ACCOUNTING FOR DATA: A SHORTCOMING IN ACCOUNTING FOR INTANGIBLE ASSETS

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ABSTRACT

In today's economy and in the future, intellectual capital and the proper use of information will be critical to the success of many firms. Data has been called the raw material of information. Data can be aggregated, disaggregated, sorted, and subjected to a variety of mathematical and logical manipulations. Data can be added to a system, removed, bought, sold and used. Data can be enhanced making it more valuable and it can be made less valuable with repeated use and with the passage of time. Because data is a critical firm resource, one expects the cost of data to be accounted for and to appear on the firm's balance sheet with other firm assets. However, depending on the data's genealogy, the cost of the data may never be shown as an asset.

If data is purchased it finds its way to the balance sheet, however, if the data is developed internally Accounting Principles Board (APB) Opinion No. 17 prevents it from being capitalized as an asset. The authors argue that the exclusion of internally developed assets, (particularly data) from the balance sheet can mislead investors, and managers. The authors believe that the exclusion is unnecessary -- that data meets the definition of an asset. Problems persist in the management of data. The authors believe that placing a value on data and including it in the firm's balance sheet will contribute to management's capability to mange it.

INTRODUCTION

In most twenty-first century firms data is a critical resource. This fact is substantiated by The National Archives & Records Administration study, 2001Cost of Downtime Survey Results (2002). The study reported that ninety-three percent of companies losing their data center for 10 days filed for bankruptcy within one year, and that forty-percent of the companies surveyed reported their survival was at risk if their data center was lost for seventy-two hours. Financial statement users have come to expect critical resources to be represented on a firm's balance sheet as an asset. However, it is very likely that if the critical resource is internally developed data, it will not be reported anywhere on the company's balance sheet or in its financial statements. In fact, stockholders and other financial statement users may be unaware of the data's existence. This exclusion of a critical firm resource from the balance sheet seems to be at conflict with Financial Accounting Standards Board (FASB) Concepts Statement No. 1, "Objectives of Financial Reporting

by Business Enterprises," that states financial reporting should provide information that is useful to present and potential investors and creditors in making rational investment, credit and similar decisions (1978).

Data is a critical firm resource and is just one component of an information system. Data is separable from the information system used to process it. Lawrence (1999, p. 3) defines data as "symbols, images, sounds and ideas that can be encoded, stored and transmitted." More generally, data are facts about an entity when an entity is a person, place or thing. Facts about a customer entity are categorized as attributes of the entity. The attribute of interest may include the customer's name, address, telephone number, age, sex, income, any number of purchasing habits and more. Data are aggregated, disaggregated, sorted, and/or subjected to a variety of mathematical and logical manipulations.

Processed data presented to a user in a meaningful context becomes information. Information is clearly produced from data, making data the raw material in an information manufacturing process (Goodhue, Quillard and Rockart, 1988; Sabherwal and King, 1991; Levitin and Redman, 1998). The value of information is a function of how the information is used and the subsequent outcome. Because information has value, data also has value. Data can be added to a system, removed, bought, sold, and used. Data can be enhanced, making it more valuable, and it can be made less valuable with repeated use and with the passage of time. Data is in fact a critical organizational resource and should be treated as such.

This paper specifically addresses accounting for data and more generally accounting for intangible assets. The paper begins by reviewing the definition of an asset and continues by reviewing the relevant accounting standards. The paper then compares and contrasts the characteristics of data with those of an asset. The paper concludes with the recommendation to account for data as an asset

Several current and past accounting standards discuss the uncertainty of future economic benefits and contribute to the analysis of how we should account for data. The relevant standards are the Concepts Statements by the FASB that relate to the definition of an asset, Accounting for Research and Development Costs, Accounting for Software Development, and Accounting for Intangible Assets.

During the 1970s and 1980s, the FASB issued several concepts statements to guide the development of accounting and reporting principles for use by U.S. companies. At least four of the statements provide insight into our subject.

According to FASB Concepts Statement (SFAC) No. 1, *Objectives of Financial Reporting by Business Enterprises*, the objective of financial reporting is to provide useful information. The characteristics of accounting information that make it useful are identified and discussed in FASB SFAC No. 2, *Qualitative Characteristics of Accounting Information*. The key characteristics Statement No. 2 identifies and discusses are:

1.	benefits of the information disclosure should exceed cost
2.	the information should be relevant
3.	the information should be reliable
4.	the information should be comparable
5.	the information should be material.

SFAC No. 5, *Recognition and Measurement in Financial Statements of Business Enterprises,* states in paragraph 63 that an item should be recognized in a financial statement if it meets the following criteria:

1.	The item meets the definition of an element of financial statements (definition criterion);
2.	The item has a relevant attribute measