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***IMPROVEMENT OF GLOBAL PERFORMANCE MEASURES  
RELATED TO INTANGIBLE ASSETS***

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## **ABSTRACT**

Global reporting practices will eventually change as the dominance of intangible assets is increasingly dominating organizations most valuable commodities. Yet, the general consensus seems to be that before any real progress can be made in the area of converging performance measures with financial information, the international standard setters need more active participation regarding the depiction of intangible assets metrics. This research article suggests that knowledge value added (KVA) metrics may assist standard setters and market participants in providing for more transparency in an organization's operations. While the accounting standards used must be high quality, they must be supported by intangible measures performance metrics that ensures that the standards are rigorously interpreted and applied, and that issues and problematic practices are identified and resolved in a timely fashion. KVA can partially address these issues.

## **Introduction**

Globalization of reporting standards is increasingly becoming the norm for companies highlighting its financing, investing and business operations (Herdman, 2002). Yet due to the magnitude of influence by international regulatory reporting agencies, there is still much to do regarding reporting organizations intangible assets. That is, intangible assets for the modern day information-technology organization are viewed as the engine of its productive and profitable operations (Pavlou, Housel, Rodgers, and Jansen, 2005). What is missing from global organizations reporting practices are those intangible assets that generate cash flow. The measurement and valuation of intangible assets may provide useful information regarding an organization's global operations. For example, organizations such as telecommunication enterprises have large intangible asset values, and their market share price fluctuates more than companies with more tangible assets (Rodgers, 2003).

Further, auditors, bankers, investment bankers, regulatory agencies, and insurance companies require a valuation of intangible assets in order to assess the viability and durability of an organization. For example, investment bankers, as a group, view an organization value in three parts. First, is the strategic fit with the policy and objectives of the investment banking entity. Second, the calculated financial valuation is considered from the net present value of the discounted (future) cash flow. Third, a subjective evaluation is performed of a variety of so-called soft factors that represent the likelihood that the organization will be able to deliver the forecasts. This evaluation component is

deemed to be between 20-60% of the total market value of an organization (Rodgers, 2003).

This research paper is motivated by the third component of capturing the organization's intangible assets that can be between 20-60% of its total market valuation. Therefore, a method of capturing and reporting intangible assets values to creditors and investors is presented that can be implemented from an international perspective. This performance measure method is called "knowledge value added" (KVA) and this paper highlights how it can help standardized international reporting standards from an organization's operating, investing and financing activities. KVA generates a useful ratio that allocates revenue to the IR required to produce all the firm's outputs. The revenue allocated to intangible assets is the numerator and the cost to use the intangible assets is the denominator. Just as historical financial return based ratios can be used for benchmarking and projecting future firm performance, ROK can be used in the same way (Pavlou, Housel, Rodgers, and Jansen, 2005).

The next section relates to the importance of performance measures related to operating, investing and financing activities of an organization performance as depicted by liquidity, profitability and leverage indicators. This is followed by a discussion of KVA along with examples. Finally, we conclude with implications and a discussion on how KVA may provide useful information on the standardization of important intangible assets metrics.

## **Importance of International Measures of Performance**

As globalization works its way through local economies as a product of deregulation and recent market reforms, there is a need for the union of financial reporting standards with a platform for reporting intangible assets. However, in order to achieve greater transparency worldwide as part of a wider financial reporting apparatus, fundamental measures of performance depicting organizations' productivity and profitability must be put in place before the convergence becomes effective. In addition, the new performance metrics would need to embrace non-financial measures of effectiveness to provide organizations the basis to report on their social responsibility activities, while limiting the disclosure of financially sensitive corporate information.

The latest developments in global commerce are likely to lead to an added wave in deregulation and market reforms in local economies. The demands for capital of growing businesses from the major capital markets of the world are partly dependent on the union of local financial reporting with measures of performance for intangible assets. More plainly, those seeking to raise funds will need to have their adoption of global performance measures for intangible assets converge with reporting standards of the dominant capital market of the world. The establishment of global financial accounting standards alone is not sufficient to achieve the type of regional business growth that we may expect. However, the convergence of a worldwide performance measures for intangible assets with that of global financial accounting standards, will be of tremendous significance to effective capital flows.

