MULTI DIMENSION IMPACT ACCOUNTING (MDIA)

Draft dialog for Left Forum panel

SECTION 1

Rough notes from discussion … Friday, May 16, 2014

Joe Mondello	John Kiehl	Peter Burgess
Environment	Staying on point Corporate America	
Multiplier Wave propagation Concentric circles	Tool – relevant numbers	
Carbon … Greenhouse Gases CO2 Methane	Misbehavior of corporations Red-Black Ink on a spreadsheet Pink / Green Blue Another dimension	
Cheap tires - v - Michelin tires	Relevant numbers for everything that matters	
	Crowdsourcing to build database of standard values for everything that matters	
	What does matter?	
	The issue of SIZE … size does matter. Big size is dangerous No company should ever have more than 30,000 employees! A restaurant that is always full is going to be successful … the	

	owner has 'skin in the game' Oldsmobile … 100s of car companies before they consolidated	
	The matter of RISK Risk must be accounted for	Ignition switch story … small decision to save money resulted in huge cost to the company. How? Why?
		Fracking industry is another example of risk. Much fracking done by small companies that do not have the financial resources to handle an accident.
		Insurance is part of the answer
		Environmental Defense Fund (EDF) … Krupp indicated there are 6,000 small companies doing fracking.
	Punctuated equilibrium	
	Legislation doesn't work … something else is needed. Numbers is a better way.	
	Fitness landscape	

SECTION 2

This section are notes that aimed to define where I want to get to by the end of the panel discussion.

END POINT

MDIA has an architecture for socio-economic data that allows the same dataset to be used for everything of importance.

A. About the business / organization / economic activity … about PROFIT

Something the CFO understands
Something that the Board of Directors and stockholders understand
Something that operating department managers understand.
The money profit balance sheet and profit and loss accounts
The people impact account
The resource depletion account
The environmental degradation account
The risk account

B. About the place / community

An inventory of good things
An inventory of bad things
A tabulation of what could be improved
A summary of how good a place it is to live in
A summary of how good a place it is to visit.
Payroll / livelihood accounting
People quality of life status
People quality of life services account for the place
Resource account summary for the place
Environmental degradation summary for the place

C. About the person

Perspective
- The perspective of an individual
- The perspective of a family
- The perspective of a community
- The perspective of a nation
- The perspective of the world

What is the quality of life and standard of living
- This is made up of many different elements.
  - Wealth;
  - Job, Income, Livelihood;
  - Health;
  - Education;
  - Housing;
  - Community;
  - Food and water;
  - Energy;

Communications;

The elements interact with each other in complex ways and depend to a large extent on the individual, but are also modified by all the other elements.

The 'State' of a person is a function of what has happened in the past, what is going on in the present, and what can happen in the future.

The 'State' of a person is also comprised of both money valued elements, and elements that are valued without reference to money. 'Good' is not valued with reference to money, but it must, nevertheless be quantified.

D. About a product

The word 'product' is used to mean both goods and services

Data about a product:
- Identification
- What it is

Money metrics
- How much it cost (money metric)
- How much is the price (money metric)

The trucost / truvalue profile
- Material
- Energy
- Labor
- Equipment
- Financial
- Taxation
- Pro-good expenditure
- Profit
- TOTAL

In a given situation, what is the VALUE of the product

E. About the planet

Reconciliation / aggregation for the planet

For resource depletion

For environmental degradation

Resource depletion includes:
- Minerals
- Energy
- Land
- Water

Environmental degradation includes:
- Land
- Water
- Air
- Bio-diversity

SECTION 3

This section are more notes about a possible dialog for the Left Forum panel discussion.

End point: Where are we going?

Why the name … Multi Dimension Impact Accounting?

Taking this backwards …

Accounting

not economics
not impressions or opinions
something more rigorous … data about facts

Impact

not only accounting for money and profit
but also accounting for
impact on people
impact on planet

Multi Dimension and multi-perspective

while there are only one set of facts, the data architecture must permit multiple view of the data / facts because they do not always look the same from different perspectives

Exhibit … John's cube

Why is MDIA needed? Why are better metrics so important?

You manage what you measure

It is 50 years of so since the mainstream corporate world started to 'manage by the numbers'.

> *Harold Geneen, the CEO of ITT was an early proponent of this. In the 1970s he transformed ITT from a low performing sleepy international telephone company to a huge, high growth, high return on investment international conglomerate. It was all numbers and financial engineering.*

Wharton, Harvard Business School, MIT Sloan, Dartmouth Tuck and the rest have taught many generations of students to be financial 'quants' …

Optimizing for profit has proved to be fantastically good for corporate performance

As technology has emerged the business model has been to use the resulting productivity to improve profit performance and stockholder value … but EXTERNALITIES have been ignored.

People … payroll has been optimized for the profit performance of the organization and not optimized to improve the quality of life and standard of living of people.

Planet … corporate profit performance has been optimized with little or no regard to the impact on resource depletion and environmental degradation.

Surely there is nothing new in this?

Yes and no!

