MULTI DIMENSION IMPACT ACCOUNTING (MDIA)

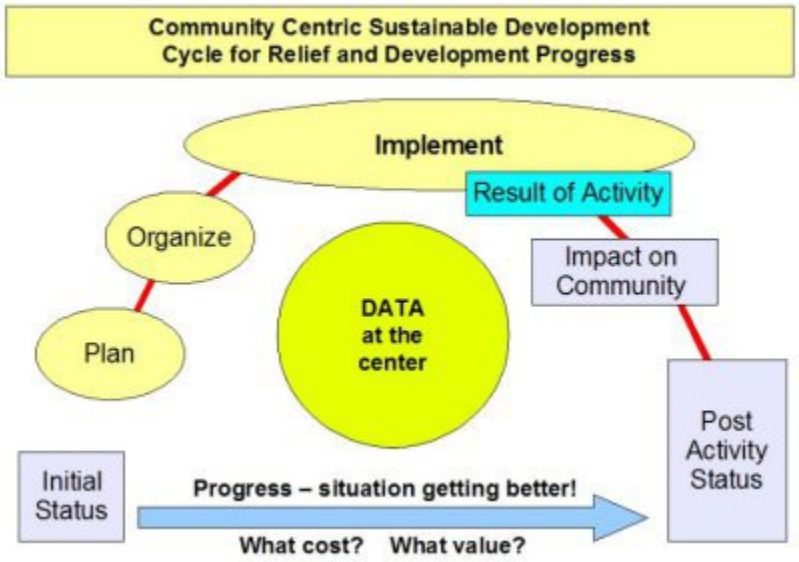
The TrueValueMetrics Book

Section IV

Data, Dataflows and Analysis

ABOUT DATA
CENTRALITY OF DATA

A fundamental concept of MDIA is that data are essential to effective decision making. The following graphic puts data at the center where it may be used for planning, for organizing, for implementation and then the measurement of the activity and its impact on the community. Overall, data may show the change from pre implementation to post implementation and address the question of how much progress there was, and how much it had cost.



Data needs to be at the center in order to be most effectively used. At one time data at the center had the potential to be a serious constraint with the key operating entities starved of what they need to know, but that should not happen in a modern information system.

The same facts should be used for everything ... and the data should be representative of facts. There might be different levels of detail ... but the essential underlying facts are the same.

And it might be advantageous to have different levels of detail so that it is easier to make decisions ... but again the underlying facts are the same.

Data are not only at the center, they are ubiquitous.

In good accountancy, there is no statistical manipulation ... no estimating ... just simple recording of simple facts.

MDIA is similar. Simple data about an economic event is collected, organized and analyzed.

In accounting the system requires that every transaction in every economic activity of the organization is recorded and these data points collected, organized and added up.

Metrics for Paradigm Change

Paradigm change is facilitated by appropriate metrics. Multi Dimension Impact Accounting (MDIA) is long overdue. The good news is that there is a lot of money and liquidity in the global economy ... the bad news is that a system to assure society that the resources are well used does not exist. The transparency and accountability needed so that the costs and the impact of economic activities are recorded and accessible to the interested public is inadequate ... it takes far too much effort for anyone to find out any of the basic facts about resource use, the costs and the impact in any location.

Some people want better metrics

The data dimension of society and the economy should be much better. The reason is not that data acquisition, organization and analysis are particularly difficult, it is more likely that data are powerful, and the story that these data will tell is not the story that many want to see told. This is not a new problem ... it is a problem since Biblical times, and will not change in the foreseeable future ... except that new tools are available so that “we the people” is not a mere platitude. Data by the people for the people is now possible.

Some organizations will resist better metrics

The MDIA framework incorporates data ... and while there is no guarantee that the major actors in society and the economy will adopt the MDIA framework, it is to be hoped that they will. However, if they do not, in due course much of the data will be acquired anyway and there will be an accounting even for those that do not want the accounting. Part of the design of MDIA is that it works even when there are important actors who do not want to participate.

Purpose of data

To facilitate smart decisions

Management is not the same as administration ... it is not academic ... it is intensely practical and pragmatic. MDIA has management central to what it is.

MDIA is not only integration of the various elements of operations that make up a comprehensive malaria abatement program ... it is also integration of performance metrics into the operational framework for management ... and the use of these data for rigorous scientific analysis.

"What gets measured gets done"

MDIA aims to facilitate decisions that result in the minimum of resources being used to get the most result.

When there is a problem, the management approach may be simply described as follows:

- There is available knowledge ... not perfect ... not totally complete ... but substantial
- Do something based on the best available knowledge ... do the best available based on what is known now
- Measure costs and measure impact ... learn lessons. What might be done better?
- Do something better ... measure costs and measure impact ... seek to use less resources and have more impact.
- Learn lessons ... Do something better ... measure costs and measure impact ... seek to use less resources and have more impact.
- Continue ... expecting the measurements to show changes in the situation ... because success requires changes in the situation
- Continue

A idea of changing state

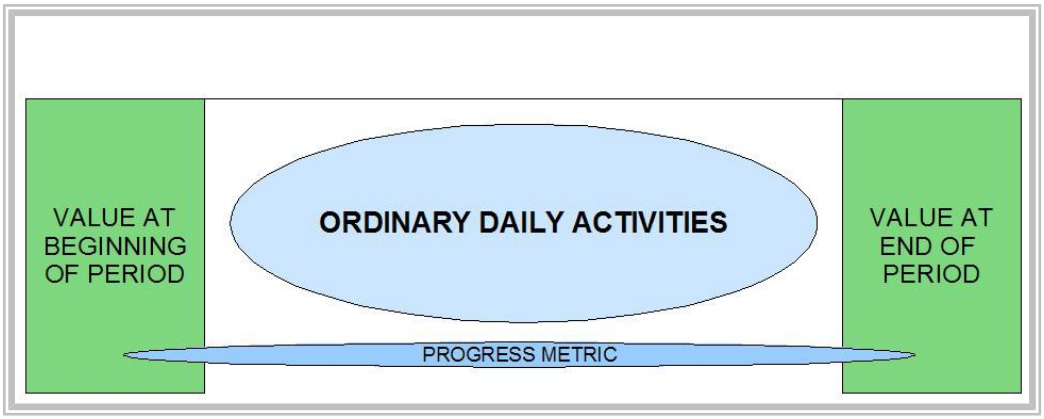
The idea of changing state as a primary metric of progress is very simple. Is the community better now than it was in the past? In the images below, the value of the community at the beginning of the period is compared to the value at the end of a period

In Case 1, the value at the end is the same as it was at the beginning . Ordinary daily activities produce what is consumed and it is a stable situation.

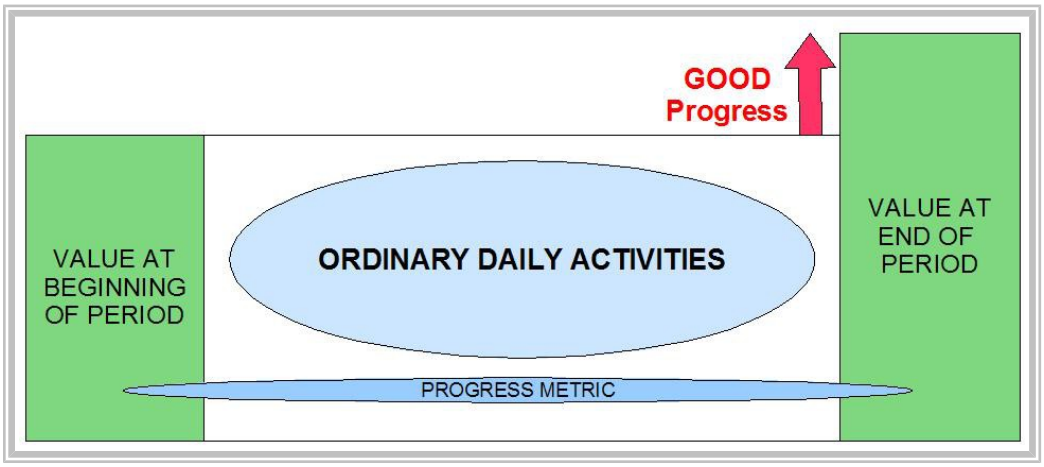
In Case 2 the value of the community is more at the end of a period than at the beginning of the period ... ordinary daily activities produce more than is consumed.

In Case 3. the value of the community is the less at the end of a period than at the beginning of the period. Ordinary daily activities result in value destruction. It is a problem situation.

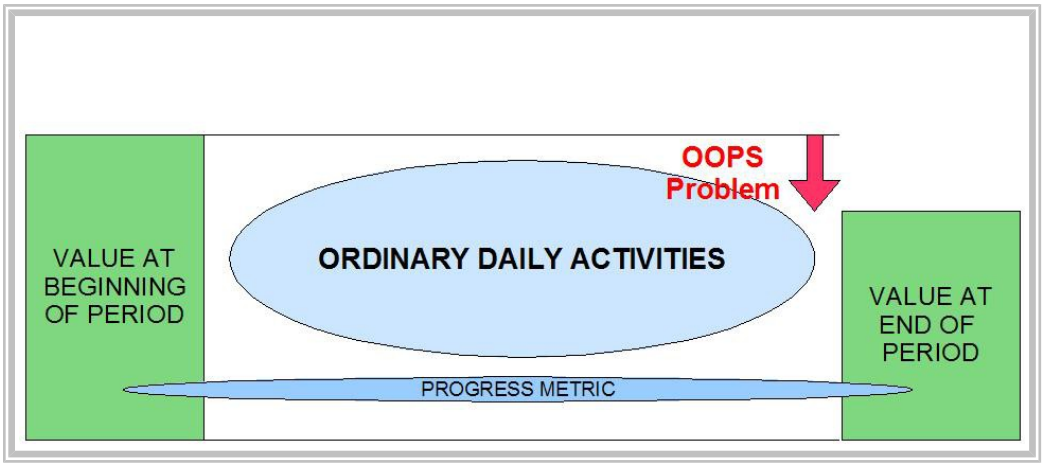
Case 1 … no progress



Case 2 … positive progress … valuadd



Case 3 … negative progress … value destruction

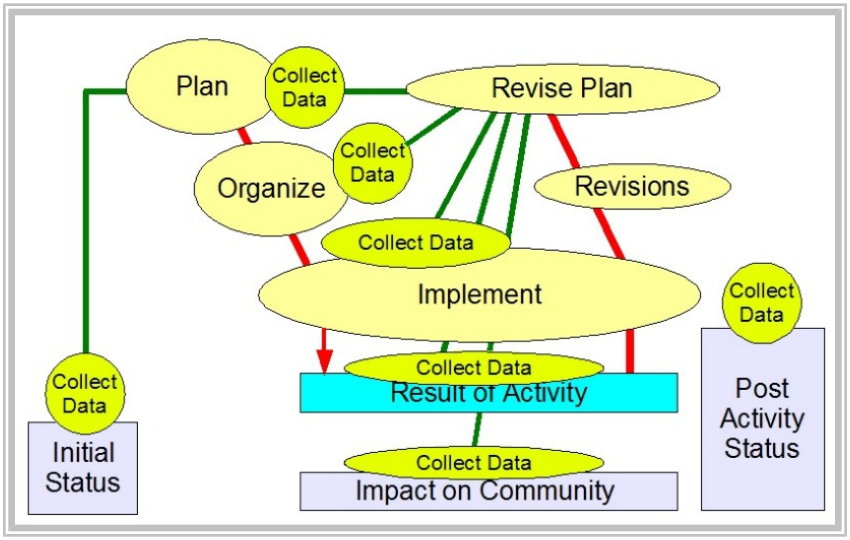


The ideas that are generic in these graphics are equally applicable for the metrics of performance for almost any economic activity, for organizations, for places, for people and for all the elements of the state of the planet.

Data at the center of everything

Data are used to ascertain the initial status and the post activity status ... that provides a metric for progress. Data are used to plan, organize and to implement. Data are used to measure the result of the implementation activity, and the impact on the community. The data answers important questions about performance ... what cost? ... what value?

The following graphic shows that every step of the management cycle needs data.



Note that in this graphic there is a the results of an activity are one thing and the impact on the community is another thing. They are not the same ... and in most situations it is very unreliable to consider result of an activity as a proxy for impact on a community.

