



# **MULTI DIMENSION IMPACT ACCOUNTING (MDIA)**

## **AN INTRODUCTION**

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## **ABSTRACT**

This paper introduces Multi Dimension Impact Accounting (MDIA), a system that is better than the prevailing financial accounting metrics that are used to account for and report profit performance, as well the many CSR and sustainability reporting initiatives that have been introduced over the past few years.

MDIA combines the accounting for money profit with rigorous metrics about impact on people and planet. Many of MDIA's money profit accounting principles are identical to prevailing accounting concepts but applied differently. For example, instead of the singular focus on the performance of an organization, there are multiple reporting boundaries so that there can be accounting and reporting about place and product as well as the organization.

With MDIA, analysis about impact on people and planet uses a system of value quantification that is based on 'standard values' similar to how standard costs are used in 'cost accounting'. This enables the accounting for impact on people and planet at the same time as there is accounting for profit.

The paper identifies the main issues with the prevailing metrics, and suggests how the metrics and reporting should be modernized. In MDIA, an economic activity located in a place is the focal point for data about money flows and profit, impact on people, and impact on planet.

Performance of organizations and places are developed by a system of aggregation or consolidation. The same may be done for products as they flow from one economic activity to another through the supply chain, their use, and into the waste chain.

Progress is determined by change in 'state', primarily in the place. State is like a balance sheet in financial accounting except that it is built up of 'value' elements rather than money denominated elements

The paper has a focus on the impact of economic activity on people, recognizing that the end result should be better quality of life for ALL people and reduced stress on the planet.

## NOTE

In the following, 'product' refers to either or both of goods and services.

## Introduction

### **Widespread dissatisfaction with the dysfunction of society**

There have been many times in history when there has been widespread dissatisfaction with the dysfunction of society. In most of history the opportunity to solve the problems was relatively limited. At this time the opportunity to solve really big problems is huge, but leadership does not seem to 'get it' and seems stuck in ways of thinking that are out of sync with what is now possible.

I am encouraged by the fact that science and technology have progressed amazingly in the past 50 years, and that so much of what used to be science fiction is now fact.

I am encouraged by the fact that there are more young people around the world with education than at any time in history.

These two facts should mean that our global society has more potential for peace and prosperity than at any time in human history.

But this is not the way our global society functions. There is a huge divergence between what is possible and what is being accomplished.

If we continue to go down the present trajectory of increasing socio-economic dysfunction and no possible solution in sight, it is entirely possible that we could be faced with a repeat of history along the lines of France in the 1790s or Russia in 1917. Whether this will be in one or two isolated places, or much broader in scope is an open question.

There is a massive amount of dialog about the dysfunction of society, how the 1% have become more and more wealthy while the 99% have seen their standard of living going down. There is concern in some places that the world still has too many people in abject poverty and hungry.

Even though there is concern that governments are taxing too much and not delivering on their responsibilities, and concern that corporations use loopholes in the law to do things that are 'just not right', yet there are few concrete ideas for systemic reform.

I argue that the way organizations optimize for performance is inappropriate for the 21st century because there have been some fundamental changes in the behaviors of the economy and society that have taken place in the last 50 years. I argue that this process has to be changed, and that the best way to change this is to have radical reform of the metrics being used for management and about society in the media.

Multi Dimension Impact Accounting (MDIA) is a practical way to change the metrics, and by changing the 'way we score the game. We can change the way the game is played'.

## **Prevailing Metrics Are Inadequate**

### **Inadequate systems of metrics**

#### **Single focus on three metrics**

The dominant conversation about modern society and the economy has a singular focus on three metrics for success. These are the 'terrible trio': (1) money profit for the business; (2) capital market prices for investors; and, (3) GDP growth for policy makers.

If there is going to be a successful 'market based' economy, there have to be metrics that deliver the right signals to decision makers. The growing asymmetry of information in almost all markets over the past five decades has enabled decisions that have pushed society and the global economy in a dangerous direction. The metrics encourage maximizing profit, minimizing payroll and ignoring everything that impacts the sustainability of the planet.

There is a huge amount of data to optimize profit performance within the corporate organization and in the hands of product advertisers and brand PR teams.

In contrast there is only a tiny amount of information that has a focus on bettering society and the state of the planet. Maybe the ratio is 99:1, maybe it is even worse.

#### **Anecdotal material**

Over the last few years there has been rapid growth in anecdotal material about many aspects of the global society. This is interesting material, but it is difficult to use in a way that will substantially change policy behavior as part of a coherent ongoing process. There are no metrics that address ALL the issues of modern society in a rigorous and coherent manner.

Meanwhile all the numbers in the present system encourage GDP growth, money profit and capital market wealth, without taking into consideration impact on people and planet.

#### **Accounting is more than 400 years old**

Metrics about corporate performance in terms of profit and the return on financial investment are based on an accounting system that was developed more than 400 years ago. It has stood the test of time, and is very powerful. It works well for money based accounting and reporting on profit performance, but there have been no significant enhancements to enable it for Triple Bottom Line (TBL) analysis of non-money impact on people and planet. This is what MDIA will accomplish, while maintaining the important strengths of the old double entry framework.

#### **A different sort of market long gone**

Laissez faire market economics goes back to the 1700s. Adam Smith published his famous book Wealth of Nations in 1776. Adam Smith died some years later in the same year that Watt patented the rotary motion steam engine, a key invention at that start of the industrial revolution. Much of the thinking about markets still uses the Adam Smith ideas even though the economy and society have changed. There has been an enormous change

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in concentration of economic power, and an absolutely amazing change in the power of technology and the progress of science.

### **Complete exclusion of externalities in prevailing metrics**

The role of externalities is completely ignored in the metrics that dominate the media conversation in modern society. This is a critical problem and very dangerous. It did not matter much when economic activity was small relative to the world, but this has changed. Now many multinational organizations are bigger than all but a few countries most countries, and the power of modern technology not only has become a huge power for progress but also has the capacity to blow up the world as became clear with the invention of the nuclear bomb about 70 years ago and now the new world of cyber warfare.