## **Corporate Governance**

The term "corporate governance" as it relates to intangible assets refers to the processes and structure of an organization infrastructure are directed and managed, in order to enhance long-term shareholder value through improving performance and accountability, at the same time as taking the interests of other stakeholders (Rodgers and Gago, 2003).

Elements of this infrastructure include: effective, independent and high quality accounting and auditing standard setters; high quality auditing standards; audit firms with effective quality controls worldwide; profession wide quality assurance; and active regulatory oversight.

A constructive first step in creating or reforming the corporate governance system is to view the principles laid out by the Organization for Economic Development and Cooperation (OECD) and adopted by its government members (OECD, 2004). These include: the rights of shareholders; the equitable treatment of shareholders; the role of stakeholders in corporate governance; disclosure and transparency; and the responsibilities of the board of directors. The guidelines provide a great deal of detail about the functions of the board in protecting the company, its shareholders, and its stakeholders. These include concerns about corporate strategy, risk, executive compensation and performance, as well as accounting and reporting systems. The need to adopt an effective corporate governance code is essential as we confront the waves of globalization. Developing a bona fide system of measuring and reporting intangible assets on a consistent and comparable basis can arrest some of the dominant issues related to corporate governance. In part, a restoration of public confidence in the quality

of financial reporting and auditing is tied to the identification, measurement and reporting of intangible assets.

### **Liquidity, profitability and risk**

Efforts by the international community reflect a growing recognition that sound accounting policies and meaningful public disclosure by banking and other financial organizations and by non-banking organizations can improve market discipline. With sufficient, accurate, and relevant information, market participants can better evaluate counter-party risks and adjust the availability and pricing of funds to promote better allocation of financial resources. Thus, more-effective market discipline can, in a way, "regulate" the risk-taking activities of banks and other organizations in ways that can harmonize supervision and regulation of financial institutions and cultivate more secure financial markets. The quality of management information and supervisory and financial reporting is dramatically affected by the identification, measurement and valuation of intangible assets. Sound supervisory and financial reporting; good internal controls, and quality audits are becoming more important to regulators because they directly affect their ability to promptly identify institutions in distress and work toward a satisfactory resolution. Likewise, external audits performed in accordance with high-quality global performance measures of intangible assets can ensure that financial statements are reliable, transparent, and useful to the marketplace, thus enhancing market confidence. The next section highlights the importance of financial ratio analysis and its components.



We follow by explaining the how KVA incorporates intangible assets while assisting in a better interpretation of financial ratios.

Financial ratio analysis is the calculation and comparison of ratios that are derived from the information in a company's financial statements. The level and historical trends of these ratios can be used to make inferences about a company's financial condition, its operations and attractiveness as an investment.

Financial ratios are calculated from one or more pieces of information from a company's financial statements. For example, the "current ratio" is current assets (e.g., assets converted within one year to cash) divided by the current liabilities (e.g., liabilities paid by cash within one year) of an organization, expressed in percentage terms. In isolation, a financial ratio is a useless piece of information. In perspective, however, a financial ratio can give a financial analyst an excellent picture of an organization's situation and the trends that are developing.

A ratio gains utility by comparison to other data and standards. Taking our example, a current ratio for a company of 0.70 is meaningless by itself. If we know that this organization's competitors have current ratios of 0.60, we know that it is more liquid than its industry peers that are quite favorable. If we also know that the historical trend is upwards, for example, it has been increasing steadily for the last few years, this would also be a favorable sign that management is implementing effective business policies and strategies.