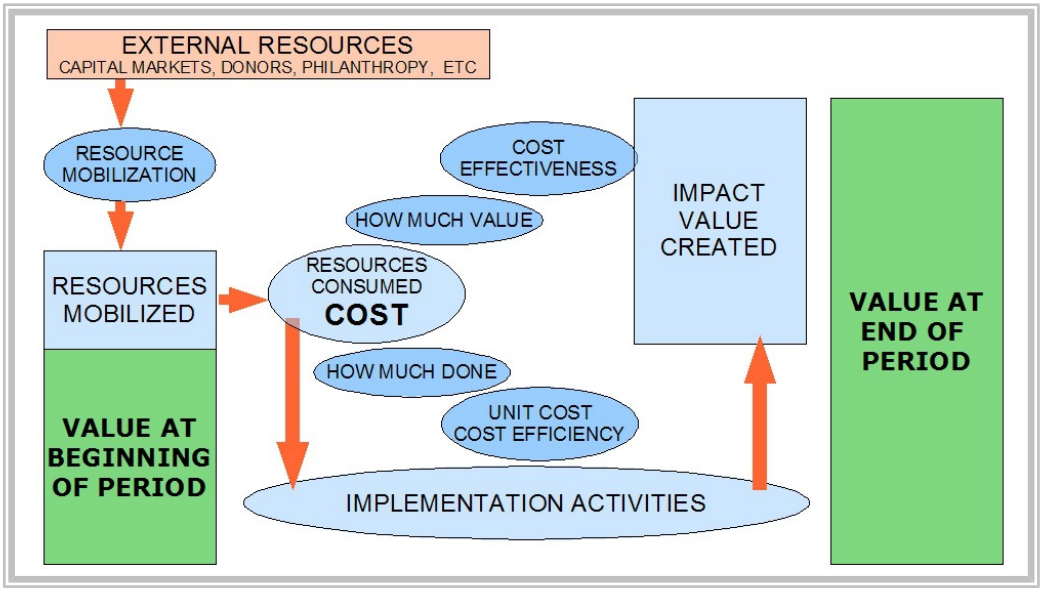
The above image shows that data are not only at the center, data are everywhere. The image was originally prepared in response to some analysis of the World Bank's project cycle which had a huge emphasis on data and numerical analysis in the project planning and appraisal stages, but almost no interest in meaningful data during implementation.

Data are needed to measure and manage the performance of everything.

How Much Cost ... What Impact ... Value?

Two key measures ... efficiency and effectiveness

CA measures progress ... measures performance ... they are related but not the same. They are both important. There are two critical measures that should be taken into consideration (1) cost efficiency ... how much interventions cost versus how much they should have cost; and (2) cost effectiveness ... how much progress or value improvement was achieved relative to the cost or resources used.



Cost efficiency

Cost efficiency may be computed for each of many different interventions, with each intervention compared to similar interventions of the same sort under different circumstances. Cost efficiency measured what something cost relative to what it should have cost.

Cost effectiveness

Cost effectiveness may be computed quite easily where there is a single intervention. How much did the intervention cost ... and what was the impact ... what was the change in value from the beginning to the end of the period. Where there are multiple interventions it is relatively easy to come up with the total cost of the interventions ... and to get the impact ... the change in value from the beginning to the end of the period.

Because there are an almost infinite number of combinations of interventions and circumstances it is a difficult analytical exercise to come up with a statistically significant or a scientifically valid conclusion about what is best, it is easy to report how much a specific set of interventions cost, how much of the intervention activity was done and what progress has been made in the community from before to after the interventions.

The following table shows the arithmetic calculations for cost effectiveness

Item	State 0	Activities	State 1	Activities	State 2
Item AAA	A0		A1		A2
Change of state (impact ... value)		B1=A1-A0		B2=A2-A1	
Cost of activities		C1		C2	
Value increment		B1		B2	
Net value adding		D1=B1-C1		D2=B2-C2	
Cost effectiveness		D1/C1		D2/C2	

How do you measure

It usually is very easy to know what to measure if two things are known:

- what are the goals or objectives; and
- what is the technology or science that is or may be used. Measure what is. Simply put ... measure what makes sense.

Cost is easy. Price is easy. Value is more difficult ... and all the more reason for having it central to the analysis system, and being able to prepare reports that look at results from different perspectives. MDIA uses a system of standard values to quantify impact and everything to do with value.

What does measurement tell you

The first thing is that what is measured is often what you are trying to do ... so when activities are measured and not impact, it can be concluded that the activities have priority over results. This is a widespread problem that MDIA addresses.

CHARACTERISTICS OF GOOD DATA

Data neutrality

Good accountancy is neutral. A good accountant does look for an answer to support a hypothesis, but rather merely presents the data so that the answer is clear. The nearest an accountant gets to an opinion is to decide what data might be important.

MDIA has to be neutral ... and the data have to be neutral. The data are merely facts about a transaction ... usually an economic transaction or a situation, a movement in time, of something that results from an economic transaction.. The data are a representation of a fact, and not an opinion or any form of judgment. Six feet is the depth of the water at a specific place at a specific time ... it is a fact, and this datapoint does not tell anything about whether six feet is a good situation or a bad situation.

Data should be a proxy for reality. Data should be neutral, and reflect a fact. Data should facilitate analysis that helps informs decision makers.

Data must be neutral in order to be valuable

Low cost ... reliable ... clear ... high value

The cost of data acquisition is an issue ... it needs to be low cost. However, reducing the cost of data acquisition must not be achieved in ways that destroy the value of the data. Using small surveys and powerful statistics is dangerous for decision making. The results are unlikely to be of meaningful value.

Good data should not cost a lot ... they should be reliable, that is they should reflect the underlying facts ... and they should be clear. Simple data often tell a lot more than complex data because of the clarity, something that accountancy has been concerned about since the advent of financial reporting.

Easy data

MDIA uses 'easy data' as much as possible. The data that are acquired should always be simple and easy to collect. Lots of data about a simple thing will be of more decision making value than the same amount of data about a complex thing. Where things are complex, it becomes unclear about what is important and what is not. With simple things, it is quite clear what is going on.

Granularity

Data are useful for decision making when they are able to show “cause and effect”. The data should help in the understanding of the question “If this is done ... this will be the result”. The starting point for this is to have data to show that when “this was done ... this was the result”

A simple system is always easier to understand than a complex system ... the community is a much simpler system than a nation ... a small geographic part of a community is yet again simpler.

Drill down only works when the base data are available ... and MDIA has data being collected that are extremely detailed with both temporal and spatial characteristics.

Aggregation

Aggregation is a good way to summarize data ... but it does not help a lot with the understanding of how complex systems at the community level are working.

Average

Averages normally don't tell very much. Data are needed to show differences ... and then explain differences. An average does not show this ... but a dataset might provide the explanation.

Time and place

Knowing about time and place makes it possible to put data into context ... to give the data perspective.

Timely

Data have the most value when they are available when they are needed. Many biological systems change rapidly over time ... slow data are ofter useless data.

Data a record of reality

Data need to be neutral ... but data also need to be a record of reality. This is not always easy. Accountancy has always operated with simple data that are easy to understand and clearly reflect the facts of the transaction. In most accountancy the reality of a transaction can be recorded by describing what it is, when, where, how many, unit value (cost of price) and total value of the transaction.

But data about facts that do not have the properties of economic transaction may be recorded in a similar manner ... weather is a good example. Rainfall, temperature, humidity, wind speed, wind direction are a set of facts that are interesting ... data can be collected and put in the community record. These data need to be identified with time, place and the person responsible for making the record. These data may help explain some of the successes and failures of the community.

Maybe these weather data will show something about health in the community ... is malaria increased when there is more rainfall ... or not. Does the direction of the wind make a difference? But in order to do this analysis there has to be neutral data about the health situation. Maybe data about cases reported at the community health clinic is a starting pint for data about the health situation.

Performance proxies

Data are efficient when they provide the foundation for understanding and when the cost is low. Techniques should always be adopted that facilitate understanding and keep costs low. The specific approach will depend on the metric ... for example, the prevalence of the malaria parasite may be monitored using just a few sentinel sites ... and the work done may be further reduced by monitoring weather and only doing testing when temperature

and rainfall indicate that potential conditions for malaria parasite transmission are present.

On time … in time … but not real time

Time is very important.

Good organizations organize their data collection so that the data are in time and on time.

In contrast the typical inefficient organization rarely have data in time and on time ... rather they engage with data about performance as late as possible when it is going to have the least impact on the prevailing modus operandi.

Data reliability

The data associated with accountancy are boring ... but the system does what it can to ensure that the data are reliable and may be trusted. The techniques used for this include organization so that there is both internal control and internal check. The quality of accountancy data are enhanced by the professionalism of accountants who address the details that is so essential to data reliability. The data reliability of accountancy is very much greater than what may be achieved using statistical method on top of small surveys. While there is a case for the statistical approach in some limited circumstances, it is not a useful alternative for financial control and for most accountancy reporting purposes.

Data independence … accounting independence

There is a need to have data ... and accounting ... independent. This helps to ensure that the data and the accounting reports reflect reality and are not merely some fiction desired by operating management. There are many different approaches that can be taken to have this independence ... it is, however, usually not enough to have an independent audit to provide this independent view when the structure itself is deeply flawed.

Inadequate independence

Most accounting data originate in an operating environment. In the relief and development industry most activities are funded by donors who want feedback, and frequently donors fund Monitoring and Evaluation (M&E) to get this feedback ... but is this good enough. In some cases it is not, and in other cases the feedback is appropriate ... but there is no systemic internal control or internal check that ensures that the data are reliable and neutral.

Modularity

Modularity helps make something manageable ... and makes it useful more rapidly. This is applied in MDIA to make little things useful while waiting for other detail. In the MDIA framework the community data can be worked on section by section ... bits of the economic activity analysis can be done. Modularity helps make something manageable ... and makes it useful more rapidly. This can be applied in MDIA to make little things useful while waiting for everything to be deployed.

Efficiency

Efficiency comes more from engineering than from accountancy ... but the idea is very relevant. Productivity is something similar to efficiency, as is cost effectiveness. In each case the amount of output is being related to the amount of input that went into the activity and its result.

Cost of data and analysis

This comes back tot he question of what is the purpose of data and analysis. The cost must be small relative to the value of better decisions. Where data and analysis are being used to improve socio-economic performance in low income communities, the cost of the system must be very low ... and using only ultra low cost technology and systems. Thoug the community may be low income, the value of good data and analysis may be very high in social valuadd terms, though maybe not in the prevailing money profit and GDP growth terms. A good system does not come free, but it should not be excessively expensive.

Good design especially of the data architecture and the analytical codes helps to reduce cost without sacrificing analytical power. A system like MDIA can be deployed with very low costs making use of existing available infrastructure. Good design, together with effective use of technology makes MDIA much lower in cost than its value.

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.*

About Metrics

Data are about a simple fact or single event or transaction. Metrics are something more ... about the way the system is behaving based on analysis of the data.

The MDIA system is one of iterative learning ... simple knowledge is way better than no knowledge.

Take a community ... the starting point may be knowing nothing about a community. The steps might be as follows:

- Knowing the name of the community
- Knowing where it is
- Knowing how big it is
- Knowing what it does for employment

- Knowing what it does for entertainment
- Knowing about its infrastructure
- Knowing about its health
- Knowing about its education
- Knowing about its malaria
- Knowing about it mosquitoes
- And so on

Changes over time

Knowing how it compares today with what it was like at another time.

Depending on what bit of the community facts ... the time series should be hourly, daily, weekly, monthly or annually.

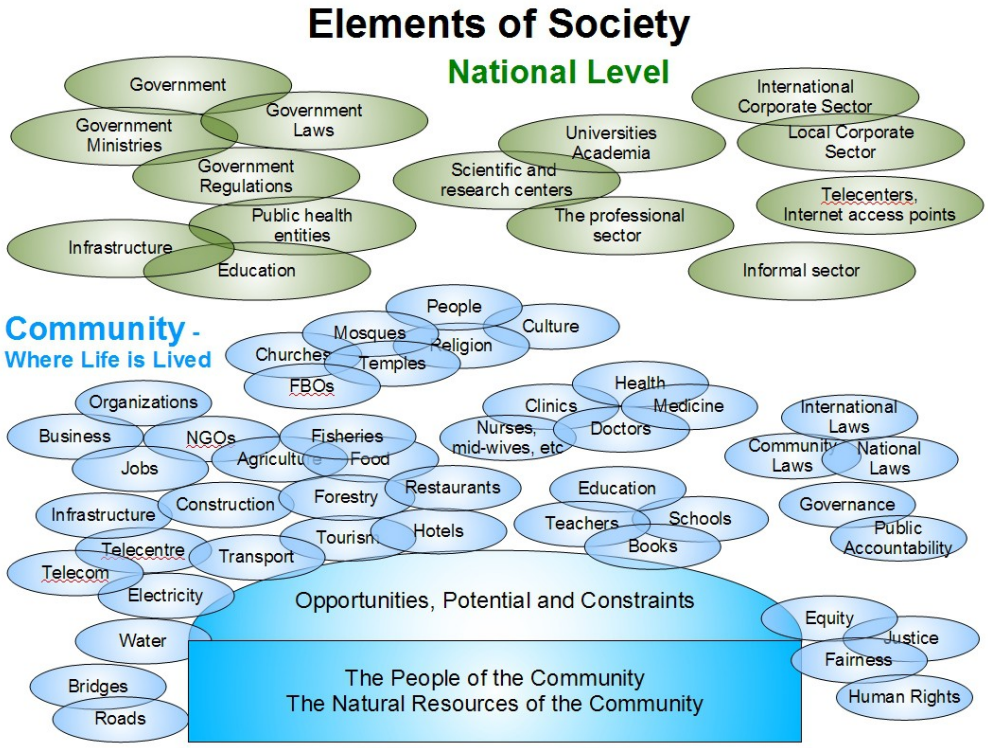
Time series is very powerful

And while two time series do not prove cause and effect ... they might well be a good indicator of cause and effect, and a basis for initial decisions about what needs to be done.

Better metrics for a complex society

Society is very complex

Society is very complex. The following graphic shows some of this complexity ... in a very simplified manner. There is complexity at the national level and the international level (not shown) and all sorts of complex detail at the community level. An aggregate or average is not very useful for decision making ... what is needed is granular data that reflects a real reality ... not a distant derivative of reality!



It is readily apparent that the complexity at the community level is a significant analytical challenge ... and when aggregated to the national level ... or the global level ... only some very broad analysis results will have any meaning at all.

Local and global data analysis

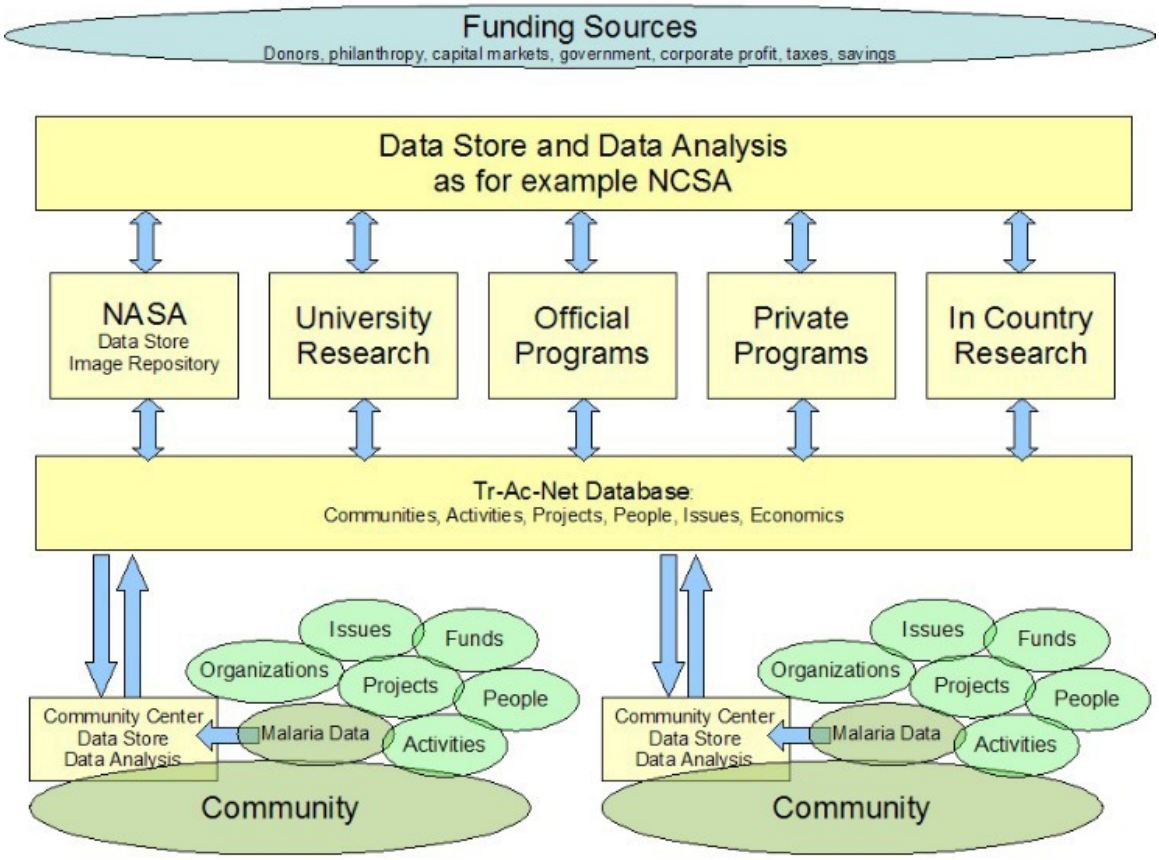
In the CA methodology, the key goal of data collection is to have data that help improve performance. Local data collection ... local analysis ... local action is the cycle that improves performance most directly and most quickly.

Data may be multi-tasked. “Collect once ... use many” is a data management idea that goes back to the very early days of electronic data processing (EDP). Thus, the data may also facilitate easy oversight ... ensuring that the operational decisions are getting good results ... and if not allows for rapid response so that the important questions are asked, such as: (1) is the result because of poor operations that management must addressed

locally; or, (2) is the result because there are problems emerging, such as resistance, that need to be addressed on at all levels, local, national and global.

The most cost effective utilization of data is at the local level, at a national level and at a global level. The specific granular data available at the local level and the analysis of very large datasets at the global level facilitate good local decisions and powerful data-mining and the identification of "best practice" that are impossible to identify with local analysis alone.

The graphic below shows the idea of local use of data in the community ... with aggregation to higher levels. This shows that community centric data gets used at the community level to do local analysis and get local action ... and then these data are also used to have an oversight level ... and then again at a global academic and scientific level.



While the data may be of limited use when aggregated ... data can be of critical value in the local context, especially in the context of managing the malaria abatement interventions.

Experts in the field recognize that mosquitoes and malaria have behaviors that are determines in large part by the facts of a specific location ... and accordingly all communities are going to have different needs.

The prevailing management approach where national and regional averages are used for planning and prioritization is fundamentally flawed ... and wasting resources in an unconscionable way. Organizing for data and decision making to be community centric will make it possible for interventions to be implemented only where they are needed and in the most efficient way.

Using the local data in an aggregated manner using a very large database and modern data mining techniques will add value to the data that are also of high value and utility at the community level ... a win-win for both the community and for the global malaria community of researchers.

This is not a complex idea, and there is no reason why there cannot be quick, easy and useful data about this, and no reason why this cannot be applied within the framework of the IMM program. This is shown in the following series of graphics. There is a status at the start ... there are activities to control malaria ... and there is a status at the end. There are costs for the activities that result in an improvement in the status from the beginning of the period to the end.

Managing for Cost Effective Progress

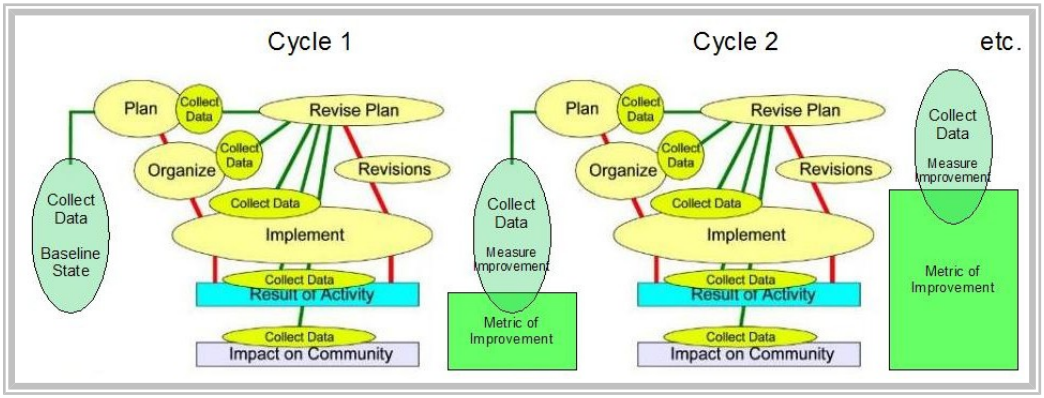
In order to be the most useful, the data must be simple, timely and clear ... and not cost a lot to collect. This basic idea replicates throughout the MDIA framework. MDIA has data at the center. Data are needed to develop management information which is central to the process of management ... the management cycle.

"Management information is the least amount of information that enables a good decision to be made in a timely way."

The management cycle has the following form: (1) Collect data, do analysis; (2) plan and organize; (3) implement; and (4) measure and analyze again.

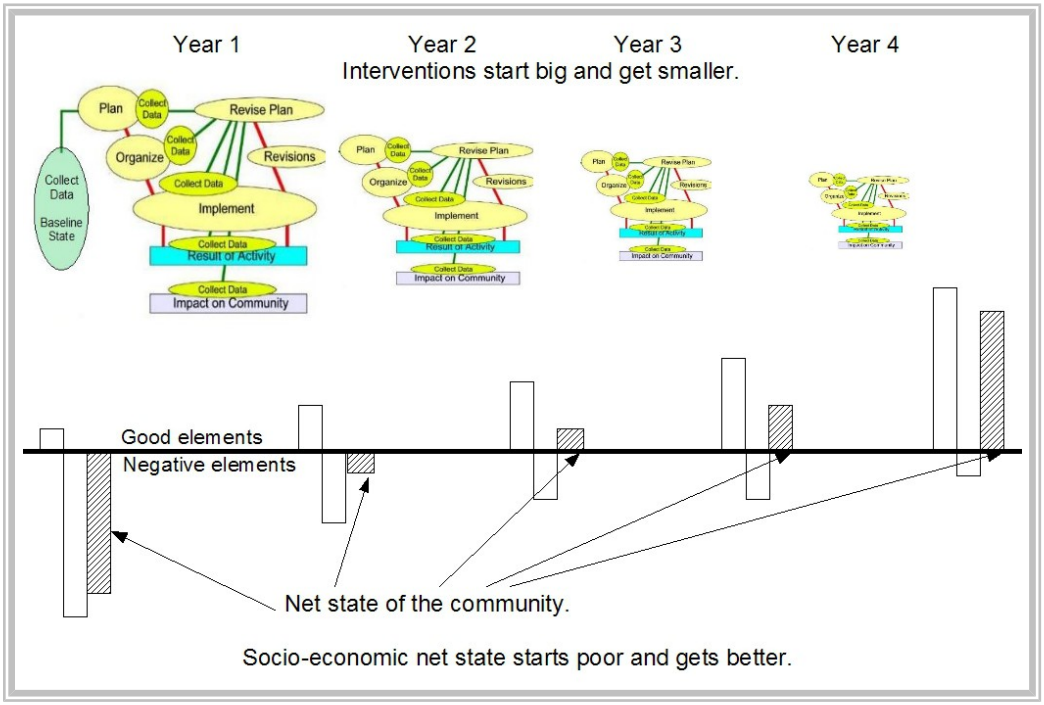
High performance programs integrate data collection, analysis, planning, action, more data collection, more planning, more action in a perpetual process. These are reflected in the following schematic. Everything has a data component. The basic construct is not done once but is repeated over and over again ... data are collected and used for decision making all the time.

The ultimate measure of success is whether the change between the initial status and the post activity status has a value that (substantially) exceeds the costs. The above schematic shows this as a box "Metric of Improvement".



In corporate accountancy there is both balance sheet and operating statement as an integrated whole ... similarly MDIA has the state of the community and the economic activities of the community. Corporate accountancy has focus on money transactions and financial profit ... MDIA takes into account the broader idea of social value creation and destruction

Over multiple cycles the aim is for the scale of the interventions to diminish and for the impact on community to get better and better, and the bad things to get smaller. The following depicts this graphically over a four year cycle. The interventions start big and get smaller while the net socio-economic state starts poor and gets better.



In this graphic the initial condition reflects a high level of socio-economic burden which over time diminishes, yielding socio-economic improvement. Over time the amount of

activity to improve the situation and sustain the improvement diminishes. This is the essence of success and sustainability.

Characteristics of the data needed

The data that are needed are data that go to the heart of all the issues that have importance. The data flows are organized so that all concerned are making good decisions and are seen to be making good decisions. Data are best when they are quick, clear and simple ... and low cost. When the situation is under control, the data will confirm what is expected. A situation is out of control when what actually is happening is very different from what was expected.

> *It is important to note that cost and management data have a different purpose than the statistical data used in, for example, clinical trials. Generally speaking, statistics used in cost accounting give results that are frequently just plain silly ... while a drill down to critical data in the IMM framework will provide useful and very relevant information.*

Purpose of data

Data are important ... but not more and more data, but rather data that are more and more useful. MDIA embraces the following idea:

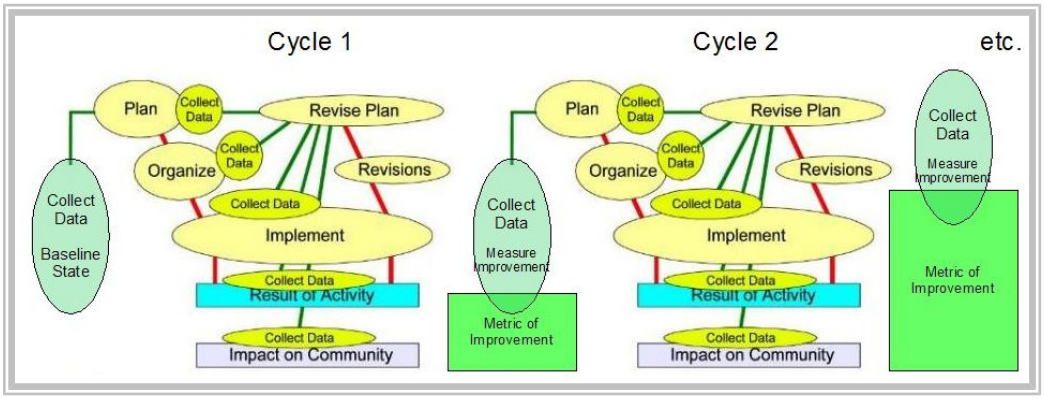
"Management information is the least amount of information that enables a good decision to be made in a timely way."

The purpose of data is to facilitate progress ... to manage scarce resources so that there is a better future. These data are important because:

"What gets measured gets done"

The data are the foundation for performance measurement. The MDIA framework has a focus on community and the social benefit that inures to the community from economic activity as well as the impact on people and planet and the performance of an organization, for-profit or not-for-profit.

In this system there is a continuum of metrics that inform decisions all the time. Data are at the center of everything and progress is achieved over time ... a continuum of progress:



State data and activity data

MDIA data are of two types: (1) state of the society data; and, (2) socio-economic activity data. This is similar to the reporting concepts of corporate accounting where there is a balance sheet (that describes a state) and the operating statement or profit and loss account (that describes activities).

State data

State data are the data that show the situation ... like a corporate balance sheet. They are mainly data that changes rather slowly. The change in state data from year to year is a reliable measure of socio-economic progress. Community and health infrastructure data are state data ... but important because these data show the limitations of the available infrastructure and serve to explain other aspects of community performance.

> *When the data show there is no hospital, no clinic, no doctor, no medicine, no nurse and there is a population of 100,000 people ... the projection of health outcomes is not going to be very favorable. The anticipated health outcomes deteriorate further when data about food shortage, no safe potable water, inadequate sanitation, etc. also become part of the state of the society data.*

ORGANIZING DATA

Introduction to data organization

My first experience running a corporate management information system was on top of a 1966 IBM 1401 with just 4K of main memory. We did some fairly sophisticated resource management planning on this computer, together with all the financial and analytical accounting. The key to making this computer work was to have extremely rigorous organization of the data to avoid the GIGO problem ... garbage in / garbage out.

The ability of a computer to sort out disorganized data is very useful, but it is not always the best thing to do. Data are just a part of a management system, and the most value will be achieved from the system when there is meaningful feedback as a result of data and analysis.

In many cases, the act of data collection provides real time feedback about the state of something and immediately suggest ways in which the state may be improved.

But a little effort in organizing data at the beginning can be helpful all the way through the process of analysis, whether it is done using a computer or by any other means.

Organizing data in an accounting system ... accounts

Data in an accounting system are organized into 'accounts'. All transactions of a similar type are put together in an 'account' and from time to time these transactions are 'added up' and used in accounting reports.

Double entry and 'balance'

The data of an accounting system are especially powerful because they are part of a system that has an inherent coherence. The system is founded on accountancy's double entry principles with every transaction embracing the idea of “debit” and “credit” ... and the main approach to summarization organized around the idea of “balance sheet accounts” and “operating statement” accounts.

This enables some very powerful techniques for the management and control of resources, and for routines like 'incomplete records' that may be used to fill in gaps in information that would otherwise stay unresolved. This is more useful than massive statistical manipulation of small datasets without any application of accounting's powerful double entry construct.

Debit and credit

Every transaction has an accuracy check component ... that is the balancing of the debit amount and the credit amount. The check is, however, more substantive than mere arithmetic ... the amount of resource paid out equals the cost of the item acquired.

Another example ... the amount of money received equals the revenue associated with the sale of the item.

Operating statement accounts

In the example, the revenue is an operating statement account. Where the cost is related to an operating transaction such as the payment of electricity for the factory, this is also an operating statement account. Where the item acquired lasts for any length of time the item is accounted for through the balance sheet accounts ... and recorded in the operating statement accounts as the item is used and its value goes down.

Balance sheet accounts

Where the cost relates to an item that lasts any length of time, the transactions is accounted for with balance sheet accounts. An item acquired is paid for (cash is disbursed and cash balance goes down) and the item is either put into inventory, a balance sheet account, or is recorded as a fixed asset, another balance sheet account. As these items are consumed, there is a recording in the operating statement accounts ...balance sheet inventory reduces and there is an increase in operating statement cost of sales ... or, in the case of fixed assets, the provision for depreciation increases and the operating statement charge for depreciation goes up.

Powerful and critical concept

These ideas are not very complicated, but they are very powerful. They facilitate a very simple presentation of reality without getting complicated. The concept scales and facilitates a simple report for very large scale activities. The underlying concept pf balance, however, never should change.

Early warning of crisis

When the balance concept is breached ... there is the making of crisis. This has become more and more common with corporate accountancy and the rule based techniques that allow certain future liabilities to be ignored and not recorded on the balance sheet ... unfunded pension liabilities and retiree health benefits are one notorious example. There are others.

Derived data from the accounting construct

A powerful technique that emerges because of the structure of accounting is the use of "incomplete records and standards" to derive data that would otherwise be very difficult or impossible to obtain at a reasonable cost.

In business accounting it is possible to prepare a full set of financial statements from incomplete records ... knowledge of the balance sheet accounts makes it possible to deduce some of the key facts about the operating statement, including the most critical fact, the profit for the period. Many elements of the operating statement may be deduced from records that exist, but are not formally included in the (missing) accounts. For example ... data about payroll may be obtained by looking at the payroll record, even

where there is no posting to the accounting records ... data about some costs can be obtained by reference to cheques and bank records ... a lot of the blanks can be filled in.

But the critical control in incomplete records is that the change in the balance sheet is the same as the operating profit (surplus or deficit). Incomplete records is the key technique that makes it possible for MDIA to be valuable a long time before it is complete ... in fact cost effective Value Accountancy is unlikely to ever come from complete datasets ... but is going to come from derived data.

TVM valuadd reporting is likely to be very useful very quickly as rapid analysis is done of data that shows an issue is arising and there is a disconnect between resources deployed and results being achieved.

Standards are a way for accountancy to simplify the potentially complex area of costing. In MDIA standards are central to an understanding of cost performance ... but they are also used to help understand impact and the value adding in the community.

The relational construct

The data about socio-economic performance may be organized using a normalized relational construct. MDIA 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.*

QUANTIFICATION OF VALUE

Measurement requires units of quantification

Measurement is a step toward creating value

The process of measurement changes the reality of what is being measured. This is a well known problem in science at the limits of knowledge, but it is also a problem in the everyday world of life and living.

Human behavior

The question was whether or not improved lighting in the factory improved production rates or not? It turned out that production stabilized at the same level no matter whether the lighting was brighter or dimmer. What appeared to improve production was a change in the lighting ... either brightening or dimming. In other words, simply paying attention to people was what really mattered. In socio-economic measurement, it might be expected that there will be some beneficial result merely by doing data collection.

Making measurements

I learned something about measurement as an engineering student. To understand something, you have to make measurements. If you want to understand causality ... measure what you are doing and measure the impact.

As an accountant trying to get business managers to make critical decisions, we measured everything that seemed to have potential importance. We got the most impact when what we measured had real relevance to the people doing the work. For the shipping department, measuring how many miles a truck drove per tire was important ... and the supervisor of that department knew and cared a lot about it. And when the purchasing department also understood the matter ... the company progressed. Measurement helped identify its importance and keep score so that responsible people could be given credit.

The lesson for MDIA is that we need to measure what is important for the community ... and then get the understanding translated into action that translates into progress.

Community measurements

The lesson for MDIA is that we need to measure what is important for the community ... and then get the understanding translated into action that translated into progress.

MORE TO DO

Value is not created when data are collected, nor when analysis is done. Value is created when the understanding helps get better decisions made and there are better outcomes. Value only gets created when something is built ... when jobs are created ... when constraints are removed ... etc. The is no value increment from added understanding that stay in purely academic circles and is never used.

Academia - huge amount of low value effort

Academic expenditures have grown substantially over the past several decades ... but have the results kept pace. Have the results justified these increased expenditures.

The data are not easy to find ... but it would appear that the activities favored by the academic community are high in visibility and rather low in value. The two key outputs seem to be study that leads to a PhD qualification, and research that furthers an academic career. From a personal perspective these are both fine ... but the global social value is not so clear.

The brain power that is available in the academic setting is impressive ... but it has little value until it is mobilized to do work that has value. It is not at all clear what work being done by the academic community has value ... such metrics broadly speaking do not exist!

FOCUS TO MAXIMISE IMPACT

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.

MDIA is not a complete management system … it is only part of a management system. It is an important part … but only a part. MDIA provides a way to do "scorekeeping" and to have "stats" so that performance can be improved. The data and metrics of MDIA 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. MDIA 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 MDIA 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

MDIA 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 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. MDIA 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

Materiality … don't sweat the small stuff

The purpose of MDIA 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.

Ubiquitous …data are everywhere

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. MDIA 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.

TYPES OF 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.

There are several different types of data ... and a good system will work on each type of data in the most appropriate manner. One way to categorize data is as follows:

1. Permanent data;
2. Transaction data; and
3. Summary data.

Permanent data

Some data change very slowly, and the update for these data can be infrequent. The methods used for updating may also be low cost and simple without causing inefficiencies. These data are permanent data ... they can be put into the record once, and rarely change.

Example of Permanent Data

My childhood home was in Okehampton, Devon ... in the Southwest of England. It was a small market town with a population of around 4,000 and on the road through central Devonshire to Cornwall. When William the Conqueror had the Domesday Book prepared in the years just after 1066 ... Okehampton was in the same strategic location and a castle was built to fortify the Norman frontier. The castle is in ruins ... but the physical geography remains the same, 900 plus years later. Okehampton ... the place ... little changed over 900 plus years. Some of the data about place changes very slowly.

Though there is a huge amount of data ... surprisingly little is organized to inform about the status and progress of communities. In many cases these data are very slow to change ... life is not much different in many communities than it was years ago ... generations ago ... centuries ago.

The first challenge of MDIA is to put some of the permanent data on the record for as many communities as possible.

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.

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

Transaction data are many and often require real time response. These data need to be put on the record in a very different manner in order to be of much value. Modern data processing techniques are powerful and are being used in the corporate environment to improve corporate performance. Use of Big Data and efficient OLAP have changed the data foundation inside many corporate organizations and are being used by financial organizations to improve their profit performance in the capital markets.

Equivalent techniques have not been developed and deployed for any of the big questions about society and the economy that impact people, place and planet. Statistical techniques can be helpful ... but in many situations the use of accounting methods may be more powerful than statistical methods.

In accountancy all transaction data are put into the record ... and only one operation is done on these data, that of putting the data into accumulators ... accounts ... and adding them up. For MDIA, this is problematic, at any rate at an acceptable cost. So how may the information carried by transaction data be handled at an acceptable affordable cost.

In money profit accountancy transaction data are recorded in a system that "adds the data" so that there is a useful summary ... for example: the total of a specific types of transaction over a period of time may be accumulated and from this a Profit and Loss Account can be prepared.

Because of the double entry characteristic of accountancy, the transactions also add up so that a Balance Sheet may be prepared. In the accountancy construct the change in the balance sheet from the beginning to the end of a period is the same as the profit or loss for the period.

Another use of data is to help in the understanding of behavior ... how things change as the situation changes:

- How do costs behave;
- How do prices and revenues behave; and
- How do values behave

While this may not be known at an academic or senior level, it is common for these critical pieces of information to be understood by operating staff.

The challenge is to put these various elements together so that there is a cost effective understanding of the situation in a community and the way in which the transactions in the community are impacting the community.

Change as aggregation of transaction data

Transaction data are changing all the time. Transaction dataflows are high volume … millions or billions of transactions within accounting systems everywhere … and socio-economic transactions in society at large. This is transient data that 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.

Summary data

One of the ways in which accountancy makes for efficiency is that the summary data are simple to prepare and easy to understand. Simply put, accounting reports are no more complicated for a very large operating entity as for a small one ... a rather small number

of accounts are used ... but while the number of transactions recorded in the account may go up ... there is only one total for the period no matter how many transactions.

Accounts are nothing more than a collection of transactions processed in a common organized manner and 'added up' ... anything more, and the reports cannot be said to be a true and fair representation of the activities of the organization. Transactions are the source material for preparing summary data and for the preparation of accounts and financial reports.

The only operation that accountants want to see done on transaction data is the simple operation of adding ... no statistics ... nothing sophisticated.

No matter how big an organization ... summaries are short

Part of the genius of accountancy is that no matter how big the organization the summaries are short. While any analysis that is based on transactions must scale based on the volume of transactions ... which may constrain performance and be expensive ... accounting summaries, that is, the financial statements or reports, derived from accounts may be analyzed very effectively and very simply. This is a powerful tool in corporate accountancy, but unusual up to now outside the corporate organization.

Accounting data are a powerful component of modern corporate management information. Similar use of data are needed for the broader economy and society. This is what MDIA is all about.

Executive data about the organization

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 MDIA 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.

NOT A SINGULAR FOCUS

MULTI-DIMENSION, MULTI-PERSPECTIVE

The core design philosophy of MDIA is that data will show different views of reality depending on the perspective.

These are the multiple perspectives of importance... the perspective of:

- the unique economic activity;
- the community (the place);
- the organization;
- people;
  - the individual as an employee;
  - the individual as an investor;
  - the individual as an executive;
  - the individual as a family member;
  - the family (people);
  - the community (people);
- the product

The unique economic activity

The structure of a corporate organization is a determinant of the manner in which performance data of the corporate organization is accounted for and reported. There are strict rule that apply to the process of aggregation or consolidation.

In MDIA the architecture of the data and the methods of analysis follow rules that are somewhat similar. The core is a unique economic activity. The data about an economic activity may be consolidated in three separate ways:

1. Summarized to place
2. Summarized to organization
3. Summarized to product

The place

There is rather little data that are about the place that have the same dynamic as the data about the performance of an organization. Maybe once a decade there is a census to find out something about the people, but it is quite little relative to the data that flow through an organization.

The organization

Over the past fifty years the performance of the organization has been optimized by several generations of management, most of whom went through an education that had a focus on adding value for the organization and its investors, and essentially ignoring the impact of the organization's activity on people and planet.

In MDIA the data about economic activities are summarized to show both money profit performance and impact on people and planet.

Personal data … another sort of summary

Nothing much of importance is going to happen until data of importance is able to be summarized in a useful way at the individual level. This has become possible with modern technology, but the space is dominated by summary information design to inform the individual in all the wrong ways.

Product

In the modern market economy, there is a deluge if information about products, almost all of which originates from corporate advertising and band PR, offset to some extent by government regulation about what 'must be told' usually in small print on labels. Relative the the flood of corporate information about the product, there is relatively little … almost none … about the product as it affects people and planet in the course of its life cycle.

A data summary about the product using the parameters of MDIA will change this in a significant way.

QUALITATIVE INFORMATION

More of this than anything else, and not much of great utility. Worse, there is now more of this being created every day, making the problem of sorting out the important information more and more difficult as time goes by.

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.

Good performance reporting 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. -

QUANTITATIVE INFORMATION

Numbers help in many ways

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. MDIA 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.

Metrics about key items

Many different units of measure

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.

Statistics of limited utility

There are many situations where statistics don't cut it.

How big is the fishing fleet?

These data were meant to be compiled for me prior to my arrival to do a fisheries resource management study. But the researchers failed totally to get any meaningful data because they were trying to figure out how to "sample" a fishing fleet and its operations and then use statistical calculations to get some results.

To get data about the fishing fleet ... a better way was to use the Fisheries Department data on fishing boat registrations ... a permanent record of all fishing boat registrations ever ... and then sample this to do physical validation of the data and confirm something about the validity of the dataset.

What is the fishing effort?

To get data about fishing effort ... it was possible to classify the fishing fleet into different types of vessel, learn something about each type of fishing and then get data about how much of the fleet was operating every day. These data gave a very good measure of the fishing effort not only for the fishing fleet as a whole, but for the various fish catches.

An approach that was driven by an analytical accounting mindset yielded more information rather than less ... had more accuracy than statistical method would have had ... was done in less time and with far less cost.

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.

Modern money … changing in size all the time

Money is no longer a good standard for measurement. Maybe it was a reasonable measure when money was still 'on the gold standard', but that ended in the early 1970s.

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.

Coffee standard

I often refer to my 'coffee standard' of money. In 1960 when I first visited the United States I was able to buy a cup of coffee for 5cents, There was a big discussion in the business press about whether the initiative of Dunkin Donuts to sell a cup of coffee at 10 cents could fly. Dunkin Donuts was arguing that people would pay this higher amount if the coffee was freshly brewed. Now, some 50 years later, various vendors of coffee are pricing their product at $2.00 and up, depending on the variety. I argue that the coffee is pretty much the same, it is the $ that has changed.

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.

The money price of a house

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!

But money changes in value in other ways as well.

Money … one quantity by variable value

If I have no money, and my family is hungry and we have no food, a little money has a huge value. If, on the other hand I am not sure whether or not to buy a handbag for $5,000, the value of money is not very much. The idea that money has the same value in all circumstances is just not supported by any reality check.

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.

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 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.

The main money measures of business activities

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 misinform 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.

The measures for the state of the economy

Capital 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 a 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.

Why GDP is still being used

There are no good reasons why GDP is being used an an important economic performance metric. The bad reason is probably the simple fact that GDP growth makes it much easier to have profit growth than a non-growth economy, and profit growth usually translates into stock price growth and more wealth for investors. With the prevailing metrics that focus only on the wealth effects of profit and capital market performance, then it is advantageous to maintain the importance of the GDP growth metric.

There are all sorts of arguments used to justify the ongoing use of GDP as a major economic performance metric.

> *Some years ago (2007) I was at a conference where economic progress was being discussed. One of the break-out workshops was about GDP and economic measurement. Several of the staff of the Bureau of National*

Statistics were present, and they described the difficulties of making changes in the work they did. My takeaway was that it would be impossible to change until some high level leadership took charge, at which time things would change very quickly. In the meantime the status quo is better than change … for the incumbent elite.

VALUE QUANTIFICATION

Value is important and must be quantified

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, personal and very 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 a 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.

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.

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Value numbers mainly missing

Value is everywhere … but value is 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. MDIA has value at its core. Value is as central in MDIA as profit is for profit corporate reporting systems. The value of a community ... or society ... is the key measure in MDIA 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.

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Using standard value to quantify value

The MDIA 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 in the state of the community

The value balance sheet of the community includes a quantification of quality of life. To make this practical and useful, MDIA 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.

MDIA 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.

The case of different 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:

- Family;
- Friends and community;
- Health … wellness;
- Education … skills;
- Wealth;
- Career Opportunity;
- Age … gender
- Security

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-hassle 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.

WHERE … THE SPATIAL ATTRIBUTE

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.

The following images have been obtained from freely accessible web sources. They are good and getting better ... but have important limitations.

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

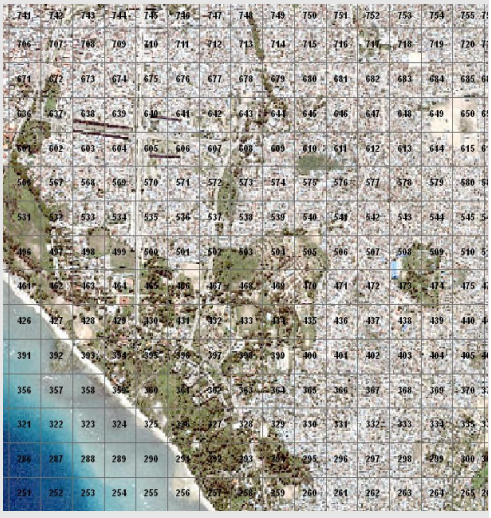


Image 3 is of Stone Town and its outskirts in Zanzibar. It is supplied by QuickBird and incorporates data from both the visible and the near-infra-red (NIR) spectrum. A grid based matrix has been overlaid.

WHEN … THE TIME ATTRIBUTE

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.

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.

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.

SOURCE- PROVENANCE OF THE 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.

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

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.

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.

Bad 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.

Bad analysis produces bad conclusions

The growing reliance on computers to analyze vast amounts of data is potentially problematic.

> *I remember a situation when I was CFO of Continental Seafoods. We gave some well know fisheries resource scientists the opportunity to analyze our fishing statistics (catch -v- effort) for vessels we had operating in West Africa. They did their work, and eventually produced a preliminary report of their findings. They had had some difficulty coming up with a coherent analysis for some of the results from the Cote d'Ivoire, and proposed a complex explanation of the possible reason for the results.*
>
> *After discussion and some review it turned out that the underlying data included data for one of the vessels that had been used in a regional survey and not operating in the same way as all the other vessels in the fleet.*
>
> *The explanation was very simple, but nothing the computer on its own would ever have discovered.*

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 parallel dataflows so that data may be verified in an independent manner. Data should not only be right, but be seen to be right!

KEEPING DATAFLOW COSTS LOW

Multiple use of data

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

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 an individual 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.

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 MDIA 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 MDIA 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.

ABOUT DATAFLOWS

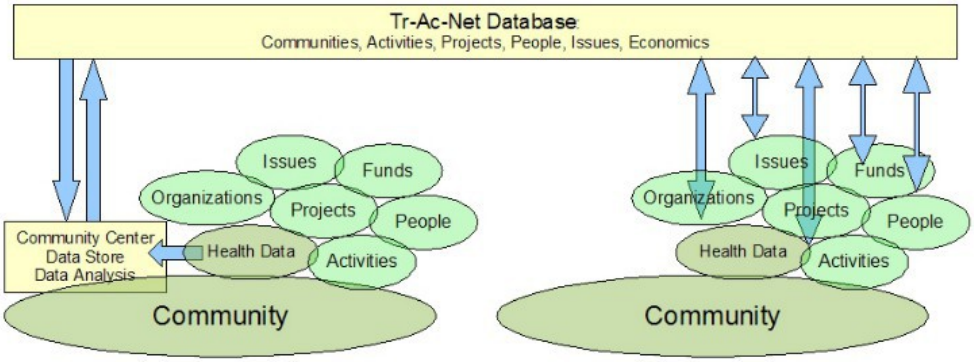
There are many issues with dataflows. The basics of dataflow do not change, but the technology to implement dataflow have changed in a major way over the past few years. A good system of metrics requires dataflow that are reliable, low cost and flexible enough to handle a wide variety of analytical situations.

