



New Paradigm Initiative

Re-discovering Measurement

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1. Introduction and Executive Summary

- (1) VMRC's "New Paradigm Initiative"(NPI) has been created to explore value and performance measurement approaches that extend beyond the traditional accounting paradigm.
- (2) Over the past 15 years, a consensus has emerged in the business community about the importance of intellectual capital and intangibles, and the need for broader measures of corporate performance than are provided through traditional accounting.
- (3) In response to this demand for alternative measures of value and performance, innovators have developed more than 80 new approaches, ranging from highly specialized techniques for valuing specific classes of intangibles, to broad frameworks for reporting on corporate performance. These approaches can be classified into into five categories, based on whether they are primarily concerned with: Intangibles; Indicators; Market Capitalization; the Capitals, and Value Streams. Some of these approaches have become widely adopted, and have stimulating the desire in the business community for enhanced disclosure of information useful for evaluating corporate performance and value potential.
- (4) Traditional accounting has evolved over hundreds of years. Over the past forty years or so, this evolution has been guided by rigorous formalized standard-setting processes operating both at the national level in a large number of countries around the world, and increasingly at a global level through the activities of the organizations such as the International Accounting Standards Board (IASB).
- (5) By contrast, the focus of the innovators who have developed the alternative measurement approaches that have appeared over the past 15 years has been to respond to the needs of users for new insights and perspectives. While "best practices" are emerging, the alternative measurement approaches have not so far been subjected to formalized standards processes.
- (6) The new measurement approaches differ widely in objectives, inputs and outputs, and methods, both from traditional accounting, and from each other. Given these differences, it has until now been difficult to assess individual approaches or compare one approach to another, relative to such characteristics as: the user needs each approach is designed to address; what objects and properties each approach actually measures; the overall validity of the approach; and other technical attributes.
- (7) One focus of VMRC's New Paradigm Initiative is to assemble a set of measurement concepts and criteria that can be used to "profile" value and performance measurement approaches, in such a way that each approach can be compared with others in a meaningful way. We build on the foundation provided by an important paper published by the Fédération des Experts Comptables Européens, which offers a compilation of concepts and criteria drawn from measurement theory, information theory, and the conceptual frameworks of accounting and auditing standard-setters. These concepts and criteria have been organized into a practical framework and online system that can be used to visually show the similarities and differences among measurement approaches relative to the concepts and criteria.
- (8) What becomes apparent from the initial trials of the online measurement profiling system is that the leading approaches in each of the five categories referred to in (3) above, and described in more detail in Section 3, have fundamentally different profiles. NPI's online system for analysing "measurement profiles" serves a number of purposes for users, practitioners, the innovators of new measurement approaches, and those interested in the technical aspects of measurement.
 1. By clarifying what each measurement approach is optimized to measure, and the circumstances under which it is likely to be most successful in doing so, users are better able to select the approach, or the portfolio of approaches, that best serves their needs. This will also benefits practitioners, who are frequently responsible for selecting, installing or operating measurement systems as corporate executives or service providers.
 2. Those working to develop or enhance a specific new measurement approach can use the insights provided by the profiling approach to develop a deeper understanding of the technical strengths and weaknesses of their approach relative to the measurement concepts and criteria. This, combined with feedback from users and practitioners, can help them recognize where modifications to the approach could better meet the "target" profile sought by users and practitioners. VMRC expects this will stimulate

experimentation and development by innovators that will not only strengthen individual approaches, but advance the general measurement “state of the art”.

3. Those who are involved in efforts to enhance disclosure of corporate information, including measurement information, will be able to take into account the relative strengths and weakness of various alternative measurement approaches in deciding what additional measurement information should be disclosed, and how.
- (9) A second focus of this paper is to lay some groundwork for considering the degree to which these alternative measurement approaches may point toward a new measurement paradigm, that extends beyond, but complements, the traditional accounting paradigm.
- (10) Section 2 of this paper suggests that the situation of traditional accounting is much like that of physics a century ago. At that time, it was clear that while Newton’s equations still worked to explain the movement of objects and planets, scientists were increasingly aware of phenomena that could not be explained by Newtonian physics. Einstein’s work on relativity, published in 1905, presented an alternative way of understanding some of the workings of the universe.
- (11) Similarly, traditional accounting still works well to measure the performance of organizations, as long as what we want to measure is measureable as a real (historical) or hypothetical (fair value) transaction. The transaction-centric nature of accounting is arguably its greatest strength, but is also the source of its inherent limitations. If what business decision-makers want to know about cannot be measured by a transaction – such as the future value creation potential of the enterprise, or the contribution to that value potential of knowledge and ideas – then traditional accounting will not be able to help. However, there has as yet been no accounting Einstein to point us toward a new paradigm. We are beginning to understand the problem: but we do not yet have a comprehensive solution.
- (12) When viewed through the lens of measurement concepts and criteria, it becomes easier to understand what are the boundaries of the traditional accounting paradigm, and to begin to imagine what might lie beyond those boundaries. It can be argued that accountants take measurement for granted. The key questions that arise in measurement theory – such as, what are the properties of the objects we want to measure, and what scale and units of measure do we need to measure them – are not matters of debate in accounting. Answers to these questions are implicitly embedded in accounting concepts such as “the lower of cost or market value”, and in accounting standards that build on those concepts.
- (13) Even if it were appropriate to take measurement for granted with respect to traditional accounting, it is not appropriate to do so when it comes to the alternative measurement approaches that are the stimulus for the New Paradigm Initiative. It is clear, for example, that performance indicators, such as those used in a Balanced Scorecard, measure different properties of different objects, using different units of measure and a different measure scale, when compared to traditional accounting. The question of whether users are in a position to appreciate the significance of these differences – when, for instance, performance indicators are presented alongside traditional accounting information in an corporate annual report – has not yet been thoroughly debated.
- (14) The New Paradigm Initiative has been launched in the conviction that meeting the needs of decision-makers for better ways to measure value and performance is an important and urgent task. We can learn a great deal from the innovators who have developed and enhanced the new value and performance measurement approaches that have appeared in the past 15 years.
- (15) Building on these measurement innovations, while collectively re-discovering some of the fundamentals of measurement, NPI intends to open a debate on what lies beyond the boundaries of the traditional accounting paradigm, in the expectation that doing so will stimulate further innovation and experimentation, and ultimately lead to a new global consensus on concepts and criteria for measuring value and performance.

2. The inherent limitations of traditional accounting measurement

2.1 What is the problem?

- (16) “Accountants Can’t Count Intellectual Capital”, declared Tom Stewart, formerly with Fortune magazine and now the editor of the Harvard Business Review. “Armies of clerks and banks of computers track physical and financial assets, but those accounting systems cannot cope with brainpower.” (Intellectual Capital, The New Wealth of Organizations, 1997, pages 56-58.)
- (17) Over the past decade, Stewart and many others have convinced a large proportion of the business community that the reason that intellectual capital is not on the balance sheet is because accountants do not know how to measure intangibles.
- (18) This view is not technically correct. Accountants are perfectly capable of measuring intangibles, just as they are capable of measuring tangibles, so long as there is a transaction. The issue that arises with attempting to expand recognition of intangibles in financial statements is not their intangibility, but rather that most intangibles are internally generated, and do not therefore arise as a result of a discrete third party transaction. (So far, corporate executives are not convinced that it would be worth the effort to implement systems to accumulate internal development costs and allocate them to specific intangibles.)
- (19) This example illustrates that the bedrock of traditional accounting is transactions with third parties. This reliance on transactions is both the greatest strength of traditional accounting, and the source of its inherent limitations.
- (20) The fact that most of the numbers are based on transactions with third parties is the most important reason why financial statements are considered by many to be “reliable”.
- (21) But the transaction-based, inherently backward-looking nature of the traditional accounting paradigm is also arguably its greatest weakness. It is the most important reason why more and more people question the relevance of performance measurement based on past transactions.
- (22) A transaction is, by definition, something that has happened in the past. When people characterize traditional accounting as “backward-looking”, they are only being factually correct. Traditional accounting is inherently backward-looking, because transactions, by definition, happen in the past. Yes, on occasion, in the preparation of financial statements, we anticipate transactions that might happen in the future. On occasion, we may restate certain assets at “fair market value” – in effect, substituting a value based on a hypothetical current transaction for that derived from a past transaction. But in most jurisdictions, the vast majority of the numbers financial statements are based on past transactions.
- (23) It is still *necessary* and *useful* for anyone interested in the performance of an enterprise to know what has happened in the past.
- (24) But it is not *sufficient* for anyone – management, investors, shareholders, regulators, and other stakeholders – to know only about what has happened in the past. Most people are at least as interested, if not more interested, in what will happen in the future.
- (25) What has happened in the past can often provide some insight into what may happen in the future. However, in a world of accelerating change (a premise that in today’s context is hard to dispute), what has happened in the past is increasingly less relevant to understanding what may happen in the future.