Financial ratio analysis groups the ratios into categories that tell us about different facets of an organization's finances and operations. An overview of some of the categories of ratios is given below:

**Leverage Ratios**, which show the extent that debt, is used in a company's capital structure.

**Liquidity Ratios**, which give a picture of a company's short-term financial situation or solvency.

**Operational Ratios**, which use turnover measures to show how efficient a company, is in its operations and use of assets.

**Profitability Ratios**, which use margin analysis and show the return on sales and capital employed.

**Solvency Ratios**, which give a picture of a company's ability to generate cash flow and pay it financial obligations.

Knowledge Value-Added (KVA), a knowledge management theory, provides a way of calculating the aggregate amount of knowledge embedded in an organization in terms of one common unit. Using a ratio, Return on Knowledge (ROK), we can gain insight as to the return or value-added of the investment in the processes that create value, “One may assume that there is a direct relationship between knowledge and the value it creates.” (Housel and Bell, 2001: Ch. 3, p. 21) By defining the knowledge unit, we can use that measure for creating a benchmark of comparison with industries and individual companies. Also, managers on a sub-aggregate level (e.g., leverage, liquidity operational, profitability, and solvency ratios) to determine the most efficient way to allocate revenues back to the processes that add the most value can use it. Once managers understand the productive capability of their organization, they can set about proving their claims about its market value to investors. KVA may be an essential tool

for a knowledge-based organization where financial statements cannot provide meaningful data about intangibles. There are limitations to the ability to make a completely accurate estimation, however the unit of measurement will be standard, providing a solid basis for analysis.

### **KVA Methodology**

Knowledge is located within an organization in three main areas: employees, information technology, and core processes (Housel and Kanevsky, 1995). In order to pinpoint the elusive meaning of “intangible assets,” KVA enables managers to examine which of the company’s core processes will provide the greatest return on the knowledge and helps them decide how to leverage those crucial assets (Housel and Bell, 2001).

One way to look at it is with an analogy of the human body. Human beings contain both muscle tissue and fat. If we imagine an organization as a human structure, then our efficient processes will be our “muscle” and our inefficient, or lesser contributions to end profitability, will be the “fat”. Our “food” intake may be the knowledge it takes to keep the body running smoothly and effectively, and it must be “burned” with the hope of gaining more muscle tissue, and therefore more efficient use of that knowledge. Still, both muscle and fat are needed to make an organization stable, so part of management’s challenge is to find an appropriate balance.

In order to quantify the contribution of these intangible assets, we must find a common unit of analysis that will enable us to benchmark and to objectively analyze the strengths and weaknesses. Our objective is to know how much value each core process adds, and thereby “track the investment required to convert knowledge into bottom line value.” (Housel and Kanevsky, 1995).

Each core process produces a certain amount of change from the initial input to the final output. These changes are the source of the organization's revenue, and the value of this change is determined by the market price, or how much value consumers pay for the output. Since value has been determined to be equal to the total change, and this change is measured by the amount of knowledge, we can connect the dollar amount of profit to the value of the knowledge required to produce that change. This is the premise upon which we build our model to measure the value of each process that contributes to the overall contribution of an organization's leverage, liquidity operational, profitability, and solvency status.

### Underlying Model: Change, Knowledge, and Value are Proportionate



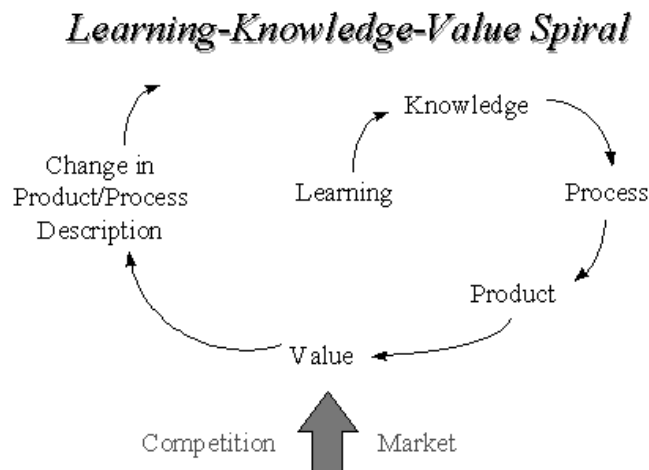
$$P(X) = Y$$

Fundamental assumptions:

1. If  $X = Y$  no value has been added.
2. "value"  $\propto$  "change"
3. "change" can be measured by the amount of knowledge required to make the change.  
So "value"  $\propto$  "change"  $\propto$  "amount of knowledge required to make the change"  
(Principle of replication)

It is important to note that only the changes that produce some form of revenue are considered to contain value. Simply adding "knowledge" to a process may not create

any value for the end consumer and should be re-evaluated. The Learning-Knowledge-Value cycle must spiral upwards to create a positive return.



Knowledge is embedded in a process through learning, and the result of this can be new products and services to create more value for the consumer. This will be determined by the market price, reflecting external factors such as industry competition and technological changes. To ensure that the knowledge investment is producing a positive return, we can refer to the ROK, or Return on Knowledge ratio. ROK will measure the revenue/knowledge unit, and allow us to “proportionally allocate purchase price back to all the pieces of knowledge necessary to produce our final products.” (Pavlou, Housel, Rodgers, and Jansen, 2005).

A logical and effective form of knowledge measurement is by “learning time”, or the time it would take for an “average” person to learn each process (Argote, 1999). *Learning* is described as stored information from an individual’s past (Walsh and Ungson, 1991) and shared interpretations of the past (Darr and Kurtzberg, 2000). An

activity that requires 80 months to learn contains significantly more knowledge than an activity that requires only 20 months. Other forms of measuring knowledge are computer code (process description) and a binary query method, however for ease of estimation we have used learning time throughout the analysis.

To conduct a knowledge audit of an organization on the aggregate level, there are several areas to examine. By interviewing the subject matter experts (SMEs) of each core process, we will need to estimate learning time, the percent of automation, and the difficulty of learning each process. In addition, exact figures will be given for the actual training period, number of employees, and the % of revenue and annual expenses of each category. This is a “rough-cut estimate”, however this would be standard across each analysis, and therefore enable us to make educated comparisons (Housel and Bell, 2001: Ch. 7, p.97). This is a template used to help input KVA data:

Core functional areas	Rating in terms of difficulty to learn	Relative Learning Time (total = 100 months)	Actual Average Training Period	Number of employees	Percentage of Automation	Annual Expense	Annual Revenue
Finance (liquidity)							
General Administration (operational)							
Human Resources (operational)							
Marketing (operational)							
Procurement (leverage and solvency)							
Production /Operations (profitability)							

R&D (operational)							
Sales							
<b>TOTALS</b>		<b>100 MONTHS</b>					

Once we determine the value for each core process for liquidity, operational, leverage, solvency and profitability, we can allocate the total revenue and cost. Similarly, this process can be repeated for any of the processes on a sub-aggregate level to determine what aspects of each core process need improvement.

### **Case Studies**

The Knowledge Value Added theory has proven to objectively obtain information about the performance of knowledge assets and provides a means of benchmarking companies within an industry. The industry of eCommerce has provoked overwhelming attention as waves of dot coms have come and gone, leaving venture capitalist, analysts, investors and consumers alike scratching their heads wondering what happened. The amount of IPOs and their offering prices skyrocketed – 71% in 1999 and 57% in 2000 compared to an 11% average from 1980 to 1998 (Fortune, May 14, 2001, Tully). Bill Gross of Idealab spent 800 million in 8 months without a return, and that’s only one of many. (Fortune cover, March 12, 2001)

The first wave of elation has been followed by a wave of despair as dot commers’ dreams fell into the pit of un-profitability and a dwindling venture capital market. Perhaps the question we need to be asking is how did these companies with seemingly no chance of ever turning a profit receive millions upon millions of VC money? And how did these traditionally successful investors make poor decisions when there are financial tools available to adequately project the potential profitability of a company?

