MEANINGFUL METRICS FOR A SMART SOCIETY

The Basic Concepts of True Value Metrics

CHAPTER 3
DATA TYPES
AND ATTRIBUTES

DISCUSSION DRAFT

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Chapter 3-1

Characteristics of TVM Data

TVM Starts With Data

Data centric everything

In a world where there are complex linkages there must be management information so that decisions can be made … and data about performance so that decision making can be revised to take advantage of opportunities for progress and to minimize the impact of unfavorable outcomes. The key is to make data drive every thing … and for the data to include not only money accounting elements but also elements that relate to operations and value that impacts society.

TVM is not a management system … it is only part of a management system. It is an important part … but only a part. TVM provides a way to do "scorekeeping" and to have "stats" so that performance can be improved. The data and metrics of TVM are independent and aim to be objective and useful. The goal is to help to have real progress and high performance … not merely a data construct that makes people feel good on top of bad progress and performance.

Data that gets used … scaling down

Data is only useful if it gets used, and in part this is going to be achieved by having data that is useful to people who "do things" rather than merely being of interest to the academic world and to those who only work at the policy level.

Many dataflows are designed to by aggregated and used to give top level indexes of performance … but these dataflows do not help to make good decisions at an operational level. TVM does not have a focus on scaling up and aggregation, but aims at having very good data at the lowest scale rather than at the biggest scale. In the TVM data model a small about of data will tell a lot about a small place … something that gets more and more difficult as the scale increases.

A different set of perspectives

TVM is is a paradigm shift for the metrics that are used in the decision making processes of society. The prevailing process uses metrics that are about an organization and its profit performance, and then the impact of these and other decisions on metrics like the national gross domestic product (GDP and the various measures of capital market performance. Very little in the prevailing system of metrics relate directly to society and quality of life and the the dynamics of value economics and value accountancy.

Nature of data

Representation of reality

Good data are a digital representation of a reality … with no meaning at all except as they relate to the reality.

TVM avoids advanced statistical method that seems to create a virtual reality where there is really no tangible reality at all. That is not to say that statistical method has no utility

… but merely that in the context of socio-economic data and analysis, other methods for understanding performance are likely to be much more reliable.

Data are used to store knowledge ... data are knowledge ... and data are used to communicate knowledge. Reality becomes data ... then with analysis, information ... and with human interaction, knowledge ... and with experience and reflection, wisdom.

Materiality … don't sweat the small stuff

The purpose of TVM data is to facilitate progress and make it possible better to manage resources. Having more and more data is not the goal ... rather it is to have more and more productivity and social value. In order for this to be achieved, the data must relate to matters that are material ... that can make a difference.

A surprising amount of activity is small stuff that does not have much impact … and individually not of great moment. This small stuff must not be allowed to clog the system and slow down or stop good decision making.

There are times when the small stuff adds up to something that is important. Sometimes it becomes possible for great progress to be made because some small item can be deployed over and over again … and in aggregate becomes very valuable.

Knowledge has the potential to be very important … small increments of knowledge have the power to release millions of people from their constraints … but where to start? The potential of knowledge to change people's lives is fairly obvious … but what is surprising is that something this obvious does not seem to be working very well!

Materiality … relevance of data

The data needed for analysis and decision making are those data that are relevant to the solution to the problem. An iterative approach to data is required. Simple data about everything is important to identify where the problem needing solution is to be found … and then more data are needed about these matters. For example if a problem seems to be related to water … then more data about water is needed whether it is about its availability or its quality or otherwise. If the problem is about water, data about housing, health and education is not relevant and need not be taken into consideration in connection with the analysis of the water problem.

The relational construct

The data about socio-economic performance may be organized using a normalized relational construct. TVM data are organized using the relational model. This approach makes it possible for a small amount of incremental data to be related to everything else and have useful value within the established analysis framework.

Cobb in 1978

When the relational model for database design was developed in 1978, there was a paradigm shift in the way accounting could be done. The relational model made it very much simpler to handle the aggregation of data and drill down ... and to be able to study the data from different perspectives.

Ubiquitous

Data are everywhere. The more we learn about life ... about almost anything ... we learn that there is a data component that makes life work. The brain is all about data ...

Mali … 1980s

I had a conversation with an old man in Mali ... a village elder ... when I was in his village during the Sahel famine of the 1980s. He knew a lot about the

history of rain in his village ... much more than was recorded in sophisticated data systems. It taught me that "If I do not know something ... it does not mean that it is not known".

In the broader context, I argue that very little is known by economists and planners about community ... but a lot is known about community by the people that live in the community. They have the data ... but not in a form that we find easy to use!

Data of many different types

In meaningful metrics, the data are a real representation of a reality. Some realities change slowly and so do the data ... some move rapidly and these data change rapidly. Both are important in the proper context. TVM uses data as efficiently as possible using a concept of organizing data that has its origins in classic business accounting where data are of several types.

Data may be characterized as either permanent data and transient data. Permanent data changes slowly, while transient data is changing all the time. For example the name of the town and its location are permanent data, while the current weather is changing all the time and is transient data. Transient data sometimes changes very rapidly ... for example data about economic transactions, while the results or impact changes more slowly.

Data need to be believable

Data need to be right. The analysis of data that have little relationship to reality has little value ... worse, the analysis may result in bad decision making. There is a need to ensure that dataflows have integrity and there is no replacement of valid information with fictional data. There is also the need to ascertain that data that are in the system are correct through a system of validation.

GIGO: Garbage In … Garbage Out

While it is good practice to have fully normalized data in a relational system to have the most efficient data processing ... it is sometimes desirable to have redundancy in the data and dataflows so that data may be verified in an independent manner. Data should not only be right, but be seen to be right!

Detailed data … no more tyranny of the average

The socio-economic system is complex … but with meaningful data about a specific place it is possible to identify critical constraints in this place and address them. It becomes possible to understand cause and effect, and to identify and build on specific possibilities of the community.

The difference between the performance of one place and another is substantial … and data that improves decisions about the allocation of resources and the application of effort will make a big difference. In any specific place some things are good and some are bad … nothing, or very little, is average.

Good Managers Use Specific Data

Good managers understand their operations … they know what works well and they know what is not working well. They achieve improved performance by replicating what works well and eliminating what does not work well. As a result of this, the average improves. They do not work on

the "average" … they work in one way on things that are good and in another way on things that are bad.

With meaningful metrics it becomes possible for managers and decision makers to facilitate more that is good and to sort out what it is that makes some things bad. Decision making based on this approach results in impact that is huge … but again not easy to quantify.

Beyond proxy measures of performance

Causality based on statistics is academically interesting … but not practical for operational decision making. In a specific place, there must be knowledge and understanding of specific cause and effects. Broad policy agendas do not translate efficiently into local action and impact without local specifics. The devil is in the detail … and only at local level is detail recognizable and issues solvable.

Good metrics improve decision making … and the impact from this will be huge, though difficult to predict and quantify. TVM true value metrics are meaningful about community priorities … not simplistic or statistical constructs around some simplistic proxy for performance.

World Bank … disbursement a key progress metric

The World Bank for years used the amount of project disbursement as a key measure of the performance of a project. A project that did not disburse was considered a bad project. The idea of how well the funds were used was a secondary matter. The World Bank is a huge institution that has compiled a massive amount of data, almost all of it with a "Top Down" perspective and of little utility for practical improvement of society using "Bottom Up" community level decision making and activity.

Chapter 3-2

Basic Dataflow

Dataflow Architecture is Important

Data acquisition

Design to collect data locally

The best way to collect data is to collect using a locally based system. This has many advantages including the short linkage between the reality, the data that are collected, and local decisions that may be made using the data. There can be a well motivated team engaged with this work, and local costs may be considerably less than would be possible using a team comprised of external experts.

The use of satellite imagery and remote sensing to replace local data collection is counterproductive because much of the value of the data is derived from the use of the data in the local setting … but these technologies may be used effectively to supplement locally acquired data.