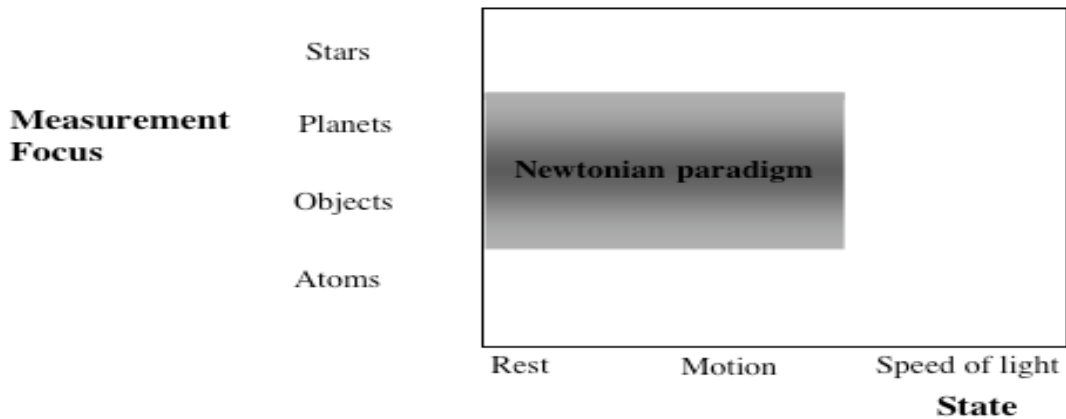
2.2 A BioPharmaceutical Example

- (26) To further illustrate the problem, consider the following fictional example. Assume that BioPharm is a well-financed startup biopharmaceutical company focused on developing genetic therapies which will ultimately be licensed to and distributed through major pharmaceutical corporations. BioPharm’s business plan calls for it to carry out research and development over a 10 year period, during which it does not anticipate it will have *any* licensing revenue.
- (27) Using traditional accounting measurement, BioPharm’s financial statements will show a string of increasing losses, year by year, as the R&D is expensed. However, could one reasonably

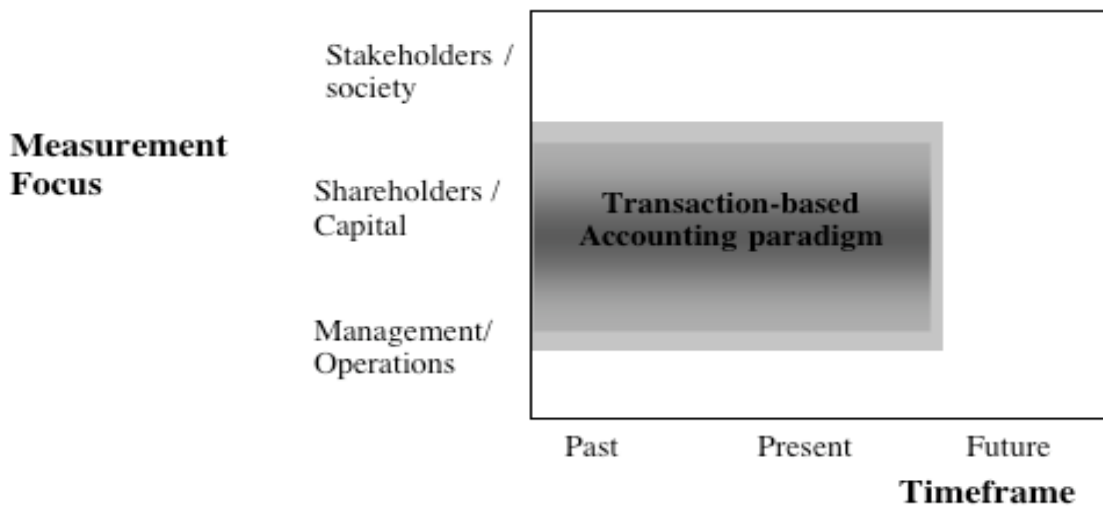
- conclude that during this 10 year period, BioPharm as an enterprise is creating *absolutely no value* for its owners or stakeholders?
- (28) Whatever value BioPharm is creating over time will not be revealed by a transaction-centric accounting system. This is true regardless of how the transactions are accounted for: whether or not R&D is written off, intangible assets are capitalized, or assets are restated at fair values. BioPharm's progress in creating value is a function of the creativity of its people, the effectiveness of its research processes, the strength of the intellectual property it develops, the activities of competitors, and so on. None of this can be measured through its recent financial transactions.
- (29) BioPharm is an admittedly extreme example, since it has no current revenue, and since its product development cycle is so long. But even if it had current revenue, or a shorter product development cycle, all of the above points are still valid. *The fact is that there is no necessary connection between progress in creating value in an enterprise, and the organization's recent financial transactions with third parties.*
- (30) One could argue that this is as true in the manufacturing enterprises of the past as it is with the knowledge-based enterprises of the present and future. However, with the manufacturing enterprises of the past, measuring recent transactions appeared to be a satisfactory proxy for measuring progress in creating value. When value creation was closely followed by value realization through a transaction (the mouse trap was manufactured in March and sold in April) concentrating on just value realization alone was good enough. This is no longer true today.
- (31) This train of logic leads to two fundamental conclusions:
- What transaction-centric accounting actually measures is the *realization* of value created at some earlier time. Measuring value realization is still necessary and useful, but not a sufficient basis for understanding organizational performance.
 - If we wish to provide relevant information to decision-makers, we need measurement that goes beyond the value realization transaction-centric paradigm.
- (32) This last point is the main stumbling block. Given that traditional accounting is transaction-centric, how could it be possible to discover a basis for measurement other than transactions?

2.3 A scientific analogy

- (33) The situation of financial accounting today is analogous to that of physics a century ago. At that time, leading scientists knew that Newton's laws could not be used as the basis for explaining gravity, the behaviour of the components of the atom, or the mechanics of light. To explain these and other phenomena, scientists had to progress beyond the inherent limitations of Newtonian physics.
- (34) In 1962, Thomas Kuhn wrote a landmark work on *The Structure of Scientific Revolutions* that popularized the concept of the "paradigm shift". Using a series of historical examples, Kuhn showed that scientific progress is not characterized by a steady stream of discoveries, each building on the previous one. Rather, we see a relatively small number of scientific *revolutions*, in which our understanding of the world shifted dramatically from one paradigm to another. A scientific paradigm consists of a set of accepted laws, theories, applications, and instrumentation. The research activities of the vast majority of scientists are characterized by Kuhn as "mopping-up operations" within the confines of a particular paradigm. Each scientific paradigm has fundamental limitations, revealed by the problems that cannot be explained within the boundaries of the paradigm. Hence, it was necessary for Einstein to develop a new paradigm – built around the theory of relativity – to account for phenomena that could not be explained by Newtonian physics.



- (35) In accounting as in physics, the issue is one of relevance. The need to transcend the limitations of the traditional transaction-based accounting paradigm arises because we need to be able to measure value creation in the modern economy, just as the scientists of a century ago needed to explain phenomena at the stellar and atomic levels that could not be modeled through Newton's equations.
- (36) Traditional accounting can be depicted as follows, recognizing that there is some debate about precisely where to locate the boundaries of the traditional accounting paradigm, which are determined mainly by the degree to which values other than historical cost, such as fair market values, are used to portray certain classes of assets.