There was NO conversation about the Triple Bottom Line … Profit, People, and Planet 40 years ago, but slowly these issues have crept into the conversation.

Remember we are talking about complex systems where there are multiple components of society and the economy interacting in very chaotic ways.

One of the good chaotic things is that technology is improving at an amazing pace, and we have no idea what will emerge next.

In IT there is the phenomenon on Moore's Law

Similar things are going on in bio-technology, materials, etc

But the conversation is getting more robust … from 10 years ago, to 5 years ago to now

The problem is that this is conversation … with relatively little traction

In order to move the conversation and the good ideas to action there has to be 'numbers'.

Numbers?

Yes

But how can you put numbers on things that are not expressed in money terms? These things are subjective.

This is not easy … but it can be done and must be done.

In corporate accounting there is a subset of accounting called cost accounting. Within cost accounting there is the concept of 'standard costs' which makes cost accounting a whole loot easier to manage without losing much of its value. I will argue that standard costs actually makes for better analysis and better decisions.

In MDIA … we use a similar idea. It is 'standard value'.

Everything … EVERYTHING gets a standard value!

But that is an enormous undertaking? This sounds like a lot of data … a lot of work … but is there anything of value at the end of the day

It is a lot of work … but if the data architecture is right, there can be utility way before there are standard values for everything.

Better yet, the process of developing standard values helps in achieving better socio-economic performance.

Let's start with the things of importance around people, quality of life and standard of living

EXPAND

In the case of planet … resource depletion and environmental degradation

EXPAND

In the case of product … the goods and services we buy

EXPAND

In the case of an organization … the money profit trajectory already converts in a 'stock market value'. With MDIA a truvalue is determined taking into account the organization's impact on people and planet

EXPAND

So what does this mean in a practical way? How does this get used?

The purpose of all of this is to get behavior change so that socio-economic activity results in people having a better quality of life and standard of living with little or no resource depletion and degradation of the environment.

Behavior change is people centric. People make decisions and people have to be enabled to make good decisions that result in good outcomes.

My experience in doing this suggests that behavior change can be very very rapid when the data are relevant to the reality of the situation

When you change the way the game is scored you change the way the game is played

> *As a C-Level executive I had a P&L responsibility. I needed results to show profit improvement*
>
> *My shipping department supervisor had a responsibility for operating the shipping department including a fleet of trucks in support of everyone else as efficiently as possible. Data showed he could drive the trucks more than 70,000 miles on a set of Michelin tires, but only 30,000 miles on lower cost (to buy) tires. If the purchasing department made the decision, we got cheep tires and lower profits. If we used the data correctly we got higher profits.*

Numbers only serve to confuse

Badly architected numbers certainly serve to confuse, but if the data architecture is right numbers can be used usefully, reliably and efficiently.

The data must be agnostic relative to the process

The basic goal is to have good results … it matters less what process has been used to get to the results.

This is not the same as saying that 'the end justifies the means' … what is says is that we do not decide how to measure based on the process being used, we decide what a good outcome will look like and we measure for that.

SECTION 4

TrueValueMetrics

Multi Dimension Impact Accounting

Why are we here? What is TrueValueMetrics? What is Multi Dimension Impact Accounting?

The water bottle

How many people have a bottle of water with them? What do you know about your bottle of water?

You probably paid one dollar ($1) for the bottle of water. Maybe less if you bought the bottles in bulk, maybe more if you bought a fancy up-scale brand!

The growth of the bottled water industry over the past two decades has been impressive … that is if you think growth is good. It is profitable … otherwise the big brand marketing companies would not have got into the business and put their marketing muscle into promoting it.

You know the idea of cost, price and value. We can come back to this later …

$1 is the retail price

There is a retail margin. If this is 30%, 30 cents of margin.

The cost at the retail stage is 70 cents

In the supply chain, there is warehousing costs and distribution transport.

Let's say 10 cents for warehousing

Let's say 10 cents for distribution transport

Before this there is sourcing the water, sourcing the bottles and putting these together and then putting them into some sort of distribution package.

Let's say 10 cents for water

Let's say 10 cents for bottle

Let's say 10 cents for distribution packaging

Let's say 10 cents for advertising and admin

Leaving 10 cents for profit

All of these numbers are money accounting numbers … the numbers you will find in a company's conventional accounting system and their cost accounting and management information systems.

A glass of water from the tap has a very different cost structure. Most people pay something like a flat rate to have water piped to one's residence.

The infrastructure exists, whether or not it is being used to fill a glass of water.

The operating costs of the water infrastructure are low relative to the individual glass of water.

We can go into more detail about the piped water infrastructure … but the basic conclusion is that the cost of this water is very near zero.

So why on earth do we pay a $1 for something we can have for almost zero.

One reason is advertising and PR … also peer pressure. Everyone has their bottle of water … and a $1 is not a meaningful amount of money … and it is convenient … and … and … and

But what about the real cost of the bottle of water … what about the TruCost of a bottle of water.