Academic research is not the right model

There is a place for academic research … and a role for rigorous scientific and statistical method … but most decision making should be bast on fast low cost dataflows that are right enough to get the decisions right practically all the time. This is not what academic researchers are able to do … and in the main, this is not what their they are working to do!

Use data many times

The most cost effective data are data that are used in many different ways. There should ideally be one pool of data, and this one pool should be used in different ways for the specific analysis needed. Essentially analysis provides many different views of the data.

Use locally … simple analysis, practical use

Local data may need some simple analysis to be useful for local decision making … but this should be quick and easy. If there is progress … good … if there is little or none then what was wrong with the analysis and what should be tried now.

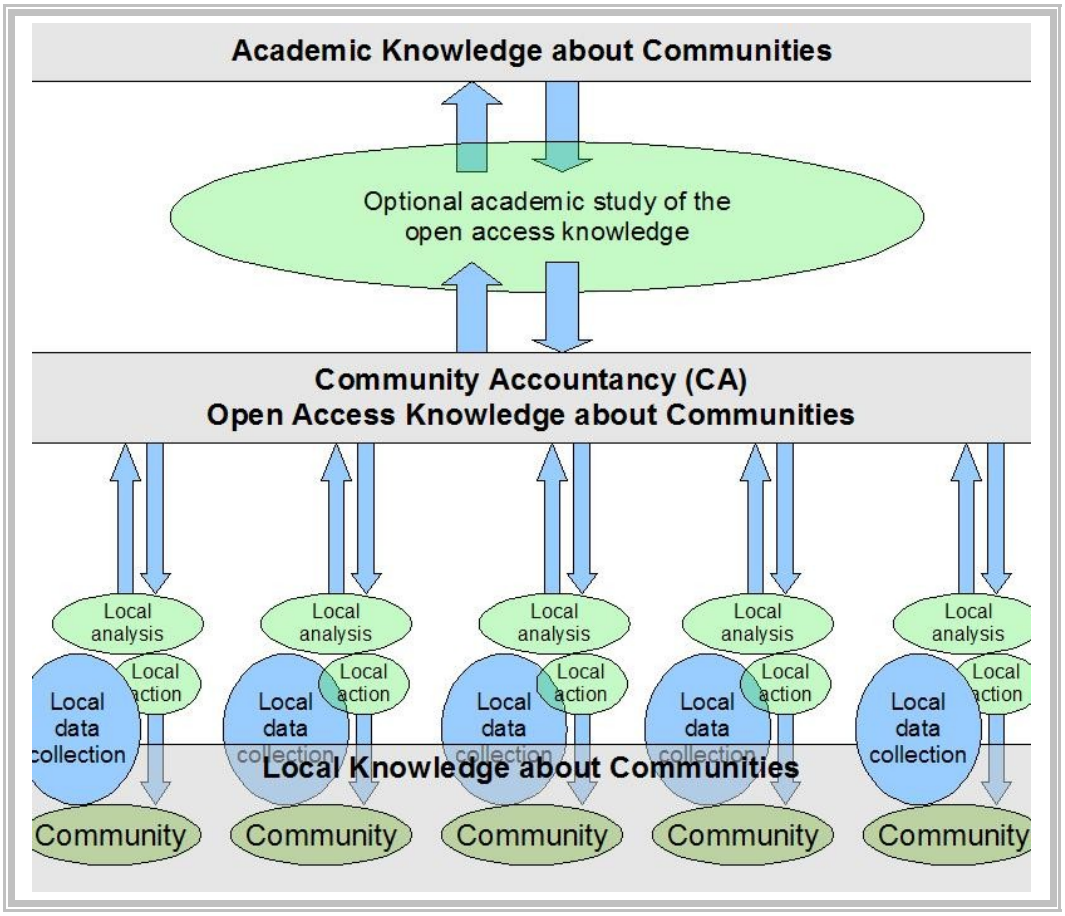
But in this local analysis and local decision making there is a "risk" evaluation that may not be fully understood or articulated. Poor people do not have the resources to afford a mistake … they cannot "write it off" and move on the way a rich corporate group might do. The children do not go to school, or worse, they die.

In the context of TVM, local data are first used to help with local operational decisions. These are decisions that have a big impact on the performance of a community and frequently are the lacking in data that are relevant and timely.

The most important use of data is the use of data to manage local operations and activities. This is where performance improvement has the most impact and where good

data may have achieve the most. With good local use of data, the cost of collecting data and the value of using data are within the same economic domain.

The following graphic is a simple representation of how data may be used to serve several different purposes effectively.



Local data collection ... local analysis ... local action is the cycle that improves performance most directly and most quickly.

Having the data also used at a "higher" level facilitates oversight and the sort of monitoring that can be used to identify the need for corrective action by the analysis of much larger sets of data. At a higher level there can be analysis that identifies "best practice" and issues that are impossible to identify with local analysis alone.

Local people collecting local information is a good way to achieve cost effective data collection. There is a need for adequate training and supervision, but that is true of any approach to data collection. The two advantages of local staff are: (1) modest remuneration requirements; and, (2) familiarity with the place and people.

Survey inaccuracy ... amazingly wrong!

Some recent work supervised by Dr. Jonathan Morduch of NYU showed that interview data was hopelessly inaccurate from a first visit survey ... and only reached reasonable correctness after several weeks and multiple visits.

No one data collection approach is likely to be universally optimum. So much depends on the training and experience of the people in the community, and the practical issues of access to information technology and communications infrastructure. A hybrid system

involving both manual forms and electronic systems will usually be the way forward. The cost effectiveness of writing in ink in a book should not be totally discounted!

Use same data for oversight and accountability

The same data that are useful to help make decisions at the local community level are also the data that may be used to do oversight. The data architecture allows for roll-up and making summary reports … and with summary reports it is possible to do oversight easily and accurately. Where needed the same data may be used to facilitate accountability. The data architecture used for TVM enables oversight and accountability without contributing to more and more data overload.

Then use data for academic study

Some academic study needs a large amount of data, and the TVM data architecture makes it possible for a very large database to be built that allows for very large data mining projects to be designed and set in motion.

> **Example from the malaria health sub-sector**
>
> Detailed spatial information is needed to control malaria in a community … and these data in a consolidated form are suited to oversight and accountability at a higher level. The same data are also ideal for the large scale data mining needed for the early detection of pesticide and drug resistance.

Scientific research may result in a better understanding of the underlying science and critical issues that will never be seen in the smaller local datasets.

Keeping data costs low

The multiple use of data is one element to making data cost effective and valuable. The basic data architecture used by TVM maximizes use of data. This has the secondary effect of making the data more reliable, because data that are used are always more reliable than data that merely sit and do nothing!

Another element is to do data collection in the community for the community by the community. This is usually lower cost than having data collection experts from outside the community.

Technology may be a way to reduce costs … but a problem with technology is that it often serves to make something technology intensive rather than labor intensive and in the process transfer low labor costs to become high technology costs. Good cost analysis will show this problem … but when there is no costing, it is easy for this matter to be hidden from analysis!

Ubiquitous mobile technology infrastructure

Though the power and possibilities for the application of information technology have improved by a millionfold in the course of the last fifty years, but it has not resulted in better data or decision making to benefit society as a whole. The use of data to achieve broad based socio-economic progress and high performance has been very limited.

Anyone and everyone can use TVM … contributing to dataflow using a mobile phone or Internet webpage forms. Individuals may be contributors to the dataflow … as well as organizations.

The dataflow that results makes it possible to have independent oversight of socio-economic activity and in turn the organizations engaged in decision making about the allocation of resources and choice of activities in the community and the global economy.

All the stakeholders in society are able to make use of the data and analysis so that decision makers have the data that will help them … and there can be oversight and accountability about the progress and performance by all the socio-economic actors.