- (37) Does the need for a new accounting paradigm mean abandoning transaction-based accounting? Not at all. While we talk of paradigm *shifts*, the fact is that in physics, multiple paradigms coexist. Newtonian physics is still useful, and perfectly adequate for predicting the behaviour of objects in motion as we drive to work in the morning. However, it does not provide an adequate basis for modern medical diagnostics or operating a nuclear power station.
- (38) Similarly, tracking an organization's performance based on historical financial transactions with third parties is still useful. However, it does not provide an adequate basis for measuring the value creation potential of knowledge-intensive organizations nor for tracking progress in achieving that potential.
- (39) Accounting standard setters have been and continue to be engaged in Kuhnian "mopping-up operations" within the traditional accounting paradigm, as they introduce new standards for accounting for acquired intangibles, or methods for accounting for financial derivatives. These, and similar incremental improvements to traditional accounting, are necessary and useful. However, they do not provide a way for traditional accounting to overcome its inherent limitations, which is

- that it cannot measure using transactions things that cannot be measured using transactions. Traditional accounting is inherently unable to provide insights into future value creation potential: it can only measure the ultimate realization of that value as transactions ultimately occur.
- (40) The idea that we might need a new value measurement paradigm in accounting is and will continue to be controversial. This too is perfectly predictable, based on Kuhn. We no longer physically burn scientific revolutionaries at the stake, but anyone who has followed an intense scientific debate, such as the one that rages on about climate change, will understand that we still do so, metaphorically.
- (41) Kuhn observes that the transition from one scientific paradigm to another does not occur because leading scientists change their minds. He quotes Max Planck, “surveying his own career in his Scientific Autobiography, sadly remarking that ‘a new scientific truth does not triumph by convincing its opponents and making them see the light, but rather because its opponents eventually die, and a new generation grows up that is familiar with it.’”
- (42) Hopefully, we would not need quite so drastic a solution as this in the world of accounting.
- (43) However, we could not expect that any proposed non-transactional accounting paradigm would be easy for the accounting profession or for corporate reporting standard-setters to accept or grasp, in part because the conceptual frameworks that accountants and standard-setters use are located entirely within the boundaries of the transaction-centric accounting paradigm.
- (44) We can expect that any proposals for a non-transaction-based approach will be attacked, as they have been already, by some adherents of the traditional paradigm. Such attacks will continue to take place despite the fact, to emphasize the point again, that there is no need to leave the transaction-centric accounting paradigm behind.
- (45) Within the context of its own paradigm – that is, within the boundaries of its inherent limitations – there is nothing wrong with transaction-centric accounting. It is what it is, and performs as advertised.
- (46) Just as Newtonian physics and Einsteinian physics co-exist in the real world, so too could the traditional value realization measurement paradigm and a new value measurement paradigm, as *parallel systems*.

3. Innovations in value and performance measurement

3.1 Five categories

- (47) Over the past decade, there has been an astonishing amount of activity by innovators attempting to measure value and performance beyond the boundaries of traditional accounting. Dozens of value measurement approaches have emerged, many of which are identified in Appendix A to this paper. For purposes of this discussion, we can group these new measurement approaches into the following five categories.

Focus	Value and Performance Measurement Innovations				
	Intangibles	Indicators	Market Cap	The “Capitals”	Value Streams
Selected examples	<ul style="list-style-type: none"> • FASB’s Intangibles Project • Value dynamics • Brookings Report 	<ul style="list-style-type: none"> • Balanced scorecard • KPI’s 	<ul style="list-style-type: none"> • Market Cap – Book Value Gap Analysis • Economic Value-based analysis 	<ul style="list-style-type: none"> • Intellectual Capital • Human Capital • Societal Capital 	<ul style="list-style-type: none"> • Intangibles value streams • Event-based enterprise value streams
How the innovators define the problem	<ul style="list-style-type: none"> • Intangibles not fully reflected in financial statements • Gap between market and book value 	<ul style="list-style-type: none"> • Accounting measurement is not sufficient basis for strategic management of enterprise 	<ul style="list-style-type: none"> • Enterprises are not managing gap between book (current operation) and market value 	<ul style="list-style-type: none"> • Enterprise are not managing major components of “capital” that account for the majority of enterprise value 	<ul style="list-style-type: none"> • Traditional transaction-based (value realization) accounting provides no insight into performance of organization in creating value
How the innovators describe the solution	<ul style="list-style-type: none"> • Measure and disclose fair value of intangible assets 	<ul style="list-style-type: none"> • Set goals and track performance using a broad framework of metrics 	<ul style="list-style-type: none"> • Decompose market cap into current and future growth value components, and create system for tracking drivers of future growth 	<ul style="list-style-type: none"> • Frameworks and systems for measuring customer, human, structural, and other ‘capitals’ 	<ul style="list-style-type: none"> • Parallel value creation measurement system that models the potential of future value streams and tracks performance in realizing it

- (48) People advocating approaches in the “Intangibles” category tend to focus on extending traditional techniques for measuring the value of tangible assets to the world of intangibles.
- (49) Those working on “Indicators” tend to focus on constructing a framework of metrics that extends beyond traditional accounting measurement.
- (50) The proponents of “Market Cap” approaches base their analysis on decomposing and/or influencing the market price of a company’s shares.

- (51) The adherents of approaches in the Capitals category argue that the best way to build the financial capital of an enterprise is to focus attention on the interrelationships among customer capital, structural capital, intellectual capital, and the other “capitals”.
- (52) The Value Streamers argue that rather than focus on the traditional concept of an “asset”, we can directly model the value creation potential of value streams, and the interactions among them, to create a forward-looking system of value creation measurement.

3.2 Measurement versus disclosure

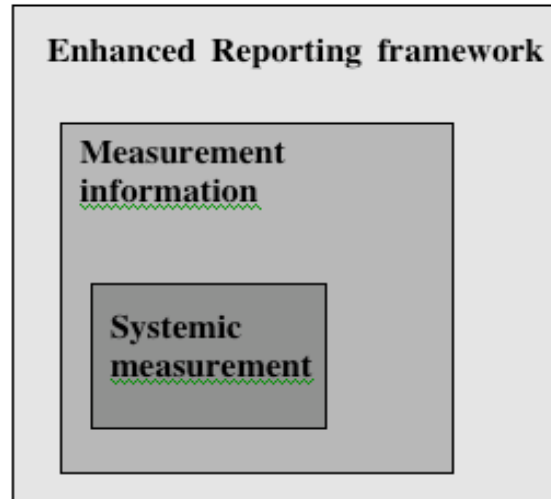
- (53) It is important to note that in compiling the list of innovations categorized above, the focus was solely on *measurement*, and not on corporate reporting or disclosure in general.
- (54) Work is underway within and beyond the global accounting profession focused on enhanced disclosure or reporting frameworks. To cite only a few examples, relevant projects include:
- the proposed Enhanced Business Reporting Consortium (EBRC) led by the American Institute of Certified Public Accountants (AICPA);
 - the “Information for Better Markets” campaign of the Institute of Chartered Accountants of England and Wales (ICAEW);
 - work by the Canadian Institute of Chartered Accountants (CICA) on MD&A Guidelines, and an earlier project on Total Value Creation;
 - publications sponsored by major firms, such as Price Waterhouse Cooper’s book “Value Reporting”;
 - exploration by various European institutes, the Global Reporting Initiative, and other international bodies of ways to report on intellectual, human, societal, and other forms of capital, and on various dimensions of sustainability.
- (55) In the context of these initiatives, what is meant by the term “reporting framework”. The Enhanced Business Reporting Consortium defines a reporting framework as:
- “A framework to enhance information relevance and consistency. This information includes information about opportunities, risks, strategies and plans, and about the quality, sustainability and variability of cash flows and earnings, as well as industry-specific, process-oriented value drivers and key performance indicators. “
- (56) A reporting or disclosure framework is evidently meant to convey something much broader than “measurement”. A reporting framework is intended to provide comprehensive guidelines concerning information of all kinds that a company should make available to its stakeholders, addressing both what should be disclosed and how. Only a subset of those disclosures are “measures”.