DATAFLOWS

Progress is facilitated when there are data that describe the situation, what is being done, and what is being accomplished. The following graphic shows two approaches to collecting and handling data. In one case there is a local capacity for data store and data analysis ... in the other case the various data elements flow directly into a widely accessible database that functions over a broader area. In both cases the data flow into the widely accessible database for global analysis.

In both cases, simple data are collected and used to build the data foundation for analysis. The dataflows are organized so that there is feedback rapidly to where it is most needed for performance improvement and problem solving.

Local Dataflow



The most important use of data is use locally to improve something that is local and important.

Multiple use data flow

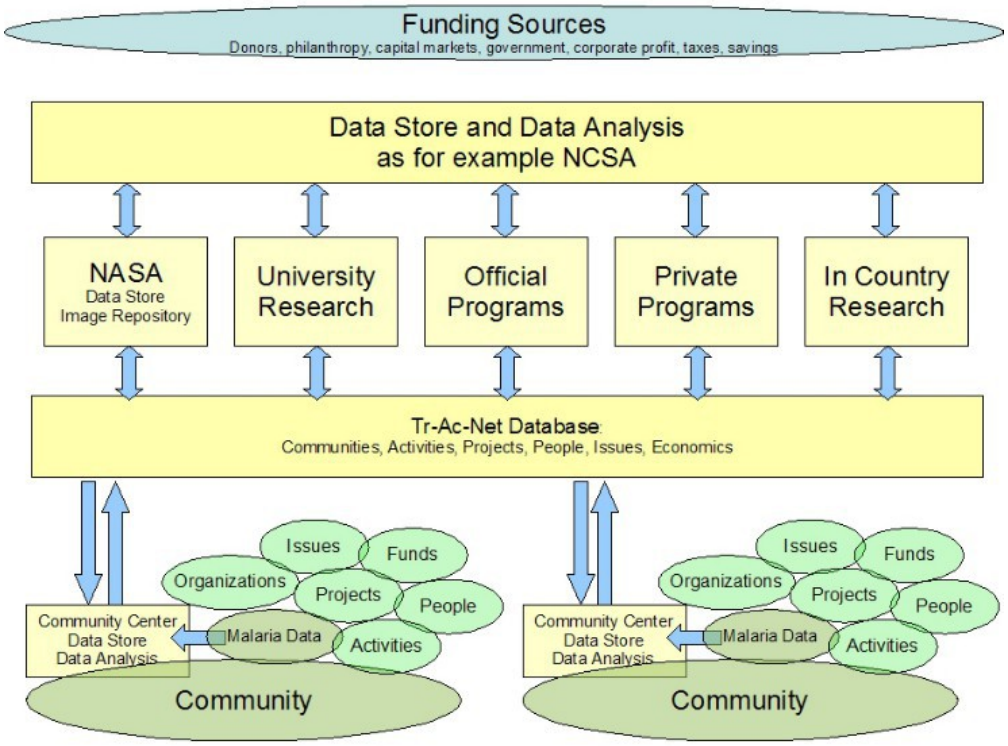
The following schematic shows how data originating in a community may be used many times: (1) for local community level analysis; (2) for cross community and cross country analysis using the Tr-Ac-Net database; (3) global analysis (as for example using the NCSA systems; and (4) a variety of research modalities at universities, in official organizations and in private centers.

The fall back system is for a piece of paper to move from a source location to a central place. But this can also be done using electronic means, including a mobile phone, an Internet message, floppy disks and CDs.

The key to use of technology is to ensure that the costs are low relative to the value of the data. Paper has been an effective way of recording and moving data, but modern electronic ways have the potential to to be many thousands times more cost effective.

The deployment of MDIA requires the collaboration of many to facilitate cost effective reliable movements of data to the MDIA datastore ... and central to this are organizations that have low cost access and use of the Internet.

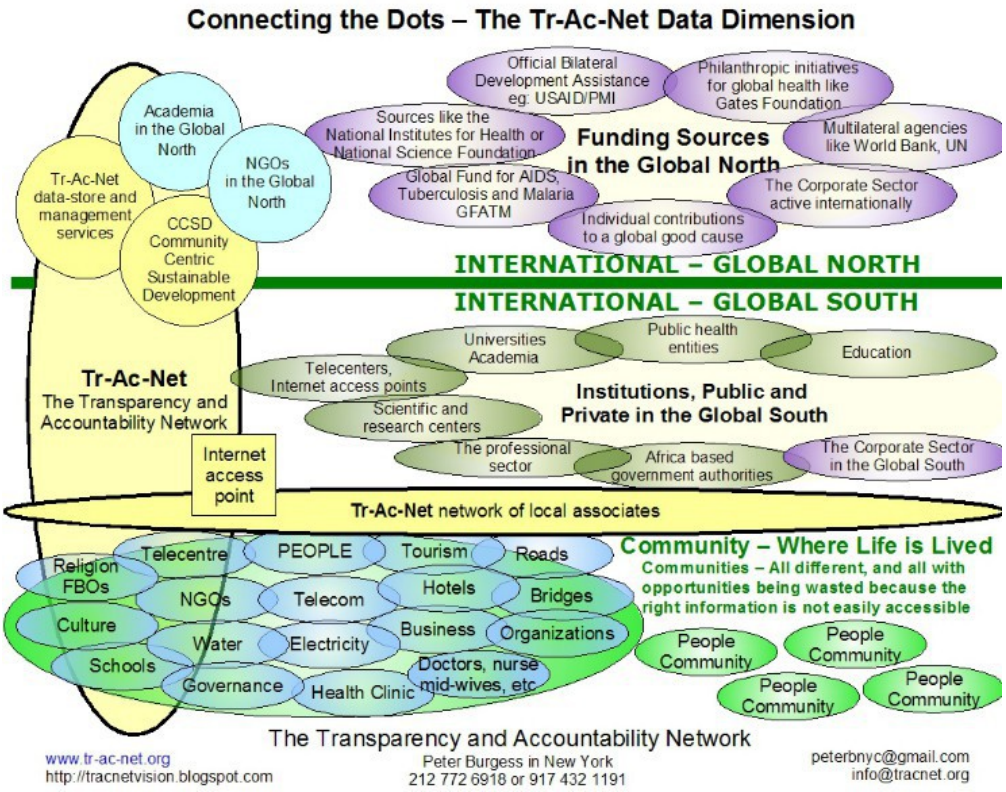
This is a variant of these same dataflows highlighting the role of surveillance and data collection for all aspects of the process so that these date may be used for local, area, international and global analysis.



Systemic dataflows

There is no systemic dataflow from community up ... and for all practical purposes the system of management in the relief and development industry has all the power of "pushing on a piece of string".

The following shows something of how dataflows were described by the Transparency and Accountability Network (Tr-Ac-Net) team. A similar dataflow architecture might serve as the catalyst for the widespread deployment of MDIA.



MDIA has the metrics to put all the dimensions of socio-economic progress "on the record". There needs to be a functional structure so that data may be collected and put into a system where the data can be used. With this, where results are good, there can be replication ... where the results are poor, changes can be made and the responsible organizations and people held to account. MDIA provides some of the essential checks and balances so that resources are not lost or wasted.

In order for MDIA to work, there has to be system management. Accordingly, this system needs to operate independent of the entities needing measurement. The basic framework provides for the following:

- Independence
- Reliability
- Objectivity
- Neutrality
- Low cost
- Timeliness

Dataflow architecture is important

The available technology to assist with dataflow has improved immensely, but care still needs to be used in order that costs do not get out of control.

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

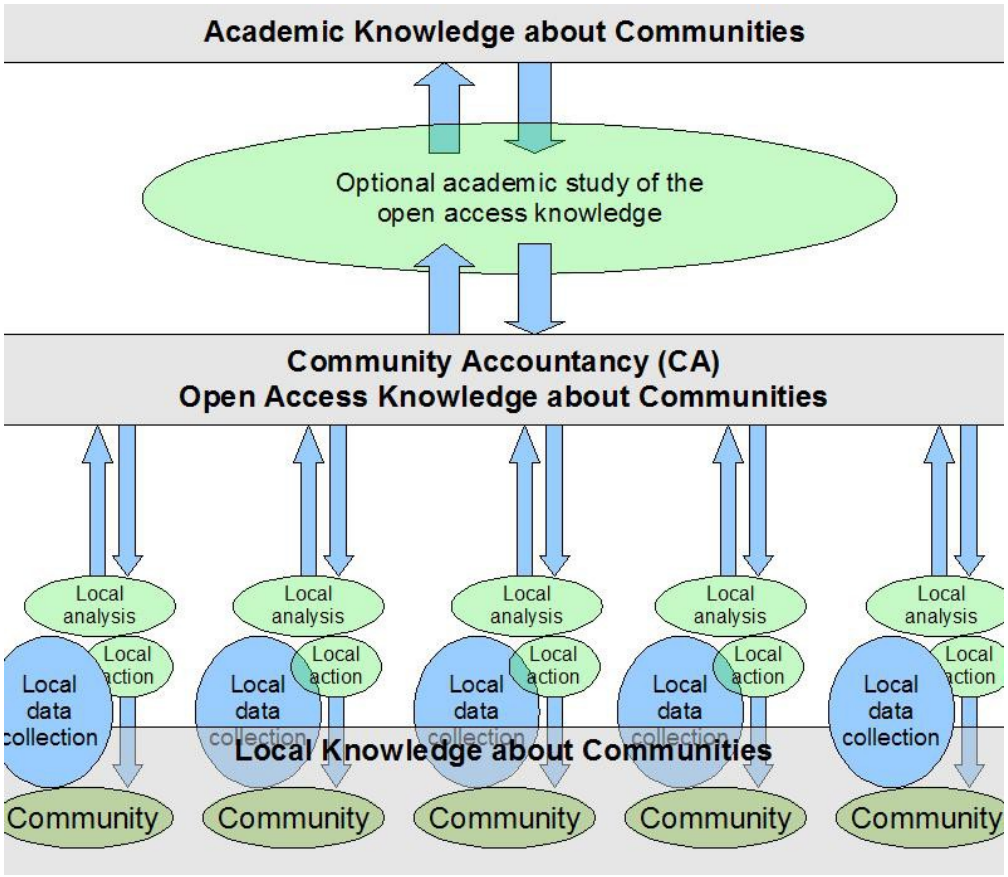
Local data may need some simple analysis to be useful for local decision making … but this should be quick and easy. If there is progress … good … if there is little or none then what was wrong with the analysis and what should be tried now.

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 MDIA, 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 work in around 2005 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.

Easy data … use what is already available

To make data acquisition efficient ... use what is already available!

Easy data are everywhere

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.

Some data are easy to acquire ... some more 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 MDIA 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.

TECHNOLOGY

Using Technology

The basic concepts behind the analysis and use of data have changed little for a long time ... but the technology to facilitate this has been improving rapidly for a long time. Technology has been driven by science that tracks according to Moore's Law ... the idea that the power doubles and the cost halves every 18 months ... and this has now been going on for at least 30 years! My shorthand for this is that today the power available for management information analysis is one million times greater than 50 years ago ... so how come performance in all areas of socio-economic activity is not tracking along a similar trajectory?

The cost of technology

The cost of technology is huge in terms of development costs and the capital cost of infrastructure ... but the cost of use, the incremental cost of use is almost zero. The cost of technology relative to the power of technology has improved exponentially for many cycles ... following Moore's Law there the cost reduces by half over 18 months while power doubles in the same time. It should be noted, however, that “behavior of cost” means that only technologies with huge mass appeal will every have a low unit cost for the user. In practical terms it means that only technologies that have use in a mass market can ever cost effective.

Data structures ... data architecture, data flows, etc should be designed so that they are are compatible with available technology being used in mass markets. Cost in this segment of the global economy is a key item to understand ... volume makes a big difference. Special purpose is expensive ... using an existing product or service in a new way requiring little or no modification is very very cost effective.