### **The GDP growth fallacy**

GDP growth has been used as a proxy for social progress for a long time, but it is deeply flawed. The problems with the GDP measure has been well known for decades, but it has not been replaced. With GDP growth it is much easier to make business profits, achieve increases in stock prices, and argue that everything is better with growth. More profits makes it likely that there will be more investment and then there will be more GDP growth.

This may sound like a virtuous circle, but it is not the whole story by any means because these metrics do not account for externalities. The GDP growth goal is arguably exactly the wrong goal for a sustainable society. GDP growth reflects higher levels of economic activity, but not necessarily in areas of the economy that benefit people the most and likely with significant added stress on the planet.

## **Areas of concern**

### **The role of productivity**

The industrial revolution has produced massive increases in productivity. In turn this resulted in improved quality of life for a larger and larger proportion of industrialized society. This virtuous circle got disrupted several decades ago, because with increased productivity it had become possible to produce all the goods and services needed with less labor. Better yet for profit, the efficiency of modern logistics and communications made it possible to optimize for profit by moving production to the lowest cost areas of the world.

These changes have changed the economic equilibrium in a way that is going to diminish quality of life for everyone that relies on work for their quality of life. The decline in the use of labor is resulting in lower aggregate demand which in turn will cause business revenues, profits and GDP to decline.

Since the early 90s, the impact of lower buying power from reduced workers wages has been mitigated first by the growth of consumer credit, and later, by mobilizing savings represented by home equity. Eventually this bubble of phony economic strength burst,

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and it is increasingly recognized that there is a real economic problem that must be addressed.

### **Money, banking and capital markets**

The prevailing system of metrics do not describe the performance of the money, banking and capital markets sector in a useful way. The metrics of money profits, stock prices and GDP growth do not help to describe what these organizations contribute to the economy. To a great extent this sector merely moves wealth rather than creating wealth.

Money should be thought of as a lubricant in the machinery of the real economy. Money is neither the engine nor the fuel. A lack of lubricant and real machinery seizes up. Lack of money, lack of liquidity, and the economy does the same. This is the story of the economic crisis that started in 2007. Money should not be a constraint on economic activity and progress. Rather the constraint on progress should be the carrying capacity of the planet and the capacity of people to develop and deploy innovations that improve quality of life and reduce stress on the planet. The constraint should be the shortage of people with great brains rather than the money that gets deployed to fund their efforts.

### **Concentration of economic power**

The multinational corporation is a form of organization that allows the organization to optimize its profit performance at the expense of everyone else. They are able to choose the legal regime in any way that will benefit the corporation, and at the expense of everyone else.

In a multinational organization, optimizing for profit and benefit for investors usually has negative results for people and planet unless there are concerted efforts within the organization to avoid these outcomes. This is not common.

### **Nations and governments**

The national economy is one thing, the government is another. They are not the same. The national accounts are about the performance of the national economy which is the totality of both the private and the public sector.

Government accounting is about the government. It is almost exclusively a cash based system, and accordingly subject to all the abuses that cash based systems allow. Government accounts and the government budget are only about the revenues and the payments of government and the public sector part of the national economy. The revenues of government are the proceeds of taxation, user fees and the sale of debt instruments. The payments are everything that are paid for by government. There is no accrual process and there is inadequate differentiation between operating and capital expenditures.

### **Big needs, unemployed people and no jobs**

There is a dangerous systemic dysfunction when there are big needs that go unsatisfied, no jobs being offered by established organizations and a large number of unemployed people, many of whom are young and well educated.



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The prevailing system of metrics is not capable of providing the data and analysis that will optimize the operation of society and the economy to address this situation. This is mainly because of the domination of the terrible trio and the focus on organization to evaluate performance.

### **Many critical metrics are missing**

Many critical metrics are missing. There are no metrics in widespread use that capture the impact on people and planet from economic activity, especially large scale economic activity implemented by corporate organizations. Many metrics are missing including:

1. Huge amounts of economic activity are carried out with virtually no metrics about the nature and scale of the activities. Very large privately held corporations are in this category. Security and military affairs are in this category.
2. Very little data are available about the impact of economic activity on a place.
3. Very little data are available about the impact of a product or service in people and planet, though there is a huge amount of advertising and PR about the product
4. There is no workable framework to make it easy to account for and report on impact on people and planet.
5. There is no system of quantification of value so that impact can be measured with the same rigor that is used for business profit.
6. There are huge amounts of data inside the corporate organization, and there are substantial economic datasets within government.
7. Corporate data are used to influence the buy or not to buy decisions of people using advertising and PR. There is nothing like it to inform about the impact on people and planet arising from the life cycle of the product

## **Radical Reform of the System of Metrics**

### **Systemic reform**

There needs to be not one but a complete set of reforms to the present metrics and reporting. The new framework must make it possible; (1) to have rigorous data about money, impact on people and impact on planet ... the Triple Bottom Line; (2) to report summary information in a simple and meaningful manner; (3) to drill down to granular information that will help social and economic actors make better decisions; (4) an ability to easily understand the methodology used; and, (5) an efficient use of data that can be acquired from existing data flows and mobile apps.

### **Purpose of economic activity**

The core purpose of economic activity has always been to produce the goods and services that people need to live. This has an ancient history going back to the stone age where all activity centered around having enough food and shelter for an individual, a family and a community to survive.

The ideas of Adam Smith in the 18th century helped to clarify how economic activity gets organized in order to be most productive. He talks about specialization and he talks about the 'invisible hand' of an efficient market that enables goods to be traded.