3.3 Comparing measurement approaches: systems and frameworks

- (57) In considering how alternative measurement approaches compare to each other and to traditional accounting, we are confronted with the need to differentiate between measurement approaches that are systemic and those that are not.
- (58) Compare, for example, a traditional balance sheet and income statement, and a set of key performance indicators. Both include quantitative measures, and to that extent are similar.
- (59) But there are crucial differences. The numbers in the balance sheet and income statement emerge from an accounting measurement *system*, in which the debits must match the credits. Any change to any number in a set of financial statements requires a corresponding change in some other number.
- (60) By contrast, a set of key performance indicators is generally not systemic, but rather, constitutes what can be referred to as a measurement *framework*. In a framework of key performance indicators, there is normally a logical relationship among the elements of the framework. However, the elements of a framework of key performance indicators are not related to each other in the same systemic manner as are the elements in a set of financial statements.
- (61) For purposes of this discussion, we can differentiate between *measurement systems* and *measurement frameworks* using the following criteria:

Measurement System	Measurement Framework
<ul style="list-style-type: none"> • Backed by an internally-consistent integrated “model” (a representation of reality) • Ability to link inputs and outputs through causal linkages • Constituent elements of model are non-arbitrary <p>Examples:</p> <ul style="list-style-type: none"> • Astronomical calculations • Traditional double-entry accounting 	<ul style="list-style-type: none"> • Discrete, standalone (but may be organized in a logical framework) • May indicate correlations (but not causal linkages) • Selection of elements of framework may be arbitrary <p>Examples:</p> <ul style="list-style-type: none"> • Political risk assessment • Key performance indicators

- (62) Planetary mechanics is a good example of a *measurement system*. The motions of the planets can be modeled with sufficient precision that it is possible to predict eclipses centuries into the future.
- (63) Weather forecasting is a good example of a discipline which formerly was not systemic, but has become so. The first weather instruments were invented about the same time as double-entry bookkeeping: the hygrometer was invented around 1450, the thermometer in 1592 by Galileo, and the barometer in 1643. The effort to make weather forecasting reliable began in the late 1800s. Vilhelm Bjerknes, a Norwegian, and Lewis Fry Richardson of Britain are credited as pioneers in the attempt to model future weather through a system of mathematical equations. In his first full-scale attempt, it took Richardson several months to do the calculations to support a six-hour forecast for an area near Munich – a forecast which was not only somewhat late to be a forecast, but was also wildly inaccurate even in hindsight.
- (64) Despite its lack of immediate success, Richardson’s attempt set the course for innovation in weather prediction. Now, just under a century later, satellites ring the globe providing thousands of real-time weather observations, complex computer models produce detailed forecasts of weather at multiple levels in the atmosphere, covering virtually all of the earth’s surface, and aviators and sailors can download “grid charts” from the internet providing an extraordinary amount of forecast data. Weather forecasting is not perfect: but it is systemic.
- (65) This line of thinking leads to the question: Are any of the alternative value measurement approaches in any of the five categories referred to in Section 3.1 “systemic”, or do any have the potential to become so with further development? This and other criteria are discussed in Section 5.
- (66) This line of thinking also leads to the observation that the relationships among disclosure, measurement, and systemic measurement can be depicted as follows:



- (67) It is evident that any enhanced reporting or disclosure framework will include a combination of measurement information that is systemic, as well as measurement information that is not systemic.
- (68) This leads to the following question: What are the implications for users, producers, and auditors of measurement information of combining systemic and non-systemic approaches within a broader reporting or disclosure framework? This question is not specifically addressed in this paper. However, the analysis in Sections 4 and 5 provides an initial foundation for addressing it.

3.4 A new value measurement paradigm?

- (69) Virtually all of the approaches in each of the categories described in 3.1 above were developed to meet the specific needs of decision-makers. In most cases, their practical utility for these purposes has been demonstrated in many successful implementations.
- (70) But there is a higher-level issue here. Many, if not most of these approaches were explicitly developed in an attempt to overcome the limitations of traditional accounting. In the context of the argument in Section 2, it is logical to ask: to what extent did they succeed?
- (71) In other words, do any of the approaches in the five categories represent the equivalent, in relation to value and performance measurement, of Einstein's breakthrough on relativity? Or do they simply represent incremental improvement on the status quo, but not a fundamental breakthrough? And how would we recognize the difference? By what criteria could we assess the degree to which any of these value measurement approaches is, or points toward, a new paradigm in value measurement? The next sections attempt to lay some of the necessary groundwork for addressing these questions.

4. Measurement Concepts

4.1 Measurement concepts: some basic definitions

- (72) Let us begin by considering what we mean by “measurement”. The Oxford Dictionary of English defines “measure” as follows:
- (73) As a verb:
- ascertain the amount or degree of something by using an instrument or device marked in standard units
 - take an exact quantity of something
 - judge someone or something by comparison with a certain standard
- (74) As a noun:
- the size, length or amount of something as established by measuring
- (75) Measurement is defined as “the action of measuring something”.
- (76) A related concept is “Unit of measure”, defined as “a quantity chosen as a standard in terms of which other quantities may be expressed”.
- (77) It is evident that in order to measure something in a way that provides insight to others, there needs to be some level of agreement about the unit(s) of measure.

4.2 Measurement fundamentals

- (78) The analysis in this paper draws heavily on the summary of measurement theory, information theory, and accounting theory included in the Issue Paper published by the Fédération des Experts Comptables Européens (FEE) in April 2003 entitled: *Principles of Assurance: Fundamental Theoretical Issues related to Assurance in Assurance Engagements*, referred to henceforth in this document as the “FEE Paper”. An extract of the key sections of the FEE paper relating to information, measurement, and accounting theory can be found in Technical Appendix B, which is available from the NPI website at <http://npi.valuemeasurement.net>.
- (79) In its review of measurement theory, the FEE paper reminds us of some measurement fundamentals:
- Measurement relates to objects; or more precisely, properties of objects; or even more precisely, properties of “systems”; or even more precisely still, indicants of properties of systems. (For purposes of this paper, it will in most cases be sufficiently precise to refer to measuring “properties of objects”.)
 - To measure something involves quantification of properties, based on some mathematical model. Quantification does not necessarily mean “numerical”: valid measurement scales can be:
 - nominal (determining whether something does or does meet some criterion);
 - ordinal (a scale in which things are arranged in rank order);
 - interval (a scale on which equal intervals between objects represent equal differences) or
 - ratio (a scale on which the ratios of the numbers assigned accurately reflect ratios of the magnitudes of the objects being measured.)Financial measures represent a ratio scale.

4.3 Measuring Value

- (80) According to the Oxford Dictionary of English, “value” or “values” have several connotations:

- the “regard that something is held to deserve; the importance, worth, or usefulness of something”;
 - the “material or monetary worth of something”;
 - the “worth of something compared to the price paid or asked for it”;
 - “principles of standards of behaviour; one’s judgement of what is important in life”;
 - and “the numerical amount denoted by an algebraic term: a magnitude, quantity or number”.
- (81) A “Valuation” is defined as “an estimation of the worth of something, especially one carried out by a professional valuer”. Related concepts include: value added, value analysis, value engineering, value-free, value judgement, value-laden, valueless, value received, valuable, and valuable consideration.
- (82) These definitions lead to the following observations and questions:
- Is value ever “absolute”, or is it always relative? For practical purposes, it is almost always true that value is “in the eye of the beholder”.
 - Values expressed in currency (e.g., this car is worth \$10,000) seem more absolute than “moral” values, but even in every-day life, we differentiate between monetary cost and value to a potential buyer.
 - Transaction value is in fact an amount that sits somewhere between the perceived value of something to a buyer and the perceived value to the seller: normally, a buyer will complete a transaction only if the acquisition cost is less than the value perceived by the buyer.
 - This logic suggests that “perspective” or “context” is relevant to any value measurement. In other words, every value measure inherently reflects a specific perspective, even if that perspective is not explicitly referenced or even recognized as such.
- (83) If we reassemble the term “value measurement” or “quantification of value”, the following observations emerge:
- Like all measures, one would assume that the “value” we want to measure or quantify is a property of an object or system.
 - The difficulty that arises is that if all value is relative or contextual, this would suggest that value is not strictly a property of an object or system, since we also need to take into account the perspective of the “beholder”.
- (84) This would suggest that value might be a property of a *relationship* that includes the object or system and the beholder, not of the object or system per se.
- (85) If we don’t want to go this far, at a minimum, we need to associate the idea of a “perspective” or “context” with the value-related property of the object or system.
- (86) To comprehend the significant of any quantification of value, it is therefore essential to:
- be aware of the object and properties being measured;
 - be aware of the perspective
 - understand the underlying mathematical system.