We are increasingly getting into a situation where there is a shortage of water

In the standard value framework a liter of water has a standard value of 10 units

But according to the literature it takes 3 or 4 liters of water to make a one liter bottle of water …

so thinking of water alone, the standard trucost is (say) 300

Your small bottle of water is likely to be 500 ml (milliliters) or half a liter … so a trucost just in terms of water of 150.

But what about the bottle. The bottle is probably made out of PET plastic. Polyethylene terephthalate (PET) is safe plastic used for beverage containers.

PET is made from petroleum

It is reported that some 17 million barrels of oil are needed to make 30 billion plastic bottle. A barrel of crude oil is 42 gallons and produces a little more than this of product output after refining.

Oil has multiple environmental impacts: (1) resource depletion; and (2) environmental degradation.

In typical conventional money profit accounting there is no accounting for resource depletion. In MDIA, the standard value assigned for crude oil resource depletion is 100 units per barrel of crude oil

Similarly there is no accounting for the impact of environmental degradation.

When carbon based fuels are burned, 1 kg of carbon becomes 3.6 kg of CO2. Put in another way: 20 pounds of CO2e are associated with 1 US gallon of gas. Rough approximation … 1 ton of CO2e is produced when 110 US gallons of gas are used.

> *A Methodology For Offsetting Aviation Emissions by Dr Christian N. Jardine, page 6*
>
> *The greenhouse gas emissions will alter the atmospheric concentration, which in turn alters the energy balance of the atmosphere (known as radiative forcing). The radiative forcing is the driving force behind climate change, but because the atmosphere is a complex system, the effects of radiative forcing on the climate are not linear. Furthermore, there are many measures of climate change including effects on temperature, rainfall, average wind-speed and sea level rise. These changes in climate have impacts on society including agriculture, land use, energy consumption. Ultimately, these societal changes can be quantified in terms of financial impacts.*

> *Ten Billion, Stephen Emmott, page 84*
>
> *'And – irony of ironies – it takes something like four liters of water to produce a one liter plastic bottle of water. In 2011 Americans consumed per capita 222 bottles of water, that's approximately 70 billion bottles of water in a year for the whole country.'*

Bottled Water and Energy Fact Sheet

The growing consumption of bottled water raises questions about the product's economic and environmental costs. Among the most significant concerns are the resources required to produce the plastic bottles and to deliver filled bottles to consumers, including both energy and water.

The Pacific Institute estimates that in 2006:

> *Producing the bottles for American consumption required the equivalent of more than 17 million barrels of oil, not including the energy for transportation*
>
> *Bottling water produced more than 2.5 million tons of carbon dioxide*
>
> *It took 3 liters of water to produce 1 liter of bottled water*

Total U.S. Consumption of Bottled Water in 2006

According to the Beverage Marketing Corporation, Americans bought a total of 31.2 billion liters of water in 2006, sold in bottles ranging from the 8-ounce aquapods popular in school lunches to the multi-gallon bottles found in family refrigerators and office water coolers. Most of this water was sold in polyethylene terephthalate (PET) bottles, requiring nearly 900,000 tons of the plastic. PET is produced from fossil fuels – typically natural gas and petroleum.

Energy Required to Make PET Plastic

According to the plastics manufacturing industry, it takes around 3.4 megajoules of energy to make a typical one-liter plastic bottle, cap, and packaging. Making enough plastic to bottle 31.2 billion liters of water required more than 106 billion megajoules of energy. Because a barrel of oil contains around 6 thousand megajoules, the Pacific Institute estimates that the equivalent of more than 17 million barrels of oil were needed to produce these plastic bottles.

Carbon Dioxide Emissions from Consumption of Bottled Water

The manufacture of every ton of PET produces around 3 tons of carbon dioxide (CO2). Bottling water thus created more than 2.5 million tons of CO2 in 2006.

Water Required to Make Bottled Water

In addition to the water sold in plastic bottles, the Pacific Institute estimates that twice as much water is used in the production process. Thus, every liter sold represents three liters of water.

Transporting and Recycling Bottled Water

More energy is needed to fill the bottles with water at the factory, move it by truck, train, ship, or air freight to the user, cool it in grocery stores or home refrigerators, and recover, recycle, or throw away the empty bottles. The Pacific Institute estimates that the total amount of energy embedded in our use of bottled water can be as high as the equivalent of filling a plastic bottle one quarter full with oil.

For the details on the calculations for "Getting to 17 Million Barrels," click here.

Sources:

Beverage Marketing Corporation estimate for 2006.

Plastics Europe. http://lca.plasticseurope.org/petb5.htm

I. Bousted. 2005. Eco-profiles of the European Plastics Industry: Polyethylene Terephthalate (PET), (Bottle grade).

Understanding measures

A 'Section' is 1 mile by 1 mile

There are 640 acres in a section or 260 hectares

A 'Hectare' is 100 meters by 100 meters or 10,000 square meters

There are 100 hectares in an area of 1 km by 1 km

Quantification

The standard measures being used in MDIA have been assigned in an arbitrary but common sense manner.

All of the assigned standards will be revised based on a 'crowdsourcing' process.

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