Housel and Bell (2001: Ch. 6, p. 12) argued that, “In the new economy, investors need an objective measure for evaluating early stage companies’ abilities to turn knowledge into value.” The price and cost per unit of knowledge are measures that will help in such analysis because knowledge has become a common unit that can be benchmarked across new and mature companies and industries. Further, issues pertaining to corporate governance will become more transparent due to an increased in knowledge of an organizations’ processes and productivities. Three cases provide a context for this problem: Exodus, ABC.com, and XYZ.com. A comparison will be performed for ROK with benchmarked data from the telecommunications industry in order to draw conclusions about the nature of these industries and their potential to deliver positive returns. This will demonstrate the usefulness of KVA in valuing these e-commerce companies as well as show how industry-wide comparisons can be made.

These tables show the actual earnings data for 1999 and the expected earnings for 2000 for Exodus, ABC.com and XYZ.com.

Actual: Y1999	Company		
Measure	Exodus	ABC	XYZ
Knowledge Units	90,045	486.73	806.14
# of Employees	1,710	25	73
Total Revenue	\$ 242,000,000	\$ 4,800,000	\$ 25,500,000
Total Expenses	\$ 367,000,000	\$ 3,250,000	\$ 37,700,000
Price/Knowledge Unit	\$ 2,688	\$ 9,862	\$ 31,632
Cost/Knowledge Unit	\$ 4,076	\$ 6,677	\$ 46,766

<b>Expected: Y 2000</b>	Company		
Measure	Exodus	ABC	XYZ
Knowledge Units	90,045	591.1	1,002.23
# of Employees	1,710	25	73



Total Revenue	N/A	\$ 35,600,000	\$ 72,000,000
Total Expenses	N/A	\$ 33,700,000	\$ 64,930,000
Price/Knowledge Unit	N/A	\$ 60,227	\$ 71,840
Cost/Knowledge Unit	N/A	\$ 57,012	\$ 64,786

The most salient pieces of data in these charts are the Price/Knowledge Unit for ABC and XYZ (i.e., profitability measures). Compared to Exodus' \$2,688/unit, they project that their knowledge per unit will be worth \$57,539 and \$69,152 more, respectively. A partial explanation could relate to Exodus being established since 1994, whereas ABC and XYZ are newly founded and reliant upon venture capital funding.

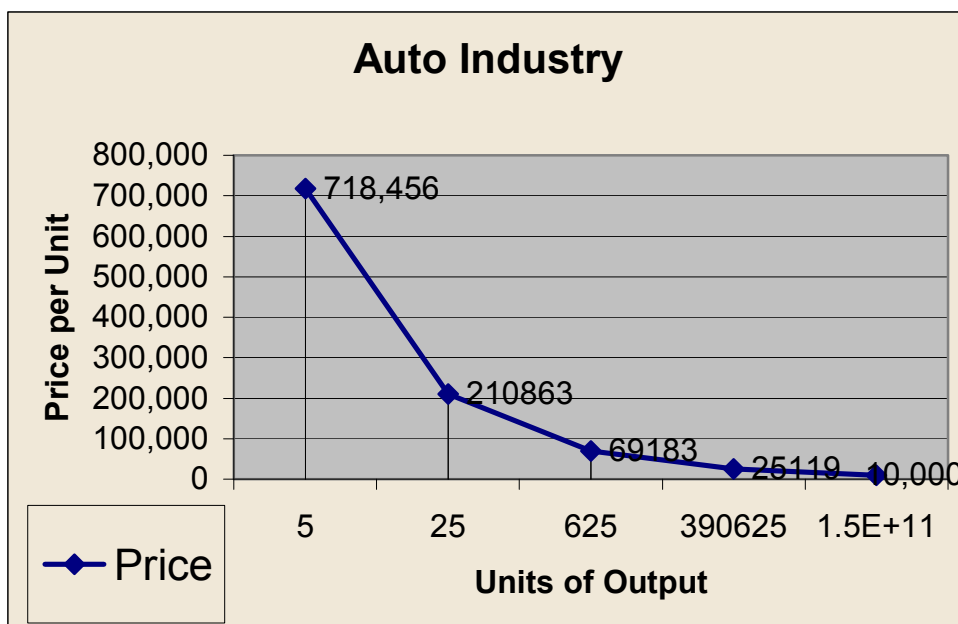
Other profitability as well as operational ratios indicates that the percentage changes in price and cost per unit between actual and expected data are extraordinary. ABC and XYZ project a 511% and 127% increase in price per unit, respectively. Cost per unit projections for ABC was 754% and 39% for XYZ. ABC's cost projection may not be out of line – in fact it is likely in their case that their costs will increase substantially. However XYZ will have to do something different in order to increase the value of their knowledge while their cost increase is substantially smaller. KVA data enables us to compare one industry with another. Here is benchmarked data for the telecommunications industry:

Average Price/Unit	\$ 110
Average Cost/Unit	\$ 70.00
Price Range	\$85 to \$151
Cost Range	\$44 to \$108

The price per unit of knowledge is significantly less than for Exodus, ABC and XYZ. How can these Internet companies be charging so much per knowledge unit (\$2,688 for Exodus, \$9,862 for ABC, and \$31,632 for XYZ)? Is their knowledge really worth that much more? Provided with this information, investment bankers have a starting point of determining if the claims are true. If the price of knowledge is extraordinarily high, managers must be prepared to support it with explanations of the value-added. Hence, these ratios can become a safeguard against false claims and inflated revenue projections.

There are several limitations to consider when comparing these figures. We must acknowledge some of the limitations of the “rough-cut estimate” which lies on the assumption that the knowledge unit per employee will be utilized or “fired” once per year. If this number increases, output will increase and drive the price/unit of knowledge down.

This concept is illustrated with the following analogy of the auto industry. Imagine a car manufacturer such as Ford Motor Co. They currently have 345,991 employees, and their revenue per employee we can assume is very low. If we take a “new entrant” into the auto industry that has, say, 25 people with the same amount of



knowledge units, they will be forced to charge a much higher price per unit.

Therefore, we can only guess how effective the use of knowledge will be at ABC and XYZ. Even so, the nature of their business will only allow them (currently) to employ less than 100 people and this limits the potential to increase output and in turn to reduce the price per unit. Also, an underestimation of the power of automation to be fired more rapidly than the knowledge of employees may also contribute to an inflated price figure.

An investor might be wary of putting down millions of dollars after having seen these figures. Based on option pricing or NPV projections, one might get a different picture of what the future of ABC and XYZ could realistically ever be. Therein lies the value of KVA, for we are able to expose the value claims of the dot com companies. ABC has a revenue model based on third-party advertising, and sustainability has been a great challenge for other companies with a similar business plan as we have recently witnessed. Even Exodus faces a threat to their model, as web hosting has become more and more commoditized and their first-mover advantage is waning. It will be crucial for them to find additional sources of revenue, perhaps by emphasizing their managed and professional services in order to build customer loyalty beyond the basic Internet Data Center services.

The consumer will ultimately determine the value of knowledge reflected by the price per knowledge unit. This is the true test of the value, and all steps taken should be to increase the value of the output toward the consumer. This is why it is necessary for

managers in eCom to continually examine the return on knowledge based on market reactions and to adjust knowledge inputs to maximize the return on investment. In comparison to the option pricing and other traditional methods that value tangible assets, KVA allows for intangible asset valuation, which can be invaluable for those interested in betting their money on a risk filled venture that has but dreams of profitability in the midst of a demanding cash flow.