Data transmission

Modern technology makes it possible for data to move around the world instantly ... but why? The goal should be to use data usefully more than merely to have data. Although long distance and global data transmission is very low cost ... compared to pre-electronic times ... it is not costless, and it is unproductive.

Data that are useful for improving performance at the community level should be easily accessible for decision making at this level. These data do not need to travel far in order to be of material value locally. The same data, however, can be transmitted to a consolidated database for scientific analysis if that is required.

The Internet makes it possible for data to move from one part of the globe to another instantly. The only requirement is Internet access ... broadband Internet access. Increasingly broadband Internet access is widely available, though in many poorer countries the cost of access is relatively high. Data may be transmitted using an FTP (File Transfer Protocol), using an attachment to an e-mail or direct upload to a web-based application.

Mobile cell-phone technology has now become very widespread and is now capable of some data transfer more conveniently than using the Internet. Cell-phone coverage is now reaching most communities around the world, including quite poor and remote places.

Some special data design is needed for transmission efficiency, but transmission efficiency can be good where there is application of the relational model for database design.

Data storage … and efficient access to use everywhere

Data are essential to transparency and accountability but data that are needed are rarely easily accessible. Good data storage facilitates access. The details of the storage architecture will change from time to time ... but the general theme is that data should be accessible easily for those who need the data to make good decisions. There are multiple levels:

1. **Data in the hands of a data collection person**
   These data are needed so that the work of data collection can be as efficient as possible ... including some immediate feedback about changes that might be locally important.
2. **Data at the community level**
   These data may be analyzed very quickly to provide the information needed at the local level to determine what are the issues and how they might best be addressed.
3. **Data at the national oversight level**
   These data are a component of the data needed for good governance and oversight.
4. **Data for national level research**
   These data are a part of a research process that has the potential to help with both learning and teaching in the country
5. **Data for global research**
   These data are a part of a research process that has the potential to advance learning on a global basis. Modern computational technology such as available at

> the US National Center for Supercomputing Applications (NCSA) makes it possible to process very large datasets and learn from these data.

Data are needed for the effective management of performance ... but it is not at all clear that the essential data are collected ... and to the extent that they exist, they are not easily accessible.

Because data are important for the administration of society, it is normal for there to be laws and regulations that give guidance about how data must be stored and be accessible to interested parties. In general these laws and regulations do not help very much with the issue of transparency and accountability as a part of day to day ordinary life. The issue of socio-economic performance and the impact on society is not part of the data landscape.

The corporate organization is increasingly aware that data storage is a cost in the best of times, and may be a catastrophic cost if the law and regulations are called into effect for access to these data.

Data storage has moved way beyond just paper ... everything can be digital ... everything can be organized so that there may be easy analysis and the data be valuable ... especially for society as a whole.

The cost effectiveness of technology is only going to be fully realized if the data architecture is sound and logical. This is the core of what TVM can do.

Chapter 3-3

Easy Data

Data Acquisition is Expensive

Use what is available!

The fact is that there is a huge stock of data … much of which never gets used. Some is compiled at great expense, and then used just once and forgotten about. Consultants have been paid enormous amounts of money to study a variety of things … in practically every case the work includes compiling data, doing analysis and drawing some conclusions. Once the study is done, the data exist, but do not get used again. The system is high cost and inefficient. These data can have value in a system that seeks to understand community state, progress and performance at least cost.

Easy data are everywhere

Some data are easy to acquire ... some very difficult. To the extent possible, easy data should be used as much as possible. These data may sometimes be obtained very quickly. The key is not to ask for specific information in a specific form, but to ask about what data are available that broadly relate to the subject at hand and use these data to the maximum extent possible. In many cases these data are easily available.

Some easy data have the added advantage of providing some history from past periods that cannot be obtained in a data acquisition program that is only collecting current data.

Data repositories and documentation centers

A surprising amount of data exists … but it is only going to get found when there is some pro-active search. Much older historic data are in paper documents … and while not immediately usable in electronic media, the data may be transcribed if it seems to be of some value.

Of course care should be taken in using data … whether new data or old historic data, that the data represents what it purports to relate to! Much data has been "fabricated" over the years and served to satisfy some dataflow conditionality without in fact representing any reality at all.

Some data … probably not very precise!

In my experience, I know of a hospital in Africa that reported completely fictional data about its patients for years. The hospital was chronically short of doctors and nurses and had no admin staff … and was also short of money and medical supplies. It had to report extensive and intrusive statistics in order to have even a limited supply of drugs from the government. The forms were filled with numbers every month based on pure guesswork not based on any data collection process! Good decision … but does not make for great data. We need to be careful drawing important conclusions from unverified statistics!

Walking around … observation and perception

A large amount of data may be obtained simply by "walking around" … but converting this into a useful record is not particularly easy. Increasingly this is being done using photographic images, but too often there is inadequate labeling of the image. The time and the place are critical information … together with some brief narrative.

Training in "observation and perception" is helpful … too many people do not see what there is to be seen. Hardly anything of what people see gets into any system of metrics about the progress and performance of society. This has to change!

Not more and more date … more information.

The goal is not to get more and more data … but to get more and more understanding of the community and the socio-economic state, progress and performance.

Some duplicate data is an advantage. When the same set of facts is reported using two separate sets of data, there is a good probability that the data are accurate. If there are three separate sets of data also showing the same set of facts, then it is very likely that the data are accurate. More sets of data after this, does not add anything except cost.

Data about other things adds to understanding. If one set of data are about health, another set of data about education would be interesting … and any other sector that seems to be of importance in the community, especially the production sectors.

Advanced common sense

The key goal of data acquisition is to have data that are useful and help improve performance. The goal of TVM is not to have data suited to research studies, but to have data that are useful for decision making and measuring performance.

Example of data acquisition for fishing fleet

A group of experienced scientists were asked to collect data about the structure of the fishing fleet. They designed a survey and statistical method to make their inquiries and did a perfectly random set of interviews three times a week for six months. At the end of this time they had nearly nothing of value.

I was faced with the problem of time and money used and no useful data. I am an accountant that does not particularly like statistical data. Every fishing boat has a license. To get a license the fishing boat must be registered ... and to get registered a form has to be filled in, and is filed somewhere! I found the filing cabinets and now had details of every fishing boat ever registered ... date of registration, size, type of construction, date of construction, engine make and horsepower, fishing gear type, refrigeration equipment or not, etc., etc.. After a day of data entry typing there was a respectable database. After a few days of checking at the fishing port we were able to verify much of the data in the database ... and now had complete and good data about the fishing fleet.

This cost effective data collection was obtained by building on data that was already available ... but unused because it was in another department!

Sometimes, the understanding of data may be enhanced by statistical study ... but good techniques of data collection, accounting and analysis are usually sufficient to get good management information for decision making. The key is to fully understand what data are important and what issues have a material impact on performance.

Chapter 3-4

Some Data Distinctions

Transient and Permanent Data

Treat transient and permanent data differently. Some facts change very quickly … some facts change very slowly, if at all. Building a complete set of metrics is done best and at least cost when the difference between transient data and permanent data is taken into consideration.

> **Permanent and current files in the audit context**
> In the pre-computer days of audit there was a "permanent file" for each client which carried forward from year to year and a "current file" for this year's audit. All the data that changed slowly was accessible in the permanent file, and the data that changed all the time was handled for audit in the current file.

Permanent data

Much of the balance sheet is permanent data

Much data about community changes quite slowly and should be handled as permanent data. Permanent data should be compiled once, and then over time the accuracy of these data should be checked and the data refined. Permanent data should be correct, and as detailed as it needs to be. To get permanent data that is correct and detailed is not very costly when this iterative improvement approach is used.

> **Incorrect permanent data**
> People who do not understand the difference between permanent and transient data tend to start from scratch every time they want data … and they always end up working with first generation data that are notoriously error prone.