Mobile devices and infrastructure

The data acquisition process may now be optimized for use with low cost mobile devices. Specialized mobile data entry systems have been available for many years, but they have been expensive and suited only to well funded segments of the global economy ... not for healthcare in poor environments.

In conjunction with relational database logic, it is possible for a mobile devi9ce to send text messages that have critical data content using standard SMS protocols. Software such as FrontlineSMS facilitates transfer of these messages into a structured format in a database. This is a powerful application of low cost technology that can facilitate data acquisition from every community on the planet that are within range of mobile cell telephone infrastructure. At the present time (late 2009) even very remote rural communities have access to cell phone infrastructure.

Relational database

The relational database appeared on the technology scene in 1978 ... and it was said at the time, that this would change accountancy for ever. In some way this has become true ... the ideas of good accountancy were able to be integrated into a lot of management

information in very powerful ways ... and that has been very good ... but in the process the accountancy profession has strayed away from some of its core responsibilities, and reported numbers are now rarely what one would expect them to be!

In the context of IMM, the relational database makes it possible for a lot of meaning to be transmitted ... communicated ... in ways that are low cost and very clear. This is incredibly valuable, and should be exploited as much as possible.

The use of technological power to organize unorganized data is not a good way to go ... it is possible to do ... but it is suited more to an academic exercise that to practical management.

Internet and Web 2.0

The Internet has changed the world ... not just the world of information. It is, however, a challenge to use this so that there is speed and progress and not just more volume. The web is still evolving ... and its impact huge. What has already happened may well be modest compared to what is possible in the future.

History repeats itself

In about 1962, I attended one of the first public demonstrations of the laser. It was at the Royal Institution in London .. in the same room that Faraday had used to demonstrate electricity in the 19th century. A few years later ... 1967 I guess ... I was working in the USA and laser light decorations were fashionable ... but that was about it. A decade later laser beams started to be used for industrial and commercial purposes ... and eventually practically every check out system in the world uses lasers and bar code scanning ... and industrial processes use lasers for both measurement and for machining ... and the medical profession uses lasers for their precision work. The practical application of great technology takes time.

My take on the Internet and Web 2.0 is that a lot of what the public is doing with the technology is about where the laser was in 1967 ... imagine what can be done in the future.

Web accessible 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 continuing big role for on the ground mapping.

The following images have been obtained from freely accessible web sources. They are good and getting better ... but have important limitations.

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

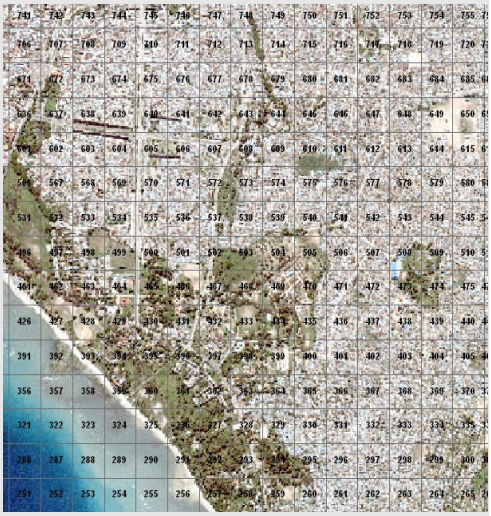


Image 3 is of Stone Town and its outskirts in Zanzibar. It is supplied by QuickBird and incorporates data from both the visible and the near-infra-red (NIR) spectrum. A grid based matrix has been overlaid.

With this technology it is possible to get images with a resolution of under 1 meter, a level of resolution that makes it possible to plan in detail without the expense of land mapping.

Supercomputing and data mining

The wall map and colored pins is a powerful way of planning ... it is low tech. and works very well for day to day decision making. Keeping track of how things change over time

is, however, a data intensive exercise that rapidly gets out of control. This is where technology comes in.

Using the same data that are used to update the daily wall map ... it is possible to update a database with every data element necessary for subsequent analysis and data mining.

A team of local staff in cooperation with international IMM experts makes it is possible for very cost effective data acquisition and analysis.

It is expected that these data will confirm that good knowledge about the spatial distribution of mosquitoes and the spatial distribution of malaria in the community makes it possible to plan effective interventions that can be very much lower in cost than blanket coverage and much more valuable in terms of results being achieved.

DATA ACQUISITION

Using existing data ... easy data

There is a huge amount of data that has been collected over the years ... but almost all is dramatically underutilized. In fact, in the relief and development industry, a very large proportion of the funds have been used for surveys and data collection, with rather little spent on doing what was most needed ... helping to fund practical activities.

Sixteen studies of the health sector

> *Why would anyone want to have sixteen studies of the health sector ... but this was the outcome when Namibia made health a priority for its first development plan after independence and sixteen difference donors made doing a health sector needs assessment study a pre-condition to funding anything else.*
>
> *If there was no data, that would be one thing ... but three major studies had been prepared within the previous 12 months ... by Germany, by the UN system and by Namibian professionals ... all of which were available and clear about what needed to be funded.*

Data collection and surveys are popular with donors because they are also popular with international consultants and NGOs. But sadly, these expenditures add to cost without doing very much for results.

There is a huge amount of old data ... and there is the potential to use these data as a starting point for better data about development. Mobilizing these data is a challenge ... and potentially very valuable. New data might well cost $20,000, yet similar existing data may well already exist, and could be retrieved for a small fraction of the cost of getting new data.

But while the cost argument appears strong, there is little effort evident indicating a movement to use of existing data. The reasons for this appear to be governmental concerns about sharing official data, and corporate and academic concerns about sharing intellectual property that might possible have the potential to be monetized for profit.

Data collection

In a corporate setting, data collection is done throughout the organization, and recorded in a systematic way. For MDIA data collection has to be done throughout society, and also recorded in a systematic way. Data collection can be done by anyone and everyone.

If you know something, MDIA provides a way for this information to be used as a part of the body of data that are needed. This is addressed in the section on functional structure.

Journals and day books

There is a reason why “journals” and “day books” are the basic books of original entry in old fashioned accountancy. Every transaction is written down every day. Pre-computer

accounting used day books and journals to record financial transactions. This started the process of accumulating the information. After compiling information in a daily record, the information was then "posted" to accounts where the data starts to have analytical meaning. In a computerized world, the process is now electronic, but the concepts of organization do not change.

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.

Making data accurate

The accuracy of data is critical. If the data are valid and respected, the data have power. Data may be seen to be valid when the same view of facts appears using data from different sources. The functional structure described in this paper addresses the question of how different dataflows will provide confirming validation. Data validation takes place in many different ways. In a good system, it is almost impossible to fool the oversight team because the data are being looked at and validated from many different independent perspectives.

Getting control over the data

Accounting has value because the data flowing through an accounting system are generally reliable. The data are reliable because they are organized and under control from very early on. Because of this they can be checked, and errors identified. In an accounting system all the data that are needed are recorded ... and registered.

In the design of an accounting system there are processes that ensure the accuracy and reliability of the data. These include the ideas of:

- Internal check ... that ensures the data collection process is functioning in the intended manner;
- Internal control ...that requires data to be processed in the prescribed manner; and,
- Audit ... that checks the way the process is working, using either internal audit staff or independent professional auditors

There are also checks that are associated with expectations of what the data should be like. It will be very rare for the crooks to know all of the validations that are going on. Some of the validations include:

- Is this what was expected? If not, why not?
- How does this compare with the past?
- How does this compare with some other location?
- How does this compare with some other organization?
- How do cost compare with value realized?

- How do costs compare with budget?
- Etc.

These questions are part of and integral with the data collection piece of the system. Everything gets checked and controlled so that only good and valid data are used. In the MDIA system there is a need to validate the information being reported as well. This is done by encouraging multiple data flows that verify the underlying facts being recorded.

Understanding getting missed in search for money profit

For many years tax attorneys and accountants have encouraged tax saving strategies based on the provisions of tax depreciation laws and regulations. Many of these achieved a short term tax reductions goal ... but in the end the investment was lost. Simply put ... there was a modest tax saving, and a considerable investment loss. Fast talk and fees drove the marketing of these vehicles ... but there was nothing to clean up the mess and make the players accountable.

And cost accounting can be expensive ... with it being much less costly simply to have management and supervision that have some appreciation of cost control and their role in optimizing costs.

Management by Walking Around - I

Eyes are a very powerful management tool. They provide a good link between reality and the numbers. For years accountancy students were taught that an auditor had a responsibility to "see" the inventory as part of the audit routine since it is very difficult to have a very big fictitious inventory and not be able to show something to the auditors.

But I use walking around as a way to see things that do not find direct expression in the numbers and reports ... working conditions ... factory noise ... happiness levels ... excess inventory ... obsolete ... factory effluent ... scrap ... workflows ... excess staffing or under staffing ... etc. etc.

Management by Walking Around - II

I used to reckon that after walking around a factory or construction site I would be able to identify hundreds of thousands of dollars worth of performance improvement. Part of this was because I saw things myself ... but part was because the department managers knew things that that they would share with me informally. Simply by walking around, a whole lot of sharing became possible. Front line managers know a lot, and rather little of it can get put to use simply by relying on formal channels.

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.

DATA ORGANIZATION

ORGANIZING DATA

Analytical codes are a basis for organizing data

Codes facilitate the organizing of data. The power of relational analysis is maximized by the design of the analytical codes. This is the key to easy analysis, and relatively easy to do for a relational database. Frequently, however, it is ignored and code designs do not follow fully logical rules and easy analysis then becomes impossible.

Account codes

Part of the power of conventional accountancy was the logic of the account codes ... and this will become even more important as a uniform framework for socio-economic performance metrics and breakthrough accountancy emerges.

Budget codes

In government settings budget codes are the codes that control government moneys more than anything else. Many countries use a "single treasury account" financial control framework with all government disbursements controlled by a "vote" of the legislative body. EXPAND

Program codes … Organization codes … etc.

The power of IT for processing data is optimized by a strong code system that allows for easy aggregation of transaction data and easy drill-down from summarized data. EXPAND

Place and time analysis

Place and time analysis are important in the use of TVM … and for easy analysis there must be rigorous systems for coding of place and time.

Analysis independent of permissions

TVM does value analysis independent of any permission … the more permission is refused or there are constraints on dataflow, the more it is imperative that value analysis is done and conclusions drawn. The more there is "push back" the more there is a need for the data to be obtained and for the analysis to be done and reports available.

While there are strong laws and rules that require organizations to publish financial data … the way these data are published limits what it is possible to learn from the material rather than being a regime where data about performance are clear and operations transparent. There are good … that is bad … reasons for keeping operational data private! Many business organizations cut corners and private "deals" are going on all the time. These "deals" make the participants a lot of money and are only possible as long as the financial reporting remains opaque.

This is an old idea … that works

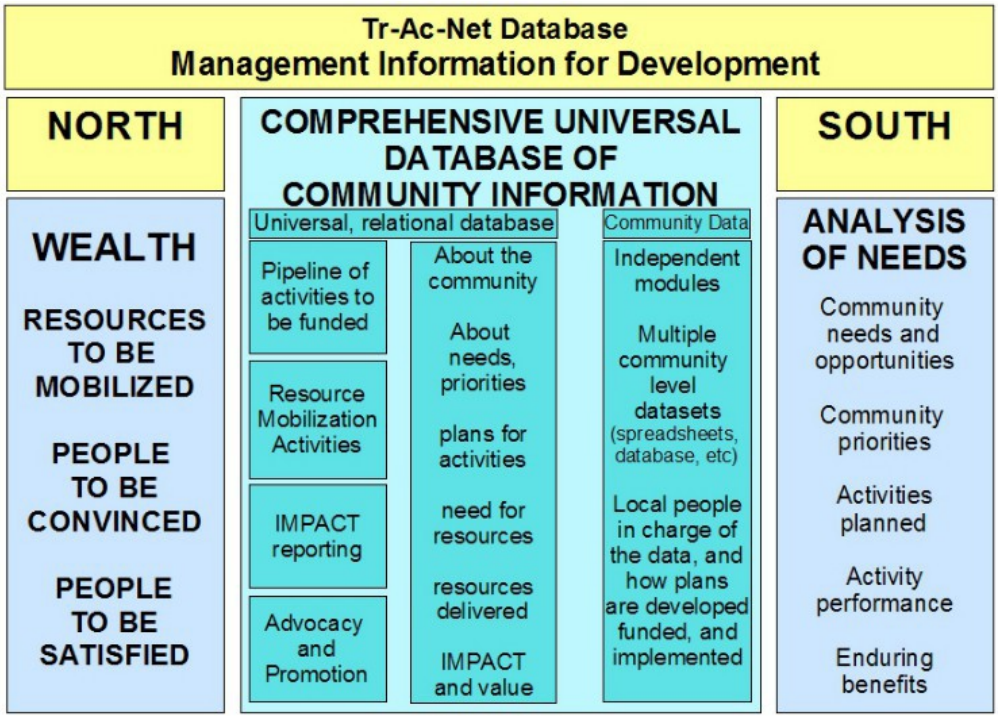
If the CFO considers everyone to be a crook … and designs the accounting system so that it is difficult for a crook to steal the company's assets … then the accounting system will control the company's assets. Experience suggests that crooks are everywhere … but most are lazy … so they don't bother with an accounting system that is hard to compromise. Change the internal control system from time to time to keep from making it easy!