4.4 Measuring Performance

- (87) According to the Oxford Dictionary of English, to perform is to “carry out, accomplish, or fulfil” an action, task or function. “Performance” has several connotations:
- the “act of presenting a play, concert, or other form of entertainment”;
 - the “action or process of performing a task or function”;

- a “task or operation seen in terms of how successfully it is performed”;
- the “capabilities of a machine, product, or vehicle”.

Related concepts include: performance art, performance bond.

(88) These definitions lead to the following observations and questions:

- Is performance “absolute”, or “relative”? To the extent that we wish to differentiate between different levels of performance, it can be argued that performance is always measured in relation to some point of reference, such as an objective (e.g. performance targets), a standard (e.g., 9s sigma), or precedent (e.g., last year’s performance).
- Do we need to take “perspective” into account, as in the case of value? In other words, is performance in the eye of the beholder? Logic would suggest that perspective is a factor not so much in the interpretation of the reference point as in the selection of the reference point. That is, different beholders might choose different reference points for evaluating performance, but performance could be objectively determined in relation to each of those reference points without taking perspective into account.
- Any organization with multiple stakeholders faces the possibility that different stakeholders may adopt different reference points for differentiating between satisfactory and unsatisfactory performance.

(89) If we reassemble the term “performance measurement”, or “quantification of performance”, the following observations emerge:

- Is the “performance” we want to measure or quantify a property of an object or system, or a property of an object or system in some sort of relationship with the reference point?
- It seems likely that performance can be a property of an object or system, but that it has no real meaning apart from one or more reference points, whether or not those reference points are defined implicitly or explicitly.
- To comprehend the significant of any quantification of performance, it is therefore essential to:
 - be aware of the object and properties being measured;
 - be aware of the reference point;
 - understand the underlying mathematical system.

4.5 Summary

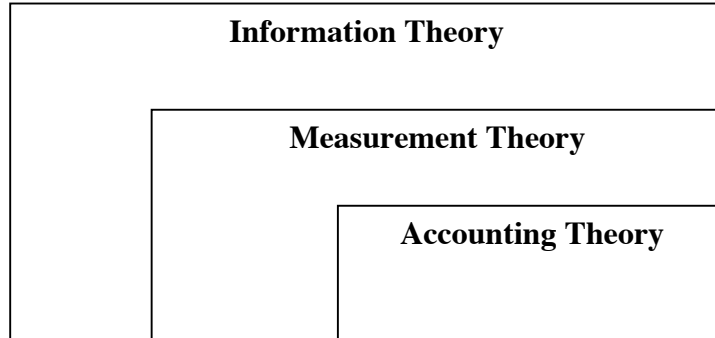
(90) In sum, as we develop criteria for differentiating among different measurement approaches, we must keep in mind:

- That measurement pertains to a “property” of an object or system, not to the object or system itself. To understand the meaning of a measure, it is important to be clear about what it is, and is not, measuring.
- That all *value* measures are “relative” to a particular perspective, whether or not that perspective is explicit. To comprehend the significant of any quantification of value, it is essential to:
 - be aware of the object and properties being measured;
 - be aware of the perspective; and
 - understand the underlying mathematical system.
- That all *performance* measures are “relative” to one or more reference points, whether or not these are explicit. To comprehend the significant of any quantification of performance, it is therefore essential to:
 - be aware of the object and properties being measured;
 - be aware of the reference point; and
 - understand the underlying mathematical system.

5. Measurement Criteria

5.1 Principal Source of Criteria

- (91) The criteria analysis in this paper builds on the analysis of measurement theory, information theory, and accounting theory included in the FEE paper referred to in Section 3, of which an extract is included in Technical Appendix B. Although the FEE paper had different objectives than this one, it provides a highly relevant overview and synthesis of fundamental theoretical concepts.
- (92) One can think of information, measurement, and accounting theory as being related as follows:



- (93) The FEE paper includes an extensive analysis of, and ultimately a synthesis of criteria emerging from information, measurement and accounting theory.
- (94) In order to adapt the analysis in the FEE paper to profiling measurement approaches, some relevant distinctions must be made.
- (95) The first is to differentiate between criteria for assessing measures, and criteria for assessing measurement systems or approaches. A measurement system may incorporate various types of measures: necessarily, then, the criteria used to profile a measurement approach or system will be somewhat more general, or operate at a higher level, than the criteria that would be applied to individual specific measures.
- (96) A second distinction is to differentiate between criteria that would be applied to assess a specific instance of a measure or measurement approach, and criteria that would be applied to assess the measurement approach as an approach. In this paper, we will refer to the former as “evaluation criteria”, and the latter as “profiling criteria”.
- (97) In an assurance engagement, an auditor applies “evaluation criteria” to assess the specific subject matter of the engagement. The auditor provides an opinion on a specific instance of financial statements – for example, the financial statements of XYZ Corporation for the year ended December 31, 2004 – not on the general class of financial statements as a measurement approach.
- (98) By contrast, the focus of this paper is to suggest criteria that could be applied to profile a measurement approach as an approach, in comparison with other approaches.
- (99) To illustrate further, the issue that concerns us here is not whether a particular instance of a measurement approach demonstrates a certain “bias” (to cite one criterion of interest), but rather whether all instances of a specific measurement approach are biased because of something inherent in the approach itself.
- (100) As a result of these two distinctions, the approach followed here is not to attempt to incorporate all of the criteria described in the FEE paper, but rather to select from and adapt those criteria that could be usefully applied to profile measurement approaches, as well as to suggest additional criteria that may be relevant.
- (101) Building on this background material, this section sets out to answer the questions:

1. What is the minimum set of “profiling criteria” that can be used to authoritatively describe the similarities and differences between one measurement approach and another?
2. How can such criteria be organized into an overall model that can be applied to generate a “profile” for a measurement approach in relation to the criteria.

5.2 Context

- (102) To begin with, there are three contextual overarching criteria that should be considered at the outset in classifying a measurement approach:
- Who are the users?
 - Why do they want to use the measurement approach: in other words, what purposes does it serve?
 - What does the approach actually measure?

Let us consider each in more detail.

Who are the “users” of the measurement approach?

- (103) Users can potentially be classified first by differentiating among those who are internal to the organization (e.g., employees), versus those who are outside the organization (e.g., external stakeholders), versus those who sit at the interface between external and internal (e.g., Board of Directors).
- (104) Internal users can be subdivided into:
- Operational staff;
 - Operational management;
 - Executive management.
- (105) External users can be subdivided into:
- Those who have an existing relationship with the organization as:
 - Owners or members;
 - Customers or the equivalent;
 - Suppliers or business partners.
 - Those who are affected by the organization’s actions (members of society);
 - Those who may use measurement information in the process of decision whether to enter into a relationship with the organization in future.
- (106) A further differentiation can be made among:
- Users who simply are the recipients of measurement information;
 - Users who provide key inputs;
 - Users who plan and management the administration of a measurement approach.

What are the purposes of the measurement approach: in other words, why do users use it, or why should they want to use it?

