twitter … less so Google … the purpose of their platforms is about social interaction and entertainment. Use similar technology and the TVM construct of true value metrics and society can be a better place.

I get some satisfaction from the effort associated with the creation and development of but this is inconsequential. But the goal is timely useful decision data in use by decision makers to make better decisions and others to ensure the accountability of decision makers for their performance … and for global society to have a measurably improved quality of life.

Technology is very powerful … and not at all well used for the benefit of society as a whole. This is a disgrace, but perfectly understandable when the only economic and social metrics that are widely used are those that relate to money and wealth.

Internet … WWW

While TVM is built on concepts that were applicable for pre-computer accountancy, the architecture of the data also works for an electronic environment and Internet accessible data and analysis. As Internet technology has evolved, the need for and use of "broadband" has increased, and most applications now require broadband access for the Internet to be an efficient tool. This has the effect of making the Internet a limiting factor for the universal deployment of TVM. The combination of Internet and other technology driven tools now makes data centric programs cost effective.

Social networks

The idea that platforms like Facebook and Twitter can emerge in the Internet space over a period of a few short years and engage hundreds of millions of people is cause for some optimism. At the same time it is worth noting that many thousands of similar initiatives have failed doing things that are quite similar.

The idea of the social network is relatively simple … it is about friends and being in contact with ones friends in a very simple and convenient way. It is flexible and the interaction with friends is subject to few constraints … a good feature most of the time, but not all of the time. The Internet with PC access was the initial driver of the social network phenomenon, but the paradigm has already shifted to the mobile platform so that virtual network connections may now take place any time almost anywhere.

Facebook was originally populated by friends in the university setting … this then expanded to other younger people, the "millenials", those born after the Internet and the mobile phone became commonplace. Now older people are engaging with Facebook as well as corporate enterprises, entertainment stars, political figures and everyone else seeking recognition in some form or other.

TVM is joining in with a Facebook presence … a Twitter network … blogs … and branding. Without these TVM will be just another idea that does not achieve very much. With these modern tools of communication, it is possible that TVM can make more progress in improving socio-economic metrics in two years than the economics and accounting professions have done in two hundred years! This is not a preposterous claim about TVM … but a realistic claim about the potential of modern technology for promulgating ideas and information.

Mobile technology

Mobile technology is doing to PCs today what PCs did to mainframes thirty years ago … maybe faster and with more impact for society. It took a long time for PCs to move beyond the relatively affluent to a larger and poorer segment of society … but the mobile

phone has done that way faster than anyone really expected. Mobile phones are everywhere, in surprisingly remote areas with connection to everywhere.

> The modern mobile phone has hundreds of times more computing power than the big mainframe computer I helped install in the 1960s and I believe more computing power than was used to fly the Apollo Moon Missions. I worked for the company that did the communications technology for that program … and yes, it used computers … but very weak and clumsy by modern standards!

Data is now working on top of the basic mobile infrastructure … and at very modest cost. The price being charged for the service is not always modest … in fact some of the price plans for mobile services are very high.

Whether mobile phone service providers will operate in a manner that is pro-profit mainly or pro-society is not at all clear. The issue has not yet become a widely reported confrontation between the people that invested in building the infrastructure and the people who have a responsibility for regulating the industry and industry oversight.

The Cloud

Technology has developed from a simple filing cabinet … through punched cards and paper tape … to magnetic tape and discs … to hard disks and solid state storage devices … and now to huge web accessible data-stores that are unimaginably large!

Technology is not the problem … facilitating its cost effective use is the challenge.

And all sorts of other technologies

The pace of technological innovation shows no sign of abating … and if we can bridge the divide between what is being done with data and what could be done with data it is amazing to contemplate!

Low cost data acquisition and accessible data

Specialized PDAs (personal digital assistants) have been used for a number of years (since around 1995) to reduce the burden of paper based data in mobile situations. Organizations like Federal Express and UPS were early adopters of this specialized technology, and it has been adopted for many applications where accuracy and speed are important (for example inventory control). The use of a PDA is cost effective when labor costs are high and the use of data has a high value. PDAs are rarely low enough in cost to be of advantage in low wage settings ... but they have been deployed by AID agencies using grant funding even though the sustainability of their use is near zero.

Mobile phone technology has produced a paradigm shift in communication. The deployment of cellphone technology has been very rapid, and a very good example of a low cost technology producing a very high value ... and marketed in ways that have made the service affordable to customers in a broad range of economic circumstances. Mobile phones have both data and analog capabilities, and this enables both text or data transmission and image capture and transmission. It is unclear how much of these technologies can be deployed immediately, but it is clear that rapid change is happening.

Internet ... cloud computing ... accessible data ... are all now possible in ways that were not available as recently as 2007. What is possible now is impressive, and we should prepare for even better data in the future. There are all sorts of technology initiatives that are progressing and perhaps suited to the TVM approach to data acquisition and management. These include:

- Social network web architecture

- Village bus data transfer
- Biometrics and identity
- Smart cards
- Phone cards
- Card to card payments
- Ubiquitous sensors
- Energy technology
- Solar technology
- Materials technology
- Battery technology
- RFID
- Bar code technology
- Search capabilities
- Audio
- Images
- Video

Reality check

There is however an important caveat. Powerful technology and analytical capability should not be used as a substitute for good data. There is no more place for sloppy concepts in a powerful analytical environment than in the much more power constrained situation of earlier times.

> Dr. John Gulland, FRS was a pioneer in mathematical modeling for fish population dynamics at FAO. The value of his work was diminished because the quality of the data being studied declined over time. The lesson is that there should be effort to have good data.