In the modern era it has become commonplace for an organization to define its purpose as to optimize the performance for investors and the owners of the organization. This reflects a modern legal interpretation of responsibility rather than what Adam Smith might have written as he researched *The Theory of Moral Sentiments* (published in 1759).

### **Beyond money profit and the 'Triple Bottom Line'**

#### **Money profit**

Performance that is based only on money profit results and financial return on investment is not enough. There is also the impact on people and planet that should be taken into account. The system of metrics for impact on people and planet should be based on a system of value that is quantified

The traditional way of doing analysis has been to focus on an organization do money profit accounting for all of the organizations involved., packaging a set of activities to sell to the customer. The norm has been for there to be a big effort to engage customers with the products being offered with the goal of making customers happy while paying well and making the organization profitable, but totally ignoring impact issues within the formal process of numerical analysis.

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### **'Triple Bottom Line' (TBL)**

A better way to assess performance of an entity is to include impact on people and planet as well as the money profit. The triple bottom line (TBL) has been helpful in starting to change the conversation about economic performance, corporate social responsibility (CSR) and sustainability.

The MDIA initiative puts money profit, impact on people and impact on planet into a single system where the three elements have an equal weighting. This requires a system to quantify impact as rigorously as there is quantification of money transactions that result in profit. The rigor should be the same, but the method will be radically different.

We need not only metrics that take into consideration the money flows that produce revenues, costs and profit, but the value flows that impact people and planet. These come together at an economic activity that get implemented in a place by an organization and in association with products.

For people, impact is change in quality of life. There are many complex interactions, but one of the most important is the wage earned from a job which in turn enables products which satisfy needs to be purchased. The money of wages subsequently feed into the place because of the local multiplier. The local multiplier is an important variable that can be changed as a result of people's buying behavior.

For planet, one impact is the depletion of resources. Money profit accounting ignores the depletion of resources (except for the money cost of buying access to resources, which is different from the issue of depleting the actual stock of resources on the planet). Some resources are finite and will run out. Some may be renewed, but the time and cost to do this must be accounted for.

For planet a second impact is the strain caused by waste whether it is solid waste, liquid waste or gaseous waste. The corporate world has a history of dumping all of these wastes outside the accountability boundary of the organization, and then ignoring the impact. The impact must be quantified, included within a relevant boundary and taken into account.

### **Not-for-profit performance**

It is not enough to judge impact in a not-for-profit setting by how much doing something has cost the organization. The question is not how much an activity has cost, but how much has the organization accomplished, which may have little relationship to the money costs disbursed. This has been a chronic weakness in the management systems of institutions like the World Bank, USAID and others.

DMIA uses the same analytical framework for both for-profit and not-for-profit organizations. In both cases the money flows should profit or loss, and the impact on 'state' of people and the 'state' of planet are computed in the same way.

## **Information that is meaningful and simple**

### **Purpose of information**

There are two reasons for having information: (1) to know whether or not there is progress or not and how good the performance; and (2) to know what are the causes of the progress (good or bad) and what should be done to improve the situation.

The reporting by organizations is a measurement of an organization's performance, which in turn is a result of decisions made inside the organization and by investors (whether or not they want to invest) and customers (whether or not they want to buy the products) outside the organization.

### **Detail information that informs decisions**

Detail information will help to identify possible solutions that will improve performance.

Detail information may come from analysis of large amounts of data or simply from quite small amounts of very relevant data from simple observations. In many cases the latter can be very useful while also being very low cost.

### **Summary information that shows results**

A simple statement that shows change in 'state' serves as a very efficient way of reporting on progress. For the organization change in the financial balance sheet is the progress priority.

For a place it is the change in the 'state' of people, and the change in the 'state' of the planet. In both cases the change is partly a direct change and partly a change resulting from second level association.

## **Types of data**

One of the ways that data can be classified relates to the speed the data needs to change to reflect changes in the underlying fact. This has important implications for the design of data systems and the cost effectiveness.

### **Transaction data**

Using accountancy as the model, transaction data is high volume and changes very rapidly. The P&L accounts are used to aggregate all the detail transactions.

### **Balance sheet data**

Balance sheet information changes quite slowly. Many transactions may not change the balance sheet accounts by very much. It is very much easier to verify a balance sheet account that changes slowly than a P&L account that changes all the time.

### **Easy data**

A different category is something that can be described as 'easy data'. These data can be acquired with relatively little effort, while somewhat similar data may be much more difficult to acquire.

## **State, progress and performance**

### **Balance sheet and operating statement**

In double entry accounting, one of the core concepts is (1) the nature of balance sheet accounts and the accounts that make up the operating statement or profit and loss account.; and (2) the fact that profit can be computed either by looking at the profit and loss accounts for the period OR by comparing the changes in the balance sheet from the beginning to the end of the period.

### **State**

State is similar to balance sheet. State is a summary of the state of value at a moment in time for the reporting entity. Values included in 'state' relate to all the values associated with quality of life of people and the values of everything associated with the planet in addition to values normally denominated in money units.

### **Progress**

Progress is the improvement in 'state' from the beginning of the period to the end of the period. Because 'state' is a function of many factor, the relationship between costs (or value depletion) incurred to pay for activities may be greater or less than the resulting progress.

### **Performance**

Performance is rather like the statistics in a professional team sport. There are many ways to assess performance for the many elements in the socio-economic system.

One important measure of performance is the relationship between progress overall and the consumption of value associated with planet

## **Cost, price and value**

### **More than just price**

In order to understand the state of society and the economy it is useful to be clear about the meanings of cost, price and value.

Most consumers understand price, and most consumers are concerned with price. They work hard to get 'the best price'. In recent years, the search for 'best price' has been facilitated by the Internet and ubiquitous data about prices.

Consumers are also concerned with value, but the concept of value is imprecise. Worse, the idea of value is heavily influenced by asymmetrical information delivered as advertising and brand PR.