- (107) The purposes of a measurement approach may be classified by determining:
- Whether the measurement approach plays a role in the day-to-day operations or transactions of the organization, or whether its function is related more to management;
 - Whether the measurement approach influences decisions, and if so, what sort of decisions:

- Decisions of internal users (management decisions) versus external users (e.g., investment decisions)
- In the case of management decisions, one can differentiate among day-to-day routine decisions, versus routine decisions that are made routinely, versus strategic decisions that are made infrequently;
- One can also differentiate among decisions that are normally made by operational staff, operational management, or executive management.
- Whether the emphasis is on quantifying value or quantifying performance.

What does the measurement approach measure: in other words, what are the objects and properties that are the “subject matter” of the measurement approach?

(108) The subject matter of a measurement approach can be classified with respect to:

- Whether the principal objects / properties being measured relate to:
 - Financial transactions of the organization;
 - Things owned by the organized (such as tangible and some intangible assets);
 - Processes taking place inside or outside the organization;
 - People and entities that are internal to the organization, and/or their relationships to the organization;
 - Value streams in which the organization participates;
 - People and entities that are external to the organization and/or their relationships to the organization;
 - Attributes of the organization itself;
 - Transactions of external parties that relate to the organization (such as those that influence stock price);
 - Events that relate to the organization.
- Whether the units of measure are primarily financial or non-financial;
- Whether the scale of the measurement is primarily numeric or non-numeric;
- Whether the timeframe to which the measures relate is primarily the past or the future.

5.3 Utility of a Measurement Approach

(109) With the foregoing criteria defining the overall context at a high level, let us move on to criteria that can help analyse in more detail the “utility” of a measurement approach, which broadly relates to what it can be used to measure.

(110) The “Utility” criteria are derived from information, measurement, and accounting criteria, as summarized in Technical Appendix B, related to such matters as:

- User information needs
- Valuable information
- Relevance / decision-usefulness (making a difference in a decision)
- User Benefits

Does the main focus of the approach involve quantification related to value, quantification related to performance, or both?

- (111) For example a Balanced Scorecard provides insights into performance, but normally does not measure value. Traditional financial statements measure both value and performance, based, however, principally on financial transactions.

To the extent an approach quantifies value, what are the principal parameters of the approach?

- (112) What are the objects that are or can be measured using this approach:

- Financial transactions of the organization;
- Assets of the organization, tangible and intangible;
- Entities or units of the organization;
- Value streams in which the organization participates;
- Relationships between people or entities and the organization.
- Transactions of external parties that relate to the organization;

- (113) What is or are the principal perspective(s) from which value is quantified?

- People or entities internal to the organization;
- The organization itself;
- The owners of the organization;
- The market in general;
- Specify potential buyers or sellers;
- Other external stakeholders.

- (114) What are the attributes of the underlying mathematical system used to quantify value?

- Systemic or non-systemic;
- Standards-based or ad-hoc;
- What value concepts are relied upon: for example:
 - Historical cost accounting;
 - Market comparables as used in valuation;
 - Discounting of potential future cash flows;
 - Strategic value based on market or competitive analysis.

To the extent an approach quantifies performance, what are the principal parameters of the approach?

- (115) What are the objects / properties that are or can be measured using this approach:

- Processes internal to the organization;
- People internal to the organization;
- Entities internal to the organization;
- The organization itself;
- External processes in which the organization participates;

- External relationships of the organization.
- (116) What is or are the principal reference point(s) in relation to which performance is quantified?
- Previous performance;
 - Performance goals or targets;
 - Performance of peer organizations or competitors;
 - Performance related to stakeholder expectations;
 - Performance related to defined standards;
- (117) What are the attributes of the underlying mathematical system used to quantify performance?
- Systemic or non-systemic;
 - Standards-based or ad-hoc;
 - Absolute or relative;
 - Measurement scale.

Comparability: To what extent is it possible to use measures generated by the approach to do value or performance comparisons?

- (118) What types of comparisons does the approach enable?
- Internal comparisons
 - Prior periods
 - Targets
 - External comparisons with peers or competitors
 - Benchmarking

Extensibility: To what extent can the measurement approach be adapted for broader purposes?

- (119) Extensibility can be assessed based on the following factors:
- Does the approach have the potential to serve broader purposes than at present? How much development would be required to support this?
 - Could the approach be adapted to measure different objects / properties than at present?
 - What are the existing inherent limitations of the approach, and to what extent could these be overcome through further development?"
 - Does the approach have an existing or potential role in external corporate reporting?
 - Is there an existing or potential linkage to emerging standards such as XBRL?

5.4 Validity of a Measurement Approach

- (120) The validity of a measurement approach is another key area for comparisons among different approaches. For purposes of this analysis, key aspects of validity that build on the criteria summarized in Appendix B include:
- Construct, content, and criterion-related validity
 - Reliability

Validity in use: From a user perspective, what is the relative validity of the value or performance measures related to the objects / properties being measured?

- (121) At a pragmatic level, a user of a measurement approach may make a number of intuitive “judgement calls” with respect to whether a measurement approach is sufficiently valid for measuring specific categories of objects / properties.
- (122) For instance, a user might intuitively perceive that a measurement approach offers sufficient validity for valuing tangible but not intangible assets; or is sufficiently valid to measure the performance of business entities but not valid if applied to business processes.

Reliability in use: To what extent are users prepared to trust the results of the measurement approach sufficiently as to make decisions based on the measures?

- (123) A user may also make a judgement call with respect to the types of decisions he or she is prepared to make based on the measurement approach, also taking into account the extent of corroborating evidence that is available.

Technical validity

- (124) At a technical level, there are three key aspects of validity for any measure:
1. Does a measure accurately reflect the underlying concepts of theory (if any) on which it is based? (referred to as “construct validity”).
 2. Does a measure actually measure what it purports to measure? (referred to as “content validity”).
 3. Does a measure provide a satisfactory amount of feedback information (looking backward), or predicative information (looking ahead), and what is the “shelf-life” of the measure: in other words, for how long is the information still valid or useful. (referred to as “criterion-related validity”).

Technical reliability

- (125) At a technical reliability has two major aspects:
1. Accuracy: does the measure offer a satisfactory level of accuracy, free from systemic error or bias;
 2. Precision: does the measure offer a satisfactory level of precision, free from random error or bias.
- (126) The units of measure and scale are related to both accuracy and precision. For instance, if the measurement scale is not sufficiently granular, this may limit accuracy, precision, or both.

5.6 Practicality of a Measurement Approach

- (127) Building on relevant criteria outlined in Technical Appendix C, the practicality of a measurement can be assessed in relation to criteria such as the following:
- Absolute and relative benefits as perceived by users
 - Absolute and relative costs
 - Short and long-term resource requirements
 - Availability of inputs
 - Appropriateness of outputs
 - Characteristics of users that are essential to make effective use of the measures
 - Inherent characteristics of the information on which the measures are based.

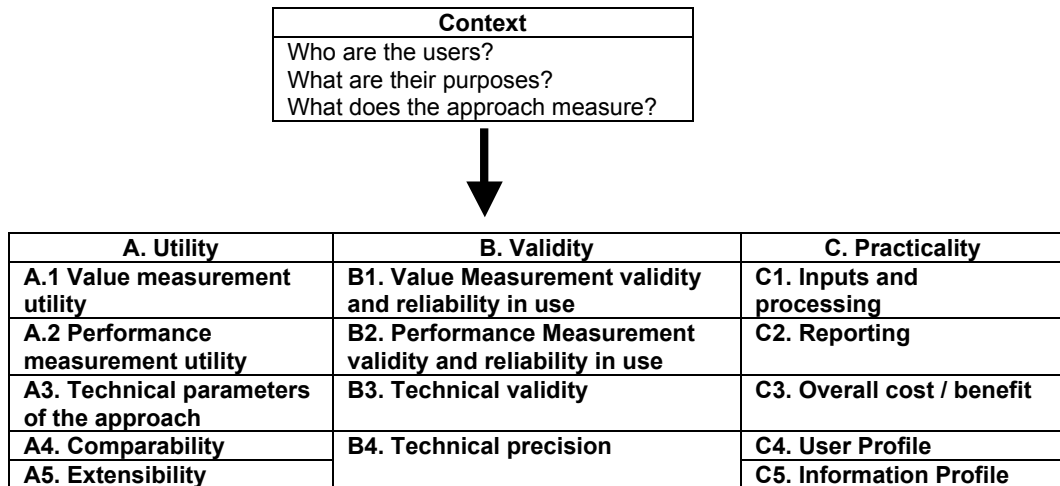
6. Profiling Measurement Approaches

6.1 Introduction to VMRC's online system for profiling measurement approaches

- (128) In order to be of practical use, the concepts and criteria outlined in Sections 4 and 5 need to be embedded in a system that:
- enables comparisons to be made between and among various measurement approaches; and
 - can portray the results of these comparisons in an accessible manner.
- (129) In many cases, assessing a measurement approach in relation to these concepts and criteria is a matter of opinion, and opinions may differ depending on whether the assessor is a user of the measurement approach, or was involved in developing the approach, or has experience as a practitioner.
- (130) This section provides a brief introduction to the online system VMRC has developed that enables participants in the New Paradigm Initiative to contribute their views on how various measurement approaches address the criteria described in the previous section.