The balance sheet has many elements that are permanent in character. Fixed assets are one category of asset that are near permanent … changing relatively slowly over time. In contrast stock (inventory) changes quickly, essentially every day all the time.

Much of the data used to record the "state" of the community or other entity changes quite slowly … some of the data does not change at all over time. These data are known as permanent data. TVM aims to have the permanent data about a community as accurate as possible, as useful as possible and easy to access.

The balance sheet of a community or other entity is a comparatively easy set of data to use for analysis and management. The data is fixed in time … and the period over which comparative change is done may be selected at will.

It is relatively easy to get good permanent data. By getting high quality in the permanent data, everything becomes very much easier and the information rapidly gains credibility.

With high quality permanent data it becomes far easier to understand and to put the transaction data into a proper context.

Transaction Data

Change is the aggregation of transaction data

Transaction data is changing all the time … there are a lot of transaction data … millions or billions of transactions within accounting systems everywhere … and socio-economic transactions in society at large. Transient data changes rapidly. In business accounting, all of the profit and loss accounts change quickly … every day all the time … and as these accounts change the stock (inventory) accounts changes quickly as well.

In accountancy, all transaction data are recorded and organized according to account classifications. Review of every every transaction is impossible … the ultimate in data overload … but using a periodic summary of transactions organized by account classification and an impossible overload becomes manageable.

The frequency of the periodic summary is an important determinant of effectiveness. Too frequent and there is data overload … too infrequent and important changes in data may be missed. In a corporate business setting, one solution to this matter is to have monthly management financial accounts, and key operating data that reflect the specific process and its characteristics. Production and inventory records are almost real time review for production purposes … with the financial summary review just once a month. External reporting is perhaps quarterly and full financial reporting once a year.

In money accounting the profit and loss account reflect a lot of transient data … the balance sheet is slower moving with more permanent data. Part of the genius of accountancy is that the change in the balance sheet is the net of ALL the transactions of the profit and loss accounts. This means that in effect performance can be measured simply by using the balance sheet.

Community reporting can have a similar structure. There can be periodic value reporting for the community as a whole using the “state” of the community or balance sheet of the community, and change in state from one time to another to be progress of the community.

Separately there can be analysis of activities in the community that are have impact on the community.

In money accounting all the financial transactions of the organization are recorded in a systematic way with enough coding to facilitate meaningful analysis. In a big organization there may be millions of individual transactions. Modern computers and information technology facilitates the handling of large amounts of data, but the basic architecture of accountancy also makes it possible for a large number of transactions to be organized usefully even without the use of computers.

In accountancy, the operating statement reflects the aggregation of transaction data, and the balance sheet an aggregation of items that change as a result of the transactions. This is reflected in the accounting constructs of balance sheet and operating statement, with the balance sheet representing the more permanent data and the operating statement the more transient data.

In practical terms this translates into an ability to verify balance sheet reports more easily than one can verify transient operating statement transactions. This is a vital matter, because fraud and corruption can easily take place within the activities of an organization and the funding of these activities, but it can easily be detected if there is meaningful oversight of the results and the balance sheet that puts result on the record. Data

collection costs are optimized when the data are collected using techniques that are appropriate to the type of data.

Activity data is more difficult to acquire than permanent data. There is more of it ... but not all of it is needed. Activity data are needed about issues that are important in the community and the subject of current analysis and action.

In accounting all economic transactions are recorded ... in TVM all transactions that are of relevance to the measurement and management of performance need to be recorded. Because of the relational architecture of the data, it is simple to record data in a way that is simple and very precise. Where the data are being collected for use in a relational analytical environment, the permanent data are all accessible to any transaction related to this permanent data.

Executive data … summary data

Helps the understanding of large amounts of data

Executive data are summaries of transactions that facilitate analysis and decision making. These data are used to "slow down" the flow of data to decision makers so that "they have time to think!" They are also easier to store and easier to access when needed. Even with very fast computers it takes time to "query" the transaction data warehouse in order to get a response … and frequently the response needed may be anticipated.

In good accounting systems and in TVM there are data that flow all the time with absolutely nothing done in response to the data. However, there is action and decision making when there are changes in the data that indicate that something is "going wrong" or something has changed. Good systems alert decision makers to changes very quickly … in most of society there are little or no data to alert decision makers until it is too late!

One form of executive summary data are periodic statements of progress and performance for a reporting entity. This summarization consolidates all the similar transactions for a period into a single datapoint and makes review of these data quick and easy.

Summary data are produced routinely in accounting systems using "accounts". Transaction data are posted to accounts, and the accounts are periodically totaled to prepare periodic financial statements. Many transactions are able to be summarized into a relatively few summary numbers that have meaning and are useful for analysis and the tracking of performance.

Chapter 3-5

Qualitative Information

More of This Than Anything Else

And not much of great utility

These data not easy to use

In the last decade there has been an explosive growth in the quantity of information … most of it qualitative information, and almost none organized for easy analysis. The pace of increase in qualitative data has accelerated in the last five years as more and more still images and video join the simple text explosion.

Qualitative information is important … but it is not easy to manage and use. Rather qualitative information works well to clog the system and create information overload.

The academic community with the support of the ICT industry is researching to find ways to take advantage of this huge stock of information … and to profit from it.

There has been modest progress in getting more qualitative data organized, but these initiatives are puny relative to the disorganized text, image and video information that is now swirling around the society.

One of the keys to making effective use of qualitative information is to get it "organized" in an appropriate way. A starting point is for individual data elements to be associated with key attributes like the time, place and source of the information.

TVM is not journalism

Journalists are taught that they need to tell stories … create human interest … make believable with numbers … and so on. TVM is not journalism, but is a simple data system that aims to have data that are right, are useful and are reliable. In TVM, boring is OK … stories and numbers that result in misinformation are not!

Qualitative data often includes some numbers, but these are rarely reliable especially if the text had its origin as journalism where numbers are often added for effect without doing much validation of the veracity of the number.

Qualitative data do not have great utility and contribute to data overload. The bad news is that there are more and more data communicating less and less. The good news is that there is technology that is able to handle data at a lower and lower cost.

Getting qualitative data organized

This basic organization is needed

Qualitative data must be organized in some way … such as pulling similar sets of data together to make it possible to sense what the complete profile of something looks like. The first cut at organization is to pull together data that relate to a specific place … and

within these data organize the data around subjects … and then organize into time sequence.

Where best to coordinate?

High level planners and evaluation experts fall back on lack of coordination as the reason initiative fail to achieve their goals … especially around the World Bank and United Nations, and the official relief and development assistance (ORDA) community. This leads to the conclusion and recommendation that there should be a coordination mechanism … and soon there is another overhead organization doing "coordination". TVM has a different conclusion … that there should be more specific expertise at the "top" with little "coordination" and heavy coordination at the community level where different sectors, organizations and activities have all got to work together in order to get anything done.

Qualitative data organized in time sequence, within sector, within community is a good foundation for coordination … and the start of analysis that will help to coordinate priority initiatives in the community. Data organized in this manner has the potential to be able guide the focus of effort and resource allocation so what needs to be done can get done.

Data have more utility when related to time and place

Any sort of data has more utility when related to time and place. Stories without time and place are potentially dangerous … potential misinformation that encourages wrong behavior. It is widely practiced in fund raising for not-for-profit organizations and discredits the sector.

Descriptive data that related so something at a specific place and time is a starting point for the analysis of change. Another description at the same place at a different time allows for comparison and something of interest may be learned about any change that has taken place … whether or not there is progress or not … whether or not there has been any change!

Getting utility from qualitative information

When there is numerical information it is possible to get the data easily organized and summarized … but it is also possible to have qualitative information that is also very useful without having much in a numerical form

Cholera in Haiti

When the news media reported the presence of a deadly cholera outbreak in Haiti … it was interesting bad news, and not immediately apparent that it had management utility. The news becomes more useful when it was related to the cholera situation in the past. A few months before there was no cholera and no news. There was a change for the worse … and there must be a reason.