The consuming public knows almost nothing about cost. Cost information is well known inside a corporate organization, but hardly ever leaks into the broader society.

Again, advertising and PR gets used to justify price increases because there have been 'cost' increases, but nothing in this is verifiable by consumers and the general public.

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Furthermore there is a big move to use social media and other information to relate prices and reviews for products.

### **Cost**

Cost is important for the organization because cost is part of the equation:

$$\text{Revenue minus Cost equals Profit}$$

Cost, and especially the behavior of cost is well understood inside the corporate organization, and there are continuous programs of improvement ... meaning cost reduction ... within every well managed organization.

Cost needs to be better understood by public at large. A cost is a hard fact associated with the history of the product and what has gone into its production. Many times the word price is attached to situations where cost is meant.

### **Price**

It is something of a myth that prices are determined by supply and demand in the market. In general, prices are determined within a marketing organization based on models that relate price and cost to optimize for maximum revenue and profit.

$$\text{Price times Quantity equals Revenue}$$

What is going on with price is very visible to the public. Consumers buy products and services and they are exposed to price all the time.

### **Value**

Value is pretty much ignored in money profit accounting and the models that optimize for profit. However, value should not be ignored, because it is value that drives the buy or not to buy decision. Because of this corporate advertising of products and brand PR puffs up the value of a product, but only with respect to its consumption characteristics.

Worse value is not quantified with the same clarity that cost and price are quantified. Because value is not quantified, value drops out of the conversation.

$$\text{Standard unit value times Quantity equals Value}$$

With MDIA , the metrics for value become mainstream and the quantification of value will get applied to every single value element including all aspects of impact on people and planet.

## **Profit and valuadd**

### **Profit**

Profit is the result of from economic activity that has more more revenue than costs. It may be calculated in two quite different ways.

In the first way, all the revenues are added up, and all the expenses are added up, and the difference is the profit. The is the Profit and Loss Account in regular accountancy.

$$\text{Revenue minus Cost equals Profit}$$

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In an alternative way, the profit may be calculated by looking at the change in the balance sheet of the organization from the beginning of the period to the end of the period. This is a technique that is very useful in business situations where there are 'incomplete records'.

*Net Balance Sheet EOP less Net Balance Sheet BOP equals Profit*

Where EOP and BOP are End of Period and Beginning of Period

### **Valuadd**

In MDIA valuadd is similar to profit, but valuadd takes into consideration all of the externalities that are routinely ignored in regular accounting.

*Value creation less Value consumption equals Valuadd*

It is almost impossible to computer valuadd by adding up all the value creation activities and all the value consumption activities, but it becomes easier using the balance sheet method described above.

*State EOP less State BOP equals Valuadd*

Where State EOP is the value balance sheet at the end of the period and State BOP is the value balance sheet at the beginning of the period.

## **Quantification of value**

### **Difficult, not impossible**

The quantification of value is very important. Without quantification the default is that it is zero which is always wrong. Value is different depending on the context and the individuals concerned, but this only means that the quantification must be built around this reality.

### **The concept of standard value**

In corporate cost accounting there is a concept of 'standard cost'. The same general idea needs to be applied to value in the form of a schedule of 'standard values'. This forms a baseline or norm for values against which other perceptions of value can be associated. The quantification is done to have a profile of relative values, rather than something that is absolute and measured in money terms.

### **Building the standard value dataset**

The standard value dataset is built using a data entry system that is accessible on the Internet and as a mobile app. The value set is built for an individual and aggregated according to some of the main characteristics of the individual. For example: (1) location; (2) age group; (3) gender; (4) interests.

As the datasets develop it will become apparent what other characteristics should be used to group the value profile.

## **Value chain analysis**

### **Important because of complexity**

Value chain analysis is important because of the incredible complexity of modern production and distribution both in terms of physical facilities but also the associated legal and regulatory structures. A product will flow through a value chain as long as all the activities in the chain are financially and operationally viable. When one link is broken, everything stops. Value chain analysis in the DMIA framework also identifies where impact on people and planet is compromised.

### **Time, place and organization**

Value chain analysis may be done in various ways: (1) over time; (2) over geographic places; and (3) between different organizations. Value chain is the set of economic activities that starts with raw inputs of various sorts and ends with the final disposition of the outputs in the form of waste impact on the planet.

### **The product value chain**

The product value chain is a special instance of the value chain. The value chain of a product starts with the beginning of the supply chain and runs through all the economic activities of the supply chain, then goes into a use phase, and finally enters the post use waste chain.

The value chain analysis of a product helps to inform consumers about the products and services they buy and may be used to influence the buy or not to buy decisions in the economy.

## **Organization, place and product**

### **Primary reporting entities**

Organization, place and product are the primary reporting entities. The same originating data from the individual economic activities are used for the aggregation into these three different entities.

### **Boundaries**

Boundaries are an important part of the regular accounting framework and determine how the reporting is done. In regular accounting it is normal for the reporting boundary to be drawn tightly around the organization taking into consideration its legal structure. This has the effect of excluding externalities in every way.

In MDIA there are multiple reporting boundaries to reflect the complex nature of the economic system and society. In MDIA there may be a tight boundary around an organization to reflect the performance of the organization, but the data are structured so that even in this situation the impact of external factors are brought into the individual organization's reporting.



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### **Organization**

Most performance reporting in the modern economy has a focus on an organization. Inside an organization there are massive amounts of data and analysis all aimed at making the organization perform as profitably as possible. This is where almost all cutting edge data analytics are concentrated.

Rather little of the internal data analytics is dedicated to optimizing the organization's impact on people and impact on planet. These performance perspectives are almost totally ignored in most corporate organizations.

An organization is private, and as such data about its performance are only made public as a result of law and regulation, and in order to promote the image of the organization to the public.

### **Place**

Place is essentially public and not private. Place is also permanent ... it never moves or disappears.