6.2 Comprehensive Profiling Framework

- (131) The concepts and criteria described in Sections 4 and 5 are reflected in the following Profiling Framework.



6.3 Perspectives for profiling measurement approaches

- (132) In order to obtain meaningful and useful results, it is important to capture profiling information from various perspectives.
- (133) The innovators or developers of a particular measurement approach may have certain objectives in mind in developing the approach. Their assessment of an approach relative to specific criteria might therefore reflect their design objectives.
- (134) On the other hand, the users of the measurement information provided through a specific approach are likely to reflect their actual experience in assessing an approach relative to the same criteria.
- (135) Practitioners who are involved in implementing the approach are likely to bring another perspective to bear, since they will have been involved in making the compromises and adjustments that are inevitable in translating theory into practice.

- (136) A fourth perspective might be that of measurement experts who can draw on a depth of technical expertise in assessing a broad range of measurement approaches.
- (137) VMRC's online system for profiling measurement approaches invites participants to first categorize themselves as:
- A User;
 - A practitioner;
 - An inventor or developer; or
 - A technical expert or measurement researcher.
- (138) This distinction has three practical consequences.
- (139) First, participants in the User category have the option to select a subset of the Profiling Framework that excludes the more detailed technical criteria. The User framework is as follows:

A. Utility	B. Validity	C. Practicality
A.1 Value measurement utility	B1. Value Measurement validity and reliability in use	C1. Inputs and processing
A.2 Performance measurement utility	B2. Performance Measurement validity and reliability in use	C3. Reporting
		C3. Overall cost / benefit

- (140) Secondly, the wording of the language ladders, as described below, differs for the various perspectives.
- (141) Thirdly, capturing different opinions in this manner enables comparisons to be made across the different perspectives. For instance, it is possible to compare how user experience with a particular approach relates to the design objectives of the innovator of the approach.

6.4 How measurement approaches are assessed

- (142) 1. Each "cell" in the above framework contains a number of "factors" that in total encapsulate the relevant criteria for the cell.
- (143) For example, here are the factors related to cell **A1: Value Measurement Utility**

A1.1 Value measurement of tangible / intangible assets A1.2 Value measurement of past/future value streams A1.3 Value measurement of business units/enterprises A2.4 Value measurement from enterprise perspective A2.5 Value measurement from market/buyer perspective A2.6 Value measurement from external stakeholder perspective

- (144) 2. Each factor has associated with it a "language ladder" that typically describes 4 locations along a continuum. NPI participants are invited to select the statement that best corresponds to the positioning of the measurement approach relative to the continuum.
- (145) For example, here is the language ladder related to factor **A1.1 Value measurement of tangible / intangible assets**, reflecting an *Inventor Perspective*.

<p>A. The approach is not designed to quantify value related to specific assets;</p> <p>B. The approach is designed to quantify value, according to some value concept, related to a tangible assets, but is not intended to quantify value related to intangible assets.</p> <p>C. The approach is designed to quantify value, according to some value concept, related to intangible assets, but is not designed to quantify value related to tangible assets.</p>
--

D. The approach is designed to quantify value, according to some value concept, related to both tangible and intangible assets.

(146) From a *User perspective*, the statements read as follows:

- A. The approach is useful for quantifying value related to specific assets;
- B. The approach is useful for quantifying value, according to some value concept, related to a tangible assets, but is not useful for quantifying value related to intangible assets.
- C. The approach is useful for quantifying value, according to some value concept, related to intangible assets, but is not useful for quantifying value related to tangible assets.
- D. The approach is useful for quantifying value, according to some value concept, related to both tangible and intangible assets.

(147) 3. Reflecting the fact that most measurement approaches are not static and that innovation and development is continuing, participants are invited to make 3 selections with respect to each lanaguage ladder:

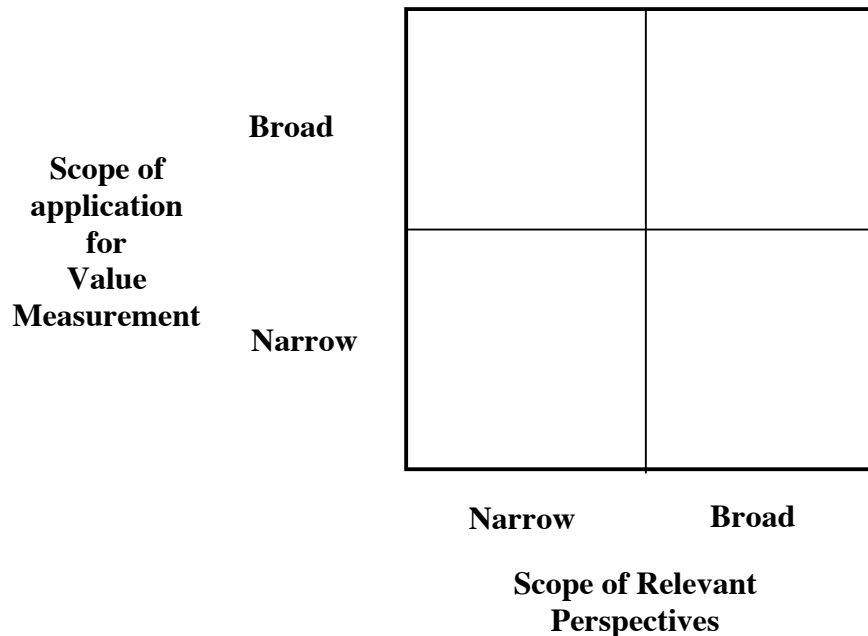
- The statement that best reflects the current situation (Current);
- The statement that best reflects the desired situation in the short-term (Short-term Target);
- The statement that best reflects the desired situation in the long-run (Long-term Target).

(148) These perspectives may provide highly useful feedback to both innovators and practitioners.

6.5 Reporting

(149) Related to each of the 15 cells in the above framework is a chart in the form of a “2 X 2 matrix”. Based on the responses to the language ladders for each factor in the cell, we can generate a composition position for each measurement approach in the “2 X 2 matrix”. (The way this works is by linking each individual factor to one or both of the axes of the matrix.)

(150) For example, here is the “2 X 2 matrix” corresponding to cell **A.1 Value measurement utility**



- (151) Participants are able to select from a number of reporting options, which in turn determine which subset of assessments are mapped onto the charts. Reports are available both online and as downloadable documents in Portable Digital Format (pdf).
- (152) Sample reports illustrating the above points are available as described in Appendix B.

6.6 Initial phase of online profiling

- (153) In order to move forward, rather than begin to profile all of new measurement approaches (such as those listed in Appendix A), VMRC has selected a subset of approaches to be profiled in the initial round. The subset chosen is as follows, although this may be expanded based on the preferences of the initial round participants.