We know that the sanitation situation in Haiti has been totally unacceptable for a long time and was likely to result in a bad health impact … much more should have been done to avoid cholera getting into the transitional camps … and we now know that whatever was done was insufficient. We do not know explicitly who is responsible … but we do know enough to be able to stir-up the parties who should have been responsible.

The purpose of information is to get better decisions made … not merely to have intellectual and academically rigorous data that has huge cost but little utility.

Chapter 3-6

Quantitative Information

Numbers Help in Many Ways

Metrics about key items

Many different units of measure

Quantity metrics help to identify what is important and what is not. Numbers and the associated "unit of measure" make it very clear what is the scale of what is being reported. The media routinely included "numbers" in their reports, but the numbers rarely are presented in the clearest manner, but in ways that "support" the thesis of the article. TVM has a very different approach. Numbers are used to make the facts as clear as possible so that it is possible to ascertain with confidence how good decision making is and what results are being achieved.

How many? How big?

About people?

One of the most important questions is to do with people. How many people are there? With this number it is possible to calculate the "per capita" of any money or value metric, and with this have a way to do simple comparison with other places.

There are many measures that relate to people. Some are to do with quality of life … some are to do with the health of people … some the education and skill status.

Metrics about place?

Another important question is how big a place. A big number of people and a small place has a different dynamic than a small number of people and a big place.

What time? How long in time?

Whenever "state" is referred to, there is a need to know "At what time?". State may change over time, so information about state without knowing what time is insufficient.

Progress is about change over time. The pace of progress is dependent on how long in time between one measurement of state and the next. Accordingly a balance sheet should always be associated with a date time stamp.

Data about an activity my be associated with the state in which case a date time stamp is needed or it may be associated with work being done in which case the time duration information is needed.

Lack of clarity about time is one of the ways in which information is distorted. Numbers are made to appear much bigger than they are by reporting numbers that refer to a very long period of time … and made to appear small by associating them with a short time period.

Far too often, important news stories are supported by images that are associated with an undisclosed time … perhaps giving an incorrect impression.

Where? How far in distance?

Data that are associated with a specific place are more valuable than data that are not. Different places have different characteristics … averages created from small samples and associated with big areas can rarely can be associated with anything real. A small amount of data about a specific place may be very informative.

"How far" is a useful fact in many situations. Knowing where is useful … but so also is knowing where in relation to some other place.

Indexes of how good or bad?

Numbers are useful to quantify many different items and facilitate comparison and how one situation relates to another.

Indexes of various sorts may be used. In TVM, a simple index may be used to identify progress. Simple indexes should be used with care. They may be used, for example, in the context of multiple baseline time series analysis of community performance.

Standard value and quality of life

The quantification of the elements that go to making up the quality of life is a critical factor in true value metrics meaning anything. This is not an easy process but it can be done.

TVM uses a system of standard values rather like the system of standard costs that are used in cost accounting. Everything that goes into making up quality of life is assigned a standard value … not a money value but an index that has a basis other than money. Something has a value of 1000 … everything else is valued relative to this element.

Everything is relative. The same element may be quantified differently in different places because of, for example, cultural differences. The same element may have a different quantification because of perceptions of value that change with age … or between ethnic groups, etc.

Business and economic metrics

Key item control

Most business activities have a quantity element as well as the money and financial measures. Keeping records about key items helps to manage large and complex organizations.

Performance of the economy

There are hundreds if not thousands of different quantitative economic indicators. These indicators have been incorporated into all sorts of economic models that are used for the analysis of the performance of the economy and the impact this performance will have on various money measures like corporate profit performance, stock market prices and GDP growth.

These various quantitative measures should also be associated with the value dimension of socio-economic performance.

Chapter 3-7

Money
Numbers

What Does Money Measure Anyway?
Money numbers are ubiquitous
Almost all the numbers used in business and economics have money as the unit of measure. Money is the most common measure used throughout business to measure performance … the money expended, the money that is received, and then the profit. Most economic measures are expressed in money terms … and indexes are derivatives of money measures.

Money … a currency as a unit of measure
Cost, price and profit are very important numbers in money accounting related to all economic activity. Though modern society is founded on economic activity, there is a surprising lack of information about cost and value though there are massive datasets about prices. ... that is what a buyer pays for a product or services, and what prices stocks and other financial interests are trading at, what prices commodities are trading at, etc. There is by contrast almost no data about costs ... and even less organized data about value.

Corporate accountancy is only about money cost and money price. TVM uses cost, price and value. Cost, price and value are the three key numbers that describe economic activity. The relationship between these numbers determines the performance of almost any economic activity. All of these measures are important ... any one missing and the understanding of the dynamic of societal progress is compromised.

What is money?
Money as a metric used to be easy … its simple definition was that it was a medium of exchange and a store of value. The size of money was fixed relative to a given amount of gold. Gold was fixed in price relative to money and money was fixed relative to gold, or fixed relative to another system of money that was fixed relative to gold.

But all the simplicity disappears when the size of money is driven by market forces and economic decision makers rather than being related to a given amount of gold. With money no longer tied to gold but reflecting market forces and economic decisions the use of money as a metric becomes problematic.

What is wealth?
Wealth is a concept of the amount of economic good that there is. Wealth may be owned by an individual or family, or it may exist in the society at large. Typically wealth is measured in money terms.

Many global currencies
In the first half of the 20th century the UK Pound Sterling and the US Dollar were the dominant world currencies. In the post WWII era the UK Pound declined in importance and the US dollar became the dominant world currency. As the global economy has

grown, many other currencies have grown in importance, and come to serve different needs.

For example, the Swiss Franc has become a safe haven currency, and the Japanese Yen came to represent the strength of the emerging Asian economies … and then years later the Chinese Yuan became another strong Asian currency reflecting the success of the huge emerging Chinese economy. Many of the European currencies were merged into a single European currency … giving the Euro currency grand scale, but limiting the room for monetary maneuver by the individual countries within the Euro Zone.

Money used for business metrics

Cost

Important that there is good understanding of what is cost, and what is price. From the view of the buyer, then the price paid is the cost. If it is the view of the seller, then the price paid is the price. Money cost is what gets paid for someone to have a good or service. Money cost is also the use of resources to create a good or service ... the aggregation of all the elements of cost that go into creating something. Elements of cost are things like: labor; materials; operating expenses, admin and overhead expenses, depreciation and financial costs.

There are very little easily accessible data about costs. In most good organizations, cost accounting is detailed ... and often very informative ... but also maybe overwhelming. Standard costs and variance analysis are methods that help clarify cost data, identify variations that need explanation and measure cost efficiency. Cost has multiple components, and one of the most useful data points for cost is the one that eliminates all the profit elements from the cost value chain. The socio-economic success of the last two centuries has been reduction in cost.

Price and revenue

Price is what a buyer pays for some good or service. It is what the customer pays at the supermarket or drug store. Price is what is being paid for the item ... price is the money received when an item is sold. For a buyer, the price is a cost ... something of a conundrum that confuses analysis!

Understanding price ought to be simple ... but is not. The price is usually framed in a way that makes comparison between different products as difficult as possible. This is no accident ... it is designed to confuse the customer and mis-inform as much as possible. Making comparison difficult is a standard practice in marketing.

There are also prices all the way along the value or distribution chain from factory gate to final retail sale. This chain sometimes involves changes in ownership, in which case there are prices that are reflected on invoices ... but the distribution chain may be under single ownership in which case there is no inter-organization price, merely a transfer price as the items moves along the distribution chain.

Price is also associated with the problem of affordability. People who need something may be poor and not have enough money to pay the price that the supplier can demand. This is a key issue in public policy for health, education and a number of other essential services needed by a progressing society such as water and sanitation.

And price may be value ... but usually is not. The price is merely what an item is traded at ... and may or may not have anything to do with value. Many factors influence price ... and where price is determined by market forces, there are many factor that influence the behavior of prices in a market.