It is possible to walk around a place, and observe things. Observation can be converted into data about the state of the place.

A place is where economic activities are located. The performance of individual economic activities in a place are the core components of the aggregate progress and performance of the place.

### **Product**

Goods and services ... product ... is the link between economic activity and individual and collective decision making about what to buy or not to buy.

Every product has a value chain that goes from the beginning of the supply chain, through various buy or not to buy decision points, through use and into a post use waste chain. A number of economic activities interact with products to change them in some way as they progress through this value chain.

Organizations make huge expenditures to promote products through advertising and brand PR, all aimed at getting a favorable outcome at the buy or not to buy decision point of the product. Organizations are funding the use of 'big data' analytics to provide product reviews to supplement and support the advertising and PR.

MDIA aims to add other information about 'product' so that the whole value chain impact of product is as fully understood at the time of the buy or not to buy decision as the price and the review information.

## **National level analysis**

### **Economic performance**

National level economic analysis has evolved over the past 200 years, and is quite sophisticated. It is used as the basis for policy choices at the national level.

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National level analysis is better than nothing, but it is based on many analytical ideas that ensure a sub-optimization of socio-economic performance.

The dominant metrics is Gross Domestic Product (GDP), a measure that has been regarded as being inadequate for well over 50 years. It remains in use probably because GDP growth facilitates easy profit improvement for organizations and related stock price increases.

There are many sector level metrics at the national level. These metrics are good for tracking progress, but all of them are not well suited to decision making to improve performance.

### **Addressing deficiencies in national level metrics**

The MDIA initiative does not address the deficiencies of the national level data systems, but simply uses them to validate the effectiveness of the MDIA framework for optimizing socio-economic performance. MDIA is a complementary system, that will result in many of the national level performance indicators to improve.

### **Data for national security**

It should be noted that there are cutting edge data analytics in some national level organizations, notably organizations engaged in national security work, intelligence and defense. Not much is known publicly about these systems, but it is fairly common knowledge that they are as powerful or more powerful than the best analytical systems deployed in private sector organizations.

## **Individual, family and community**

### **Putting people at the center**

A healthy economy is going to be one where people are benefiting to the maximum from productivity improvement. This is a big change from what has prevailed since the early 1980s. Since that time most productivity improvement has been captured by the organization as profit, with less and less benefit flowing to people.

### **Individual**

Individuals have many different roles in society and the economy. They are investors, executives, workers, customers, suppliers, members of families, in circles of friends and members of communities.

Individuals are affected by the income they have, the wealth they have, their families, their friends, their communities, their health, their education, their opportunities ... and a whole lot more.

It is the improvement in the quality of life of an individual that is perhaps the most important measure of progress and performance of a society and the economy.

### **Family**

A family is an important aggregation of individuals. There may not be many money transactions that get recorded within the family unit, but there are very important value

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transactions that go on inside the family. These are incredibly important in the quality of life of every individual.

### **Community**

A community is an important aggregation of individuals, or families and all sorts of economic activities that are all connected in a myriad of complicated ways.

A community and a place have a lot in common. As a first approximation they may be considered to be the same, but they may not be. This will not be explored further at this time.

The impact of economic activity on a community or place depends on the local multiplier. The data should be granular enough so that this element of economic performance can be optimized as individual and business decisions are made.

### **Meaningful metrics from incomplete data**

One of the realities of analysis is that data are almost always incomplete or inadequate. In spite of this, there is a need to do analysis and draw conclusions. In most cases, statistical methods are used to compensate for the lack of data, and this is better than nothing, but MDIA does it differently.

In the case of double entry accounting, the relationship between balance sheet change and profit comes to the rescue. In the MDIA system it is change in 'state' that gives a reliable measure of progress.

Better yet, where a component of 'state' does not change, there is no need to spend effort on getting a value since it is the change that determines progress.

### **Some other issues**

A modernized system of metrics should work for every type of organization: for profits, for not-for-profits, for governments, for religious organizations, for small entities and for multinationals, for entities in every sector, etc.

The system should be easy to operate, and yet be effective in everything it is trying to do. Part of this is going to be the idea that issues that are material should be obvious, and less material issues filtered so that they do not confuse.

The system should be able to include the quantification of risk in a way that is clear and does not confuse.

The system should be able to address the issue of present value and future value in a way that is clear and makes the issue of present and future easier to understand. The present widespread use of 'discounting the future' should be modernized in an appropriate way.

An effective modern system will be a uniform system that has applicability everywhere there is economic activity.

## **Metrics for an Economic Activity**

### **Economic activity at the center of MDIA**

An economic activity is at the center of MDIA. An economic activity is relatively simple, located in one place, easy to describe in every interesting aspect of its operations.

The framework for the analysis of an economic activity includes: (1) the money profit dimension; (2) the impact on people dimension; and, (3) the impact on planet dimension. These metrics are sometimes referred to as the 'Triple Bottom Line' (TBL).

The MDIA initiative goes beyond most standard TBL initiatives in several ways:

1. a system of quantifying value using the concept of 'standard values' similar to 'standard costs' in cost accounting;
2. having a focus on an economic activity rather than an organization;
3. having aggregation of economic activity consolidating to organization;
4. having aggregation of economic activity consolidating to place;
5. integrating product value chain into the system from initial stages of the supply chain to the final stage of the waste chain; and,
6. using the balance sheet change as a key measure of progress.

### **Money profit**

#### **Money profit and financial return on investment**

Money profit accounting is the same at the economic activity level as it is for a total organizations. It may be likened to departmental accounting in a bigger organization. The basic concept in money profit accounting is that revenues less costs equals profit.

#### **Revenues**

The revenues are a function of price, which in turn depends on the level of enjoyment by the customer and the perceived value of the experience, and hence how much the customer is willing to pay.

#### **Costs**

Costs are a function of the product and productivity. There are many types of cost including, the wage and salary payroll, the payroll benefits, raw materials, other purchased materials, use of equipment, and marketing and distribution costs.