### **Implications on worldwide global reporting**

More than ever before, current events have clearly confirmed that nations and capital markets of the world are increasingly interdependent. A shock in one area may affect the others. Investors have demonstrated an ever-increasing interest in cross-border investment opportunities, and indeed, technology is making borders disappear. Consequently, we have seen dynamic changes in both domestic and foreign markets. Robert K. Herdman (2002), Chief Accountant, U.S. Securities & Exchange Commission stated, "US holdings of foreign securities stand at approximately \$2.5 trillion, up 7 fold from 1990 and foreign holdings of US securities are approximately \$4 trillion, an increase of almost 340% over the same period. Capital flows to opportunity everywhere, and information - particularly financial information - is the critical currency for investors seeking returns and for companies seeking capital to grow." For example, during the last several years, there has been an increase in the number of German organizations listing in the United States. The shares of some of Germany's most prestigious organizations now trade on U.S. markets. For example, Deutsche Bank, Siemens, Allianz, Daimler-Chrysler, BASF, and Deutsche Telekom.

In addition, the manner in which developing countries respond to the current forces driving globalization will have a major effect on their standard of living, growth rates, quality of life, and development process in the coming decades. In countries where intangible assets organizations dominate over tangible assets based organizations, shifting to a reporting model that captures performance measures of intangible assets may meet less resistance than in countries where those industrial based models are more developed.

Indeed, in countries where corporate and political governance structures are very rigid (typically in conflict or tension-ridden societies), adopting the new business model is likely to be difficult. As a result, these countries may fall even further behind during this wave of globalization than they did during the previous one. Some developing countries are flexible and can adapt quickly, but they may face obstacles instituting changes. In short, whether or not developing countries will benefit or lose from the new business model and its competitive strength remains an open question. It depends largely on how the governments of these countries respond.

The wave of the future is in flexible production and flexible organizations. In that regard, many developing countries should continue to improve the quality of their educational systems and their physical infrastructure (notably telecommunications and transportation), which will enable them to compete more effectively in local and regional markets and, in the case of some industries, in global markets.

## **Conclusion**

Globalization and the advent of new technologies have dramatically changed the way business, government and society are organized. A key driving force of these changes is the transferal from the industrial age to the information age. This information age is a

philosophy of human organization based on conscious teamwork, networking, motivating people and reducing waste, including the cost of under using human capabilities, and to build the infrastructure for the creation of knowledge. Distinctions in the classification between the old and new economy business model may be somewhat artificial, but what is significant is that financial reporting along with performance measures for intangible assets should make the changed relationships and strategic alliance in global organizations more transparent. KVA may provide a timely report card that is understandable to all in both financial and non-financial measures of effectiveness.

## REFERENCES

- Argote, L. (1999). *Organizational learning: Creating, retaining, and transferring knowledge*. Kluwer: Norwell, MA.
- Darr, E. D., and Kurtzberg, T. (2000). An investigation of partner similarity dimensions on knowledge transfer. *Organizational Behavior and Human Decision Processes*, 82, 28-44.
- Herdman, R.K. (2002). Moving Toward the Globalization of Accounting Standards.  
<http://www.sec.gov/news/speech/spch554.htm>
- Housel, T. J. and Bell, A. A. (2001). *Managing and Measuring Knowledge*. Boston: McGraw-Hill.
- Housel, T. J. and Kanevsky, V. A. (1995). Re-Engineering Business Processes: A Complexity Theory Approach to Value Added. *INFOR*, 248-262.
- OECD (2004). Organisation for Economic Co-operation and Development Principles of Corporate Governance. <http://www.oecd.org/dataoecd/32/18/31557724.pdf>
- Pavlou, P. A., Housel T. J., Rodgers, W., and Jansen, E. (2005). Measuring the return on information technology: A knowledge-based approach for revenue allocation at the process and firm level. *Journal of the Association of Information Systems*, 6, 199-226.
- Rodgers W. (2003). Measurement and reporting of knowledge-based assets,” *Journal of Intellectual Capital* 4, 181-190.
- Rodgers W., and Gago, S. (2003). A model capturing ethics and executive compensation. *Journal of Business Ethics*, 48: 189-202.

Walsh, J. P., and Ungson, G. R. (1991). Organizational memory. *Academy of Management Review*, 16, 57-91.