Profit

Profit is the top metric of corporate performance … almost nothing else matters. In a simpler time, this was a reasonable situation, but in an era where corporate organizations are multinational and in many cases way larger than some national economies, the simple pursuit of profit creates many undesirable unintended consequences.

At its simplest, profit is the derivative of costs and revenues … reduce costs or increase revenues and profit increases. But what about tomorrow's profit … and what about social impact? These matters are not part of the profit metric, and not given much weight in the performance analysis of the company.

Over the past two decades there has been a powerful outsourcing movement … where costly activities in one country and moved to be done in another country where the costs are lower. The corporate impact is increased profit, and a related increase in stock price. The community impact, however, is an undesirable reduction in employment in the job losing community in one country that is matched by a desirable increase in employment in the job gaining country. Profit is the only metric and is the primary incentive that drives decision making … with community impacts being completely ignored.

Money used for economic metrics

Stock market price levels

The world of business news thrives on movements of the various stock market price indexes. Theses indexes are based on the stock price movements of relatively few stocks, yet have a great amount of weight in determining sentiment about the performance of society that is really unjustified. In the first place business profit performance is only about money performance ignoring social value and the relationship between profit and stock price may vary considerable because of perception about the state of the economy and the potential performance of the business over time.

Nothing in the stock market indexes relates closely to the quality of life of society. These indexes ignore the matter of social value almost totally.

Gross Domestic Product (GDP)

Gross Domestic Product (GDP) is another deeply flawed economic measure. It does not really reflect economic “product” but uses various proxies for economic activity and product that, over time, have distorted GDP in dangerous ways. In a closed “prosumer” economy … that is where production and consumption are essentially one and the same … it is reasonable to think of consumption as being a “product”. This is not a valid assumption where there are substantial trade flows and consumption and production have different behaviors over time. There are also problems with GDP in connection with many service sector activities including health and education. In the case of healthcare, the “product” is good health … which has little correlation with the amount of money that gets spent on healthcare.

Modern money … changing in size all the time

No longer a good standard for measurement

Money is a poor way to measure anything because it is changing all the time. This is bad for measurement, though it does have advantages for policy makers and those that ought to be held accountable for the socio-economic performance of society.

In simple terms the buying power of a US dollar of 2010 is something like 7 to 10 cents of a 1960 US dollar … and this may be a rather nice treatment of the 2010 US dollar. In terms of gold … gold, which used to be 36 US dollars an ounce in the gold standard era, now has a market price of around US$ 1,200.

The "size" or "value" of money is changing all the time. A measure should not change over time … but money does … it changes a lot.

> I bought a house in New Jersey USA for $60,000 in 1976 … the same house sold for some $880,000 in 2006, 30 years later. This was not because the house had changed very much, but money and its buying power had changed a lot!

Inflation

Inflation is often measured using various proxy measures like the Consumer Price Index (CPI) … and it is interesting that the CPI has not reflected much US inflation over the 20 year period 1990 to 2010. Why not? … and the simple answer is that many products were outsourced to low cost manufacturing locations so that money prices could stay the same and money profits go up. Meanwhile everything that was a US based production or service activity reflected quite substantial cost push inflation together with an associated pressure on profits.

Modern economic commentary does not differentiate rigorously between the various component of "inflation" … the price changes that are a result of "cost push" and the changes that are the result of "demand pull".

Inflation is also affected by productivity … with improved productivity making it possible for prices to drop, and high pricing of inputs to goods and services making it necessary to have high prices.

Inflation is a complex outcome … but in itself not important. It is an almost meaningless money measure … not enough related to anything that is to do with value and the quality of life.

Money exchange rates

Money exchange rates are one of the major sources of global economic distortion. Basic economics of supply and demand make it possible to change exchange rates simply by the "printing money" and thereby debasing the currency.

Chapter 3-8

Value
Numbers

The Idea of Value

The idea of value is not new. It is a long time since the non-money dimension of quality of life has been recognized as important.

> To its credit, the United Nations … specifically the United Nations Development Programme (UNDP) … set up a system of reporting in the early 1990s at the national level that used measures about human capital. This was in response to the pure money economic statistics that were the main focus of the World Bank, the IMF and others. The UNDP's annual Human Development Report (HDR) set out to measure and report on many metrics that had impact on quality of life.
>
> The HDR is a useful set of benchmark data … but does not integrate these data into a complete framework so that state, progress and performance many be better understood.

Value is subjective

And value is important

Value is subjective ... and very difficult to quantify. Value is arguably far more important than money cost and money price. Value is subjective ... and very difficult to quantify ... but that does not mean that value should be ignored by a socio-economic system of "scorekeeping". Value is, after all, more than anything else, what determines quality of life.

The idea of actual value is difficult to include in a system of metrics because "value" is perceived so very differently by almost every individual. Value is personal in the extreme!

However, to ignore value as an critical independent measure and simply to use the market and money price as a proxy is not an adequate solution.

Value is subjective ... and therefore difficult to quantify. The challenge with value accounting is how to have numerical values that are an integral part of the system.

Value is personal ... and important

The idea of value is difficult to include in a system of metrics because "value" is perceived so very differently by almost every individual. Value is personal in the extreme! Value is subjective ... and very difficult to quantify ... but that does not mean that value should be ignored by a socio-economic system of "scorekeeping". Value is, after all, more than anything else, what determines quality of life.

It is insufficient to ignore value as an independent measure and simply to use the market and money price as a proxy

All sorts of things have value … this we know. The question is how to get them into a form of accounting without the process becoming too complex.

TVM has value as its core. Value is as central in TVM as profit is in business reporting systems. The value of a community ... or society ... is the key measure in TVM and a core determinant of how society delivers on the goal of happiness and quality of life.

Quality of life is an important matter … it is more important than simply wealth which is measured in money terms. The quantification of something like the quality of life has to take into consideration personal likes and dislikes … but for all the difficulty, it must still be done. In the US Constitution there is recognition that something deserving of protections are life, liberty and the pursuit of happiness. This is what quality of life is all about. Beauty … dreams … possibilities … freedom … opportunity … security, etc. are all components of quality of life! These value elements are arguably more important than money cost and money price that are easy to quantify!

Price is not value

Price is not value. They are different concepts. Value is often expressed in terms similar to a price ... but they have a different origin. Value has to do with perception ... what someone is willing to pay for something in order to be gratified. Because the money numbers associated with value are rarely articulated, and not the subject of conversation and news reports, there is a weak set of value information. It is critical that this is changed. Associating a money number to values is regarded as a difficult ... even impossible ... task. However, this is very important if society is to have metrics that reflect what is the most important in society.

Value and culture

Value is not the same in all cultures and locations! Value is not the same in all cultures and locations! Culture plays a big role in how value is perceived. Modern materialism has tended to equate more and more or bigger and bigger with more value ... but that is not the only way value may be perceived. Different cultures in different places may put different values on the same things ... and this should be respected and value optimized based on what is most appreciated in the community.

Culture plays a big role in how value is perceived. Modern materialism has tended to equate more and more or bigger and bigger with more value ... but that is not the only way value may be perceived. Different cultures in different places may put different values on the same things ... and this should be respected and value optimized based on what is most appreciated in the community.

Value numbers mainly missing

Value is everywhere … but rarely measured

All sorts of things have value … this we know. The question is how to get them into a form of accounting without the process becoming too complex.

TVM has value at its core. Value is as central in TVM as profit is for profit corporate reporting systems. The value of a community ... or society ... is the key measure in TVM and a core determinant of how society delivers on the goal of happiness and quality of life.

Money measures are everywhere, but value measures are mainly missing. When the scorekeeping is all about money, then the game is played to achieve the most of money, with value getting sidelined.

Money is NOT the unit of measure for value

Money numbers are widely used as a proxy for value. But money is NOT the unit of measure for value, though money may be used as a rather inefficient proxy for value.