Organizations like the World Bank have diminished the role of financial processionals in keeping track of the money … accordingly it is no surprise to have extremely weak financial controls in almost all areas of the relief and development sector, including in projects that are funded by development banks and international donors. These fund flows have been treated like open access ATM machines, and the fact of slow progress in the relief and development arena is not at all surprising.

Changing this is not going to be done “with permission” … it is going to get done because it is right, and the public is entitled to accountability for the use of resources and the outcomes.

DATA STORE

For organizational accounting all the financial transactions are accumulated in accounts and the storage is usually in a relational database controlled by the organization. Something different is needed to satisfy the analysis essential for MDIA.



For MDIA, the financial and socio-economic transactions are accumulated in an organized manner like accounts and stored in relational database ... but not only numbers, but also nonnumerical facts of importance.

Management information for development ...

- The first step is getting the data ...
- The second step is getting the data organized and into a data store where it can easily be accessed ...

The north has wealth ... and the resources to be enormously helpful.

The south has needs that are urgent.

Management information is the missing element that is needed to bring the north and the south together for global benefit.

DATA ACCESS

Easy open access

Collecting data is expensive ... and data only have value when they are used. My experience suggests that much data that are collected are used once, and once only, especially the data collected by sub-contractors in the international development space and students doing research in the academic space.

As in other areas of socio-economic analysis there is a value chain challenge associated with data ... data are known to be valuable and therefore there is competition around the individual or organization that is going to accrue the benefit from the data.

It's my data!

The academic community embraces data as a way to enhance academic reputation ... obtain advanced degrees ... build institutional capability ... But all of this is at the expense of the potential value of the data to society as a whole. The opportunity costs ... or lost opportunity value of this academic behavior is huge. Sadly there are few in the academic world who have given this issue very much attention even though it is critical matter in the performance of socio-economic development.

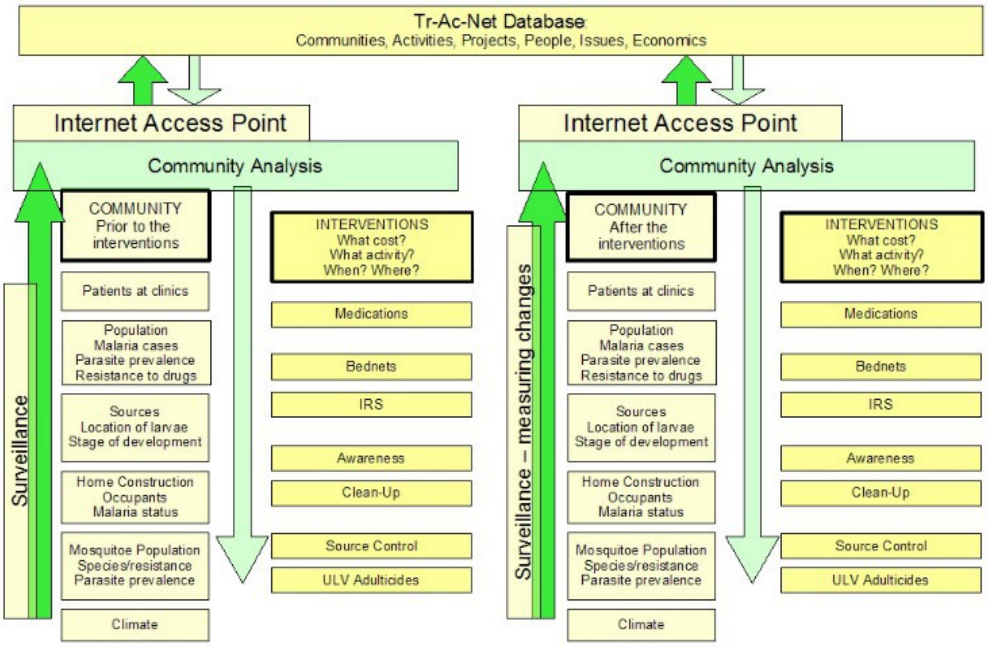
There has been a disturbing trends over the last few decades where researchers often paid for by government money take ownership of research data in order to game the system and improve the individual's career.

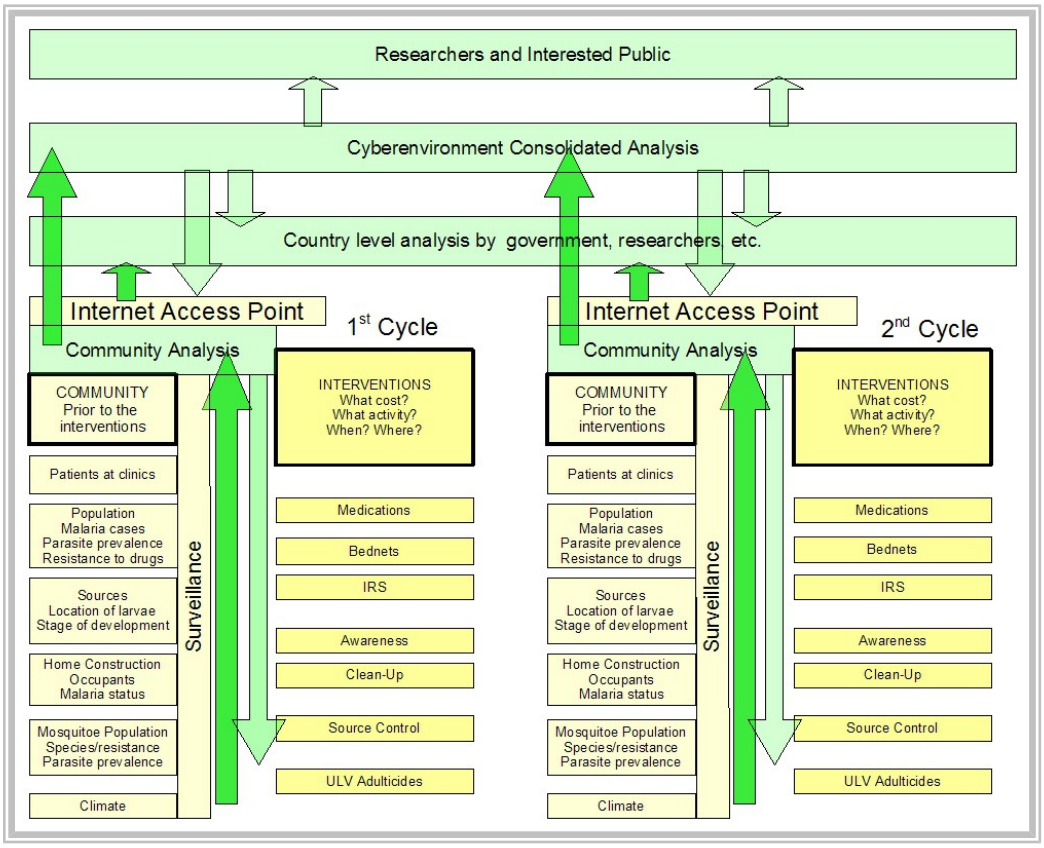
Intellectual property

Research and development (R&D) that results in breakthrough knowledge that can save lives and reduce disease is wonderful and should be encouraged ... but what is the best way to provide incentive ... what is the best way to allocate resources to R&D and to the deployment of new therapies.

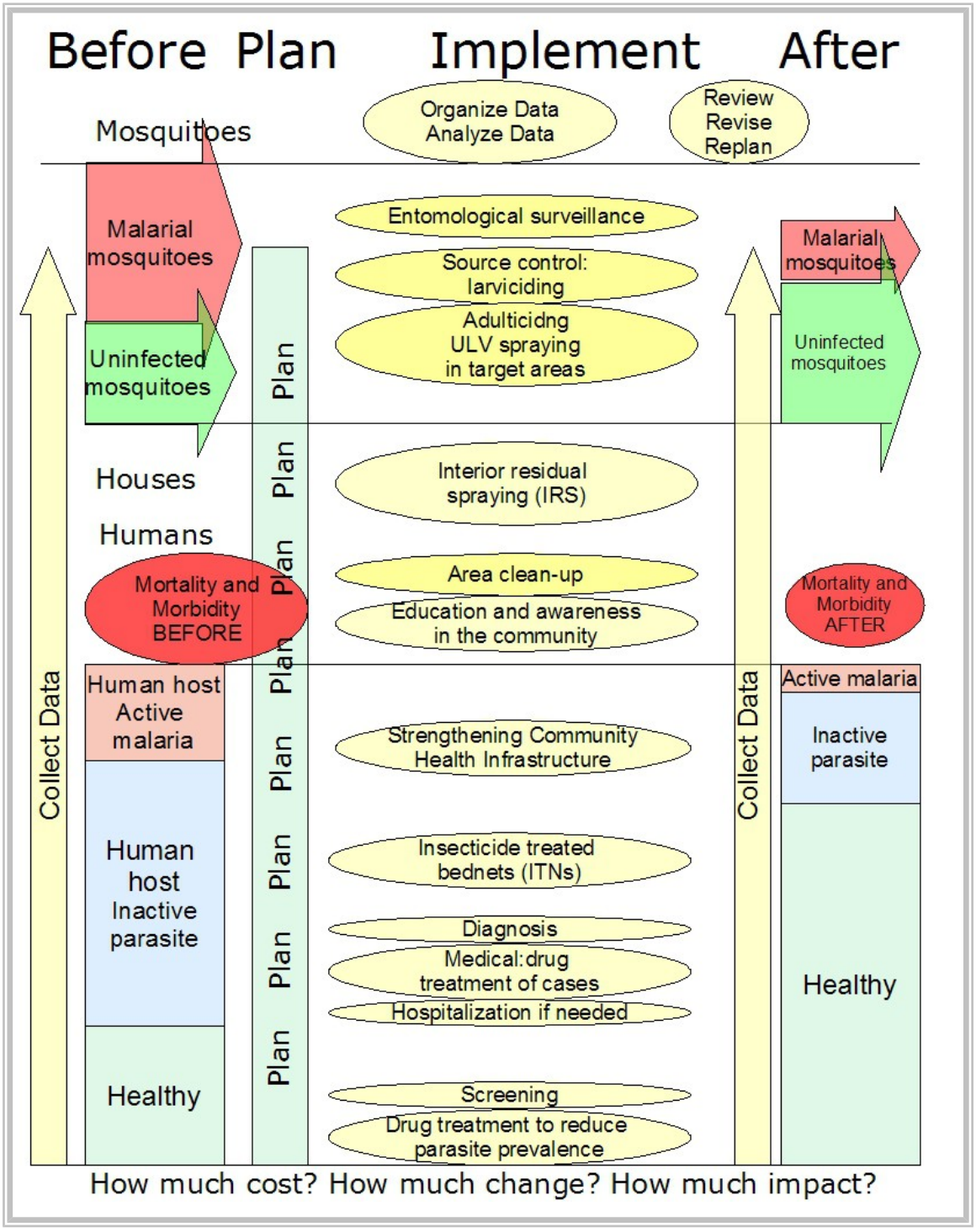
What has evolved over the past several decades is a chaotic system where the biggest driver of decision making is profit potential and the outcome of investment determined excessively by those that control the system. There is little or no weight given to social value arising from any specific course of action ... as evidenced by the "orphan drug" syndrome where good science lies dormant because there are life saving therapies that are unprofitable albeit cost effective.

Metrics for malaria control





Integrated Malaria Management



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