#### **Productivity**

Productivity is good for profits because it enables more production and therefore revenues for less labor. A similar improvement in profit is also possible by moving production from a location with high wage rates one with low wage rates. The result of reduced salary costs is not only improved profit but also a bad impact on people (see below),

## **Impact on people**

### **People as a business cost**

The impact on people includes the impact on the owner / investors associated with each of the economic activities.

### **People receive salaries as workers**

Earnings from an economic activity are at the central core of a healthy economy. These earnings make it possible for workers to purchase what they need. This is arguably the most important linkage in the economic system, and increasingly at risk as technology reduces the need for labor in an economic system that makes more and more use of automated production.

### **People receive salaries as executives**

The earnings from an economic activity paid to executives are partly used to purchase what is needed, but the amount of salary usually goes way beyond this minimum to something that represents reward for decision making and management which may be reasonable or unreasonable depending on the amount.

### **People receive benefits as investors**

Some people get benefit from investment. Up to a point this may be considered a fee for the use of money, and beyond some point the benefit may be something that represents remuneration from exploitation which may or may not be reasonable.

### **People get benefit as members of a worker's family**

A worker's remuneration has secondary impact that is substantial because of the use of this salary to provide for the needs of the family. A small wage is not enough to provide well for a family with children, but is massively better than no wage.

### **People get benefit as members of a community where paid workers live**

Most of a worker's remuneration gets spent, and to the extent that this spending is for goods and services that are produced in the place or community then there is a multiplier effect. The multiplier effect may be anything between 2 and 10 depending on the characteristics of the community.

## **Impact on planet – depletion of resources**

There are a range of impacts on the planet that are related to resource consumption and the depletion of a finite, albeit large, stock.

### **Depletion of mineral resources**

Use of most products involves the consumption of mineral resources, and the depletion of the resources of the total planet.

### **Depletion of fossil fuels**

Use of energy usually involves the consumption of fossil fuels, and the depletion of fossil fuel inventory for the total planet.

**Degradation of land**

Land is limited, and best use should take into account not only the opportunity to make profit, but also the impact of depletion or degradation of the land, and the environment associated with the land including bio-diversity.

**Destruction of bio-diversity**

This is a silent problem, but growing dramatically. The survival of life depends on bio-diversity which is now declining at a rate that is many times bigger than anything ever experienced in history.

**Impact on planet – degradation of the environment**

**Solid wastes**

There are a range of impacts on the planet that are related to the waste that results from almost every form of economic activity. There are multiple waste flows in three classes:

**Use of water and water pollution**

Water is the most important compound in everything, but it is treated in business metrics as unlimited in availability and of little or no cost.

**Atmospheric pollution ... particulates**

Particulate pollution. At the height of the industrial revolution in Europe, particulate pollution was a serious and dangerous problem. The 'smog' of 1956 in the UK was a countrywide blanket of fog together with industrial particulates that ended up killing hundreds.

**Atmospheric pollution ... Sulphur**

Acid rain is produced by SO<sub>2</sub>

**Atmospheric pollution ... Nitrous Oxides**

Nitrous oxides. Urban centers where building boilers are burning diesel for heating and automobiles are burning gas for transport produce massive amounts of nitrous oxides unless the offending compounds are removed from the fuels. This has been mandated in some places, but not everywhere.

**Atmospheric pollution ... Greenhouse Gases**

Greenhouse gases are primarily carbon dioxide (CO<sub>2</sub>) and methane (CH<sub>4</sub>). These are invisible and for climate change deniers might as well not exist. But science has shown that these gases are resulting in atmospheric changes that we cannot fully understand and predict. Reduction is a start, but the eventual elimination of the release of these gases into the atmosphere is probably the best goal.

### **Impact on planet – the built environment**

The built environment has a huge impact on the performance of society and the economy. A big part of quality of life is determined by the performance of the built environment. The built environment explains why some societies have better performance than others.

The built environment includes such things as:

- Housing;
- Commercial buildings;
- Factories;
- Facilities for sports and culture;
- The transport infrastructure; and
- The communications infrastructure

## **Metrics for Place**

### **All economic activities are located in a place**

A place is important for many reasons. A place does not move in the same way that an organization or a project can move. A place exists essentially in perpetuity.

A place can be real world demonstration of the whole being better than the sum of the parts. ... or vice versa. It is possible for an economic activity to be doing everything right, but the impact on society and the economy ends up being nothing. This is a big part of why the funds flowing into international development assistance often do not end up producing useful results.

Because the dominant metrics for the past two centuries have been those that apply to an enterprise, the impact on place has been largely ignored.

Analysis of economic activity over the years does suggest however, that the place has been the source of great wealth in large part because the place was where valuable minerals were located and could easily be extracted at low cost. This is the story of the American West, of Kimberley in South Africa and of Nigeria in West Africa. Great profits were made while the resources were being exploited with no accounting for the lost value and impact on planet.

### **Aggregation for the place**

#### **Entities in the aggregation**

The process of aggregation makes it possible to understand in a very granular way how the local economy functions. As in corporate accounting, the consolidating details are more interesting than the summary consolidation, because they have a granularity that facilitates decision making.

Every economic activity in the place should be a component of the aggregation. In some cases performance of a place can be understood without all the economic activities being in the data.

In the case of analysis of the health situation place, for example, one or many economic activities not associated with health can be excluded.

#### **Money profit**

The money profit aggregation has a different utility in the analysis of place than the analysis of organization. The money flows in a community show how dependent the community is on the outside economy, and how important the local multiplier is in the general health of the local economy.

#### **Impact on people**

The aggregation of impact on people and planet is very important at the place level. Progress should be determined using the balance sheet approach referred to above.