Using a 1:1 relationship between the Value Unit and the Money Unit is a crude first step … but better is needed. Money and value are two entirely different units of measure and Have very different behaviors.

Price is not value. They are different concepts. Price may be used as a crude first approximation to value. Value is often expressed in terms similar to a price ... but they have a different origin. Value has to do with perception ... what someone is willing to pay for something in order to be gratified. Because the money numbers associated with value are rarely articulated, and not the subject of conversation and news reports, there is a weak set of value information. It is critical that this is changed. Associating a money number to values is regarded as a difficult ... even impossible ... task. However, this is very important if society is to have metrics that reflect what is the most important in society.

Standard Value

Using standard value to quantify value

The TVM system uses the concept of "standard value" to provide a basis for doing the accounting for value. The standard value serves as a fixed benchmark and changes to these benchmarks becomes a way for changes and differences in various societies to be a part of the record.

Standard value for community state

The value balance sheet of the community includes a quantification of quality of life. To make this practical and useful, TVM uses standard values for this. The value of a good life is not the cost of a good life … though sometimes price and value may have similar quantification.

> The value dynamic around health is complex. Good health may have a very big value, even though it is natural rather than being the result of expensive healthcare interventions. In another situation a sick person may have poor health, even though there have been expensive healthcare interventions. In another situation a poor person may have poor health simply because they cannot afford a relatively low cost health intervention.

TVM considers good health as the desirable norm and in the quality of life value balance sheet as an asset … and a lack of goo health as a diminution of the normal value and expressed in the balance sheet at a liability.

Consider the case of education and economic opportunity:

> For example, the "value" of a healthy well educated 25 year old with job opportunities in the United States is very different from the "value" of an unhealthy uneducated 25 year old with no job opportunities in Niger. There is socio-economic progress … a "value" increase … when more 25 year olds in Niger are healthy and educated and have better job opportunities.

The norm is for a person to have some education and for a person to have some economic opportunity … and this norm is in the quality of life balance sheet as an asset. Where a person has exception education and opportunity the asset value is increased … and where a person has less education and less economic opportunity, this is recorded as a liability.

Every element of quality of life is treated in a similar manner … the norm is considered the asset, and the difference from the norm is treated as an incremental asset or as a liability.

Putting a number on value is difficult ... but it does have some utility. As a matter of convenience, the number is also a number for money. Because there are no capital markets that trade in "value" there is no way for value to be monetized.

Elements in standard value

For the individual there are elements of value and quality of life … just as there are elements of cost. The primary elements of value are:

1. Family
2. Friends and community
3. Health
4. Education … skills
5. Wealth
6. Career Opportunity
7. Age
8. Gender

These value elements are part of the framework of value that is used for individuals and for community

Elements of value are similar to elements of cost. Standard values reflect the perception of value that people have. From this it becomes possible to have standard value profiles from an individual that may be aggregated for the community.

From this it becomes possible to accumulate transaction data and do analysis that reflect the consumption and creation of these values.

The difficulty with using value in metrics is that value is subjective and therefore not easy to quantify ... but value is much more at the core of socio-economic performance and quality of life than anything else. Value is what the recipient thinks it is worth. Putting a number on value is difficult ... but it does have utility.

As a matter of convenience, sometimes the number for value is also the number for money … but they remain two different metrics. Because there are no markets that trade in "value" it is a hyper-hazzle to monetize money. Value is what the recipient thinks it is worth.

With values, these relationships are key: (1) When value is greater than cost there is value adding; and (2) When cost is greater than value there is value destruction.

The challenge with value accounting is how to have numerical values that are an integral part of the system. The TVM solution to this is to have elements of value, just as there are elements of cost, and to have standard values that reflect the perception of value that people have. From this it becomes possible to have standard value profiles for a community ... and from this to create reports that reflect the consumption and creation of these values. The difficulty with using value in metrics is that value is subjective and therefore not easy to quantify ... but value is much more at the core of socio-economic performance and quality of life than anything else.

Relationship of value to price

If value is lower than price, there is no incentive to buy the item.

Something may have a low price, but have enormous value to the person using the product. An aspirin may have a low price ... but getting rid of a headache has big value.

Society is in a good place when goods and services have low prices and these goods and services have high value for the community.

Chapter 3-9

Where … The Spatial Attribute

Identifying Place

Many reasons place is important

The reason for "where" is that the data has way more meaning when it is associated with a place … in fact the value of data when they are not associated with place is near zero. Such data are useful for the promulgation of misinformation, but not for very much else.

A small dataset that is about a specific location can quickly show progress of the place … and the progress of the place can then be related very clearly with activities that have taken place in the place. These data can be the foundation for meaningful understanding of the relationship between socio-economic activities and outcomes in the place.

Another reason for "where" is that data need to be validated. It is difficult if not impossible to validate data when the data are not associated with a place. When data are not associated with a place the data can never be validated … and such data are likely to be unreliable if not just plain wrong.

The spatial dimension

The spatial data dimension is a core element of the TVM methodology. The physical place "anchors" the data in a way that activities, sectors, organizations, projects, etc. cannot. A physical place may be used in various ways to give the data integrity in a way that is not possible with any other entity.

For example … different dataflows from the same place at the same time reporting different things are prima facia suspect and subject to additional validation.

It is just plain ridiculous the amount of data that exist without adequate place labeling.

> Think of the number of photographs that have been taken of the situation in Haiti … millions of images, almost all without much reference to the exact place where they were taken. Perfectly nice people are taking pictures to record their concern about the disaster and the scale of the crisis … but without a spatial dimension these data are dangerous. Please also see the observation under Time … The Temporal Attribute

Methods of defining place

There are modern technology based ways of defining place … but maps have been used for centuries without the need for advanced modern technology. At risk of appearing to have a Luddite streak … computer generated maps sometimes take away from good understanding of data as it applies within a community and within a place.

> As a schoolboy, a friend and I mapped our school buildings and grounds using compass and chain … very low tech … but it put on the record a lot of

important detail. I learned to “pace” out distance with surprising accuracy.

There are many ways of defining place:

1. A building address is a location;
2. GIS coordinates can be used as a location;
3. A block can be identified
4. A building location within a block can be “paced out”;
5. A block can be located within a neighborhood;
6. A neighborhood can be located within a geographic community;
7. A community can be located within an administrative area;
8. An administrative area can be located within a country;

Roll-Up to community

For most analysis the community is used. This is the level where simple summary of activities makes the most sense.

More drill-down is possible based on the amount of data available, and any indicators there are that might suggest more detail would be of interest.

The data related to a geographic community can be rolled up to higher levels and to the national level

A community may be something other than a geographic community … for example an affinity group … but these may not be automatically rolled up to aggregate.

Technology

Place identification using technology

It has become possible using mobile technology to identify location or place simply by using the cell-phone and its built in global positioning software. This may make things easier but it may also create dependency on technology that is not really needed.

At the community level, local people know where they are without much help from technology. TVM wants to use local knowledge and capacity as much as possible.

At the same time, TVM wants to have data that may easily be combined with other data so that a bigger and more useful database is building. At some point local knowledge without electronic spatial references needs to get these attributes added for data compatibility.

Satellite imagery

Satellite imagery is a very powerful and cost effective way of getting rapid knowledge about an area and an overall understand of the topography. While satellite imagery makes it possible to accelerate learning about any location, limited, of course, to those locations where satellite imagery is available ... there is a big role for on the ground mapping.

Image 1

Image 1 shows the area around Monrovia, Liberia. The map covers around 50,000 acres of which some 15,000 acres is marsh, and very close to human habitation.

Ground surveillance will confirm whether the whole of the marsh is habitat for mosquito breeding, or just limited areas.

Image 2

Image 2 shows individual houses in a section of Monrovia. Images of this sort enable plans to be made for surveillance and for interventions. The interventions may be interior residual spraying, source control or verification that bednets are available.