Approach	Innovators / Exemplars	What it is	How it works
Intangibles			
IP Valuation	Business valuers	Method for estimating the value of intangible assets using a conventional valuation approach	Conventional tangibles valuation approach applied to intangibles, using the market, cost, or income valuation methods.
IP Score®	Danish Patent Office	Software that incorporates a method for valuing patents	Uses a set of qualitative inputs combined with basic financial data to project a Net Present Value for individual patents, which can be aggregated into an overall portfolio value, along with related analytics. (Details at www.ipscore.dk)
Indicators			
Balanced Scorecard	Kaplan, Norton	Framework for measuring organizational performance	Develops a framework of 20-30 metrics for tracking performance in four categories (financial, customer, internal processes, learning and growth) linked to strategy and related objectives. (Details at www.bscol.com)
Market Cap			
Future Value Management™	Accenture, Burgmann		Market cap is decomposed into cash, value of current operations, and the residual is Future Value. Various analytics are proposed to estimate how various actions could potentially influence the value of this residual in the future.
Capitals			
IC Rating™	Edvinsson, Intellectual Capital.se	Method for valuing intellectual capital / non-financial assets	Proprietary tool based on Edvinsson's work. IC is decomposed into various components, each of which is assessed in relation to Efficiency, Risk, and Renewal. Approximately 250 elements are rated using a scale adapted from

			Standard & Poor, where AAA is “best grade” and D is “worst”. It is not yet clear whether the methodology also generates a financial valuation.
IC Reporting	Danish Ministry of Industry	Method for external reporting on IC	Provides a framework for external reporting on intellectual capital, based on a pilot project involving Danish firms
Value Streams			
Intangibles Value Stream Modelling	Sullivan, McLean, CICA	Method for quantifying the value potential of tradeable intangibles	Models the value streams associated with intangibles taking into account multiple contexts and perspectives.

6.7 Instructions for NPI Participants

- (154) Detailed instructions for users, practitioners, innovators, and technical experts and researchers who wish to participate in the initial round of the measurement profiling process are available on the NPI website, as indicated in Appendix B.

7. Beyond the traditional accounting measurement paradigm

- (155) An online profiling system such as that outlined in Section 6 can be put to a second purpose, beyond its initial implementation as a means of enabling comparisons to be made among measurement approaches using a common profiling framework.
- (156) Once the criteria embedded in the framework have been refined through experience, they can be used to address a different question: that is: What should be the target profile of a measurement system (or systems) that is/are not bounded by the inherent limitations of the traditional accounting paradigm?
- (157) The use of online profiling creates an important opportunity for measurement professionals around the world to participate in the process of addressing this question. It will provide the opportunity to open a debate around critical questions, such as: what should be the objects and properties measured by a measurement system that embodies a new measurement paradigm?
- (158) VMRC intends to facilitate these debates and discussions in the coming months, and will keep all New Paradigm Initiative participants informed as the process unfolds.

Appendix A

Value and Performance Measurement Innovations

The following is an initial compilation of value and performance innovations. The latest version of this compilation will be available on the NPI website.

Method	Category	Innovator(s)
Accounting for the Future (AFTF)	Value streams	Nash
APQC Performance Measurement	Indicators	ACPQ
Balanced Scoreboard	Indicators	Kaplan, Nortron
Brand Valuation	Market cap	Brand Finance
Business IQ	Capitals	Sandvik
Calculated Intangible Value	Intangibles	NCI Research (see Andriessen)
Celemi Monitor	Capitals	Celemi
Citation-weighted patents	Intangibles	B. H. Hall (et al.)
Cognos Scorecards / Dashboards	Indicators	Cognos
Customer Value Management	Capitals	SMS
Customer Value Measurement	Capitals	NTF Group (AU)
Dolphin Navigator	Indicators	IC Community
Economic Value Added	Market Cap	Stern Stewart
Enhanced Business Reporting	Indicators	AICPA
Enterprise Capital Model	Capitals	St. Onge, Armstrong
Future Value Management	Market cap	Burgmann, Accenture
Global Reporting Initiative	Indicators	GRI
Hermes Principles	Market cap, Value Streams	Hermes Pensions Management Limited
Holistic Value Approach	Capitals	Roos
Human Resource Accounting	Capitals	Various
Human Capital Index	Capitals	Watson Wyatt
Inclusive Value Methodology	Intangibles	M'Pherson
Inside Out	Intangibles	ICAEW
Intangible Assets Monitor	Intangibles	Sveiby
Intangibles Scoreboard	Intangibles	Lev
Intangibles Valuation	Intangibles	Sullivan
Intangible Value Framework	Intangibles	Allee
Intangibles Value Stream Modelling	Value Streams	Sullivan, McLean
IC Evaluation	Capitals	Celemi
IC Monitor	Capitals	Nordic Industrial Fund
IC Rating	Capitals	Intellectual Capital Sweden
IC Reporting	Capitals	Denmark Ministry of Industry
Intellectual Capital Audit	Capitals	Brookings
Intellectual Capital Benchmarking System	Capitals	Viedma
Intellectual Capital Dynamic Value	Intangibles	Bounfour
Intellectual Capital Monitor	Capitals	Stam
Intellectual Capital Report	Capitals	MERITUM project
Intellectual Capital Statement	Capitals	Mouritsen
IPM Benchmarking	Capitals	Sullivan, McLean, McCullough
IP Score	Intangibles	Danish Patent Office
Investor Assigned Market Value	Market cap	Standfield
Invisible Balance Sheet	Capitals	Sveiby
iValuing Factor	Intangibles	Standfield

Intellectual Capital Index	Capitals	Roos et al.
Jenkins Report	Indicators	AICPA
Key Performance Indicators	Indicators	KPMG (Bray)
Konrad Group	Indicators, Capitals	Konrad Group
Knowledge Audit Cycle	Capitals	Marr, Schiuma
Knowledge Capital	Market cap	Lev
Market to book ratio	Market Cap	Various
Market Value of Intangibles	Market Cap	Sveiby
MD&A Guidelines	Indicators	CICA
Measures that Matter	Indicators	EYI, Low
Measuring and Accounting Intellectual Capital (MAGIC)	Capitals	EU
MeyerMonitor	Indicators	Meyer Monitor
Patent Assets Monitor	Indicators	Siemens
PatentValuePredictor	Intangibles	Patent Value Predictor
Performance Prism	Indicators	Cranfield School of Management, Accenture
PBViews	Indicators	PerformanceSoft
QRP Scorecard	Indicators	QRP
Real options	Value streams	PL-X Systems (and others)
SAP Value Measurements	Indicators	SAP
Shareholder Value Measurement	Market cap	Various (see CICA)
Skandia Navigator	Capitals	Edvinsson
Social Responsibility Reporting	Capitals	Various
Stakeholder Accounts	Indicators	Denmark
Sustainability Reporting	Indicators	Various
Sustainability Value Measurement	Indicators	Ekos
Technology Factor	Intangibles	Dow, A.D. Little
Tobin's Q	Market cap	Tobin
Tomorrow's Company	Indicators	RSA London
Total Value Creation	Value Streams	Anderson, McLean
21 st Century Annual Report	Indicators	ICAEW
Unseen Wealth	Intangibles	Brookings Institution
Value-added Intellectual Coefficient	Intangibles	Pulic
Value Chain Scoreboard	Indicators	Lev
Value Creation Index	Value streams	E&Y
Value Dynamics	Intangibles	Libert, Boulton, Samek
Value Explorer	Indicators	KPMG (Andreissen)
Value Extraction	Capitals	ICM Gathering
Value Networks	Capitals	Verna Allee
ValueReporting	Indicators	PWC
Weightless Wealth Toolkit	Intangibles	Andreissen

Appendix B Resources

Please refer to the New Paradigm Initiative website at <http://npi.valuemeasurement.net> for access to additional resources.

In particular:

<http://npi.valuemeasurement.net/concepts.html> provides access to electronic versions of this document, the extract of the Fee Paper, and additional relevant information.

<http://npi.valuemeasurement.net/profiles.html> provides access to VRMC's measurement profiling system, along with instructions and sample reports.

<http://npi.valuemeasurement.net/participate.html> provides information about how to participate in the New Paradigm Initiative;

<http://npi.valuemeasurement.net/documents/html> provides access to additional relevant documents, website links, and other information.