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### **Impact on planet ... depletion of resources**

There are two ways in which depletion of resources impacts at the place: (1) the actual extraction of resources in the place through mining, petroleum drilling or water consumption; and, (2) the use of products that have depletion of resources as part of their value chain makeup.

### **Impact on planet ... degradation of the environment**

There are two ways that degradation of the environment impacts at the place: (1) the actual degradation of the environment through various forms of waste arising directly in the place from local economic activity; and, (2) the degradation of the environment associated with the products used and the products produced in their respective value chains

## **The 'State' and the 'Progress' of the place**

### **State and progress ... people**

Progress is change in state.

For people, state is about quality of life, and all its components.

### **State and progress ... planet**

Progress is change in state.

For planet, state has two main parts: (1) the depletion of resources; and (2) the degradation of the environment. In both cases part of this arises as a result of the economic activity in the place, and part is associated with the value chains of the products consumed and the products produced.

### **State and progress ... effectiveness of the economy**

Progress is change in state.

The effectiveness of the economy is another dimension of state. There can be more progress in an economy where the enabling environment is good, than one in which the enabling environment is poor. The enabling environment has many components ranging from the rules and regulations governing economic activity, the infrastructure, the availability of skilled workers, the availability of essential materials, and so on.

## **Metrics for the Organization**

### **The present system of metrics for the organization**

The present metrics of the organization have money profit accounting at the center. Inside the organization there are a vast array of additional systems that help to optimize profit performance and perception so that there is stock price maximization.

Progress towards reporting impact on externalities over the past few years has been significant, but, compared to the established power of money profit accounting, remains tiny, and essentially irrelevant in the big decisions being made by business leaders.

Money profit accounting and reporting is tight, short and to the point. Impact reporting is anything but tight, long and in the end practically useless.

A lot needs to change.

### **Aggregation of economic activity data up to the organization**

The money accounting aggregation is the same as a normal corporate business consolidation.

The impact on people is done using the balance sheet change approach referred to above.

The impact on planet is done using the balance sheet change approach referred to above.

How much progress in a place is attributable to the economic activity associated with organization is going to be a judgment call, but often very clear.

The organization may have a single activity, or it may have many activities located in many different places.

Inside corporate accounting, top management is interested in the aggregated consolidated results, but they are also interested in seeing the information that goes into the consolidation, the consolidating statements.

### **Consolidating analysis by economic activity**

A large corporate organization may have many hundreds of different economic activities in many hundreds of places. Some of the economic activities may be quite benign, but others may have impacts on people and planet that are not.

The value of a consolidating analysis is that the performance of each specific economic activity is on the record, and because it is associated with a specific place, the validity of the information may be determined by inspection at the location.

To the extent that a corporate organization is unwilling to make available information about its economic activities in various places, it is possible for the public to 'fill in' the information by external reporting on the performance of the organization and its economic activities at any location.

### **Consolidating analysis by product**

Similarly a large corporate organization may have many hundreds or more likely many thousands of products that are either consumed by the economic activities of the organization or are produced by these economic activities.

Some of the value chain of a product will be within economic activities that are being operated by the organization and some parts of the value chain will be operated by other organizations.

The total organizational performance will have two parts:

1. the part that is taking place within the economic activities run by the organization;  
and,
2. the part of the supply chain, the use and the waste chain that is operated by others.

Both have to be associated with the reporting of the organizational entity.

## **Metrics for Product**

### **About product**

Product is used throughout to be both goods and services. The performance of society and the economy depends very much on the whole of the value chain for all the goods and services ... product ... that flow through economic activities.

### **The supply chain**

Every product, all goods and services, used by an economic activity have a supply chain, and in the course of this supply chain there is either value destruction or value add. There are very limited data about this, and getting the needed data is not easy. However, it is a step forward to identify this area of missing data.

### **To buy or not to buy**

It is 'product' that is at central to the decision to buy or not to buy. This is recognized in the corporate world as being of critical importance. The corporate world makes a substantial commitment of its financial resources to underwrite advertising and brand PR, because of a well justified belief that this drives customers to buy.

### **Impact of using the product**

When a product is used, there are impacts on people and planet that might be either good or bad, or a combination of both.

An item like an automobile is good insofar as it provides convenient transportation which is a positive for quality of life for people, but it is also bad as it uses energy which is depleting the resources of the planet. The burning of petroleum also produces pollutants that enter the atmosphere and contribute to degradation of the environment. Both the good and the bad need to be taken into account. The same logic applies to almost any item that is used.

### **The post use waste cycle**

When a product is no longer being used, it becomes part of a post use waste cycle. The post use waste cycle may be scrapping the product and dumping it into a land fill, or otherwise letting the product degrade the environment. Some products are worse than others in the damage that they do to the environment in the post use waste cycle,

### **Aggregation for product**

The purpose of aggregating for a product is to influence the buy or not to buy decision. This is the time when a buyer's behavior is going to have the biggest impact on the performance of the economy

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The money profit aggregation into product is well known by the organizations involved. This is the profit and loss of the supply chain, with optimization so that profit is maximized and the investment minimized.

Over the past 30 years technology has made logistics a very efficient part of the global economy, and this has made long supply chains possible in ways that were not possible a generation ago. But it has all been about profit and nothing about impact on people and planet.

However, the aggregation of impact on people and planet across the product life cycle is potentially a game changer. Ordinary people make buy or not to buy decisions based on price and perception of value. This conversation is dominated by business advertising and brand PR without much information about impact on people and planet along the supply chain and during use and in the post use waste chain.

## **Metrics for Me (People)**

### **The purpose of data for the individual**

Aggregation makes it possible to understand progress. Disaggregation makes it possible to inform decision makers more effectively at the point of decision.

There needs to be data to inform an individual about the impact of decisions that are being made by the individual.

The buy or not to buy decision by an individual is a small decision, but it is made many of billions of times a day, and in most cases, there is no data to advise on the impact of the decision, either pre decision or post decision. This needs to be changed.

The importance of this is fully understood by the corporate commercial sector who have funded the development of a very sophisticated advertising and public relations infrastructure for over a century. Corporate advertising and brand PR makes it possible for anyone contemplating the purchase of a product to be told how good it is, and how it will improve the buyer's quality of life.

But virtually nothing is available to advise the possible buyer that this purchase is going to have a chain of adverse impacts on people around the world and the planet we have to live on. This needs to be changed.

An individual is the source of decision making and therefore of importance in behavior change that impacts everything.

An individual is also part of a family. The economic flows that impact an individual also have impact on the individual's family.

In addition the economic flows that impact an individual and a family also have impact on the larger place or community. This is recognized in economics as the multiplier effect.

### **Quality of life (QoL)**

Maintaining and improving the quality of life for real individual is the central purpose of economic activity. The prevailing metrics do not measure this in a meaningful way. There is, maybe, an assumption that more GDP per capita means also that quality of life is maximized ... but this has been debunked a very long time ago.

An individual has quality of life, which is perhaps the main goal of economic activity. Economic activity that enables improvement in quality of life also generates a variety of other outcomes that have impact on organization, other people, place and planet.

### **Decision making ... to buy or not to buy**

An individual makes decisions that result in improved quality of life, in the main by choosing to buy goods and services that offer the best value for money.

## Multi Dimension Impact Accounting (MDIA) An Introduction

*The value for money proposition is the focus of advertising and promotion.*

*There is no equivalent flow of information about the impact of the product on people and planet from the start of the value chain for the product to its end.*

This information asymmetry results in a society and economy where the buy or not to buy decision is based on data that favors the organization without data that informs about other important things.

### **An individual's quality of life**

An individual's quality of life has many components.

Some of these can be bought with money, and give a direct impact on quality of life. Having money and earning money enables the purchase of the necessities of life. These items are in this category:

- Payments for water and food;
- Payments for shelter;
- Payments for clothing; and,
- Payments for recreation.

Some can also be bought for money, but the impact on quality of life does not come immediately but at some point in the future. These purchases are in this category:

- Payments for healthcare; and
- Payments for education.

Many aspects of an individual's quality of life are not bought for money alone, but result from behavior that is not directly related to money transactions. These quality of life components are in this category:

- The value of family;
- The value of friendship;
- The value of community;
- The convenience of things (like ease of buying things)
- Accessibility to what one wants;
- Financial security; and
- Physical safety and security ... lack of violence.

There are some aspects of an individual's quality of life that are controlled by fate and by others. These include:

- Some health issues;
- The macroeconomic environment;
- The state of development;
- Catastrophic weather events and natural disasters; and
- The macrosecurity environment.

### **Data to enable incentives**

As the MDIA initiative matures it should be possible to use data to drive incentives that will encourage individuals and organizations to modify behavior in the interest of the greater good.

There are many ways that incentives can be designed ranging from those sponsored by individual organizations to those that are supported by communities and even national governments through tax policy.

There is no question that incentives around optimizing for profit, people and planet will deliver a healthier society and planet than the prevailing system where the only incentive is a result of more and more GDP growth, more and more profit and higher and higher stock prices with all the damage to people and planet being totally ignored.



## **Next Steps**

### **Strategy for ongoing development and deployment**

The best way forward is going to be one that respects the potential of modern technology and wide collaboration.

### **Technical development**

The MDIA system needs to be translated into a systems that use best practice in modern data acquisition, processing, storage, analysis and access. The preferred architecture will include use of mobile smart phones and cloud storage. The system should have information about everything just a click or a swipe away.

A top priority is going to be the building of a mobile app that enables to creation of the standard value database. This may proceed ahead of the deployment of the full system.

### **Collaboration**

There are many ... perhaps hundreds ... of initiatives that have the goal of improving metrics about socio-economic performance and sustainability. Much of the work being done in these initiatives has value in the context of the MDIA initiative. Accordingly it is planned to reach out to many of these initiatives to work towards collaboration that will make available metrics easier to use and more powerful.

Engaging with the established accountancy profession and service providers to this industry may be an area of collaboration. This has the potential to be a game change for both the accountancy profession and the software industry providing management information and accounting systems.

### **Marketing and promotion**

Getting acceptance of the MDIA system by the business and investment mainstream is going to take considerable marketing and promotion effort. What this will be is not yet clear, but without good marketing and promotion the ideas will not gain significant acceptance, and will ultimately fail.

### **Ongoing conceptual development**

The MDIA system is now based on a solid conceptual framework. Over time it is likely that this can be improved further to focus on metrics that are the most value to support behavior change to improve society and the economy while doing the least damage to the planet. The MDIA as it now stands is the beginning, not the end.

### **Monetization**

The way to for the MDIA initiative to be monetized is not clear yet. In many ways, the value of MDIA is in chronic tension with the interests of much of the established order. Advertising which is a mainstay of monetizing many technology initiatives may not work with for the MDIA initiative. On the other hand, the philanthropic community interested in impact investment and some responsible business leaders who have embraced CSR and sustainability may become interested in enabling the development and deployment of the system.

### **Consultancy and training**

Consultancy and training are going to be needed to facilitate the deployment of MDIA. This could be a way to finance the ongoing development and deployment of the system.

### **Portfolio of working examples**

A portfolio of working examples of the DMIA system will be built as soon as possible.

### **Building a team**

Building a team is going to be a priority. Some work in this direction has been started with a growing group of people interested in the work of developing DMIA.

## **More Material ... References**

### **Examples of economic activities using MDIA**

A separate paper is being prepared that will show how the MDIA framework applies in a variety of economic activities. The tentative title of the paper is 'Examples of economic activities using MDIA'. The paper and the examples will be available on line at [www.TrueValueMetrics.org](http://www.TrueValueMetrics.org)

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