The level of malaria control activity should be based on knowledge of the community and the impact of malaria in the community.

Image 3

Image 3 is of Stone Town and its outskirts in Zanzibar. It is supplied by QuickBird and incorporates data from both the visible and the near-infra-red (NIR) spectrum. A grid based matrix has been overlaid.

Chapter 3-10

When … The Time Attribute

Identifying Time … When?

Why is when important?

Facts change over time ... and without information about time, then the data serve little valuable purpose.

It is just plain ridiculous the amount of data that exist without adequate time labeling.

> Think of the number of photographs that have been taken of the situation in Haiti … millions of images, almost all without much reference to the exact time when they were taken. Perfectly nice people are taking pictures to record their concern about the disaster and the scale of the crisis … but without a time dimension these data are dangerous. Please also see the observation under Place … The Spatial Attribute

The natural sequences

There are many different time periods that may be used. The choice depends on the natural characteristic of what is being measured.

- By hour ... to show what happens at different times during a 24 hour period
- By day ... to show what happens from day to day
- By month ... to show changes month by month including seasonality
- Year on year ... to show how things progress over the longer period

The analysis of performance is complicated by multiple factors all with differing natural phasing. Data that respects the different natural phasing of various elements of a system makes it possible to manage the situation to best effect.

> **The case of malaria control**
>
> Malaria is a parasitic disease of humans transmitted by mosquitoes. Humans live many decades. Mosquitoes live only days. The parasite life cycle is also days. When malaria control interventions are done on a human timetable they do not work very effectively … but with due respect for the biology of the mosquito and the parasite impressive performance is possible. This requires timely data … very detailed every day. Totally possible but rarely done because metrics rarely are used to optimize performance in the ORDA world!

For example issues like seasonality, or time of day, all have a bearing. Cause and effect may be identified by paying careful attention to the timeline. Time series trends are great indicators of progress ... or not. Time series are simple, clear and powerful. While it is possible to do advanced statistical manipulation ... simple and clear time series tables and charts work very powerfully as well.

A plot of a single parameter shows how this parameter has changed over time ... but in isolation does not show what might have been the cause of any changes. Plotting multiple variable may show something about cause and effect. While this may be done by simple visualization for a couple of variables, a more rigorous mathematical approach is needed for large scale multivariate analysis.

Seasonality

Many data series have an annual pattern arising because of the natural seasons. A time series about weather shows a seasonal pattern … and everything in the economy that depends on weather is influenced by this and the data reflect a similar seasonality.

> When there are little data, there is a practice of using seasonality to misinform about progress and performance. Some of this is done because the data collectors and analysts are inexperienced, but some is done knowingly. It is a reprehensible practice.

Chapter 3-11

Source … The Validity of Data

Trusted Data Are Essential

Data Need To Be Believable

Data need to be right. The analysis of data that have little relationship to reality has little value ... worse, the analysis may result in bad decision making. There is a need to ensure that dataflows have integrity and there is no replacement of valid information with fictional data. There is also the need to ascertain that data that are in the system are correct through a system of validation.

GIGO: Garbage In … Garbage Out

While it is good practice to have fully normalized data in a relational system to have the most efficient data processing ... it is sometimes desirable to have redundancy in the data and dataflows so that data may be verified in an independent manner. Data should not only be right, but be seen to be right!

Identifying Source

Knowing the source is a critical determinant of the validity of data. The identity of the source of data is a powerful starting point for the validity of data. From a personal point of view … if I see it, I trust it. If I know the person who saw it and reported it, I may still trust it.

If the data come from trusted sources, the it may be possible to trust the data. All data are therefore associated with a source … and the approach is to have sources assessed for their level of trust, for the validity of their data.

Provenance

The idea of "provenance" applies in the area of data and analysis as much as it applies in the field of rare works of art. Data needs to be authentic and be a meaningful representation of the reality with which it purports to be associated. By identifying the source … and the chain of sources from which data emanates, the validity of data can be improved.

The reliability of data is easy to compromise when there is little or no validation of the source and origin of the data. There must be assurance that the data are what they purport to be. It should not be possible for data to be "highjacked" in transit and replaced by fraudulent data.

Fraud … misinformation

Modern society has much fraud and misinformation … a large part of which is never identified and called into question. The scale of fraud and misinformation is difficult to estimate, but it likely that more of the data in public circulation is wrong than is right.

The "old fashioned" responsibilities of the press to check the validity of what they published has been "costed" out of the procedures in modern press organizations … and in the "new media" space, the checking of validity has never been an important part of the culture. In the new media speed is of the essence … and right or wrong has little importance in terms of immediacy of communication, yet these data pollute the record essentially for ever.

Internal check … internal control

Business accounting has addressed the issue of internal check and internal control as an integral part of data system design for decades … but nothing like it exists for the data that are used in the prevailing dialog about the progress and performance of society. The role of media as the "fourth estate" providing a public check and balance is not working well with mis-information a pervasive problem.

Third party validation

Data should be easily verified ... and data that cannot be verified should be treated with the utmost caution.

> Sadly, this is no longer universally true because accounting principles have been superseded by various laws, rules and regulations that allow various forms of reporting of financial results that are in conflict with the underlying principles of accountancy but suit various stakeholders in the process.

The validation of data needs to be done with care. There are many techniques that may be used, and they should be varied from time to time to limit the "gaming" of the system by people and organizations that have an interest in the failure of a ubiquitous effective social and socio-economic oversight data system

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Other Matters To Consider

Intellectual property

The recognition that data have value has been important in making it possible to collect data, process data, and manage with data ... but the downside of this has been that data and related analysis has been managed as intellectual property (IP) ... and this property then being exploited for its value to its owner rather than being used for public good.

The issue of the "public right to know" is not central to much debate ... and this has made it possible for public sector performance to be very low efficiency and nobody any the wiser. What a corporate organization tells the public is only a tiny amount of what the company knows ... and is carefully presented to send a message that is designed for the stakeholders, and not much related to the underlying data and knowledge.

The rule seems to be that only data that are required by law to be accessible to the pubic are going to be accessible ... everything else is going to be secret. More than anything else, this means that society will progress way more slowly than it would where data and analysis were being used to the optimum.

The argument that the value of IP produces an incentive to use data and innovate has some merit ... but so also does the argument that professionals and scientists are not only motivated by money, but also see value in discovery as a value beyond just its money value.

Open access

The TVM methodology is to have data and analysis as much as possible openly accessible. Data and analysis that might be useful for decision making are made openly accessible as rapidly as possible. The TVM approach that makes data and analysis easily accessible contrasts with the widespread practice of treating data about public matters as a proprietary private property. Data and analysis that might put people "at risk" are not openly accessible.

Security

Open access is important, but so also is security. Security of data is a serious matter. In general data should be accessible for review and study, but not for people to change and manipulate in ways that will result in misinformation and incorrect analysis. As data becomes more important and more central to social performance and productivity, then the security of data takes on more and more importance.

Data security has many dimensions, all of which should be taken into consideration. These include (1) physical security; (2) disaster recovery; (3) hacking; (4) avoidance of misinformation; (5) theft of sensitive data; etc. Many people and organizations might seek to corrupt the data because good use of data will have the capacity to disrupt much profitable but inappropriate economic activity.

Sensitive information must be secure. Some information is quite sensitive, such as pay rates and benefit packages, and the like. Though they are sensitive, they are also important to understand since the cost of activities is very much a function of the cost of people and that is the cost of their remuneration and benefit packages.

Privacy

The matter of privacy is complex, and no one answer is universally satisfactory.

At one level personal privacy is to be encouraged and respected … most people desire a high level of privacy in their private lives, and this is reasonable.

At the same time, people expect that society is safe and secure … and for this the "authorities" need to have access to information so that bad things are prevented from happening. Privacy gets in the way of efficient security operations.

People want convenience … but they do not want anyone and everyone to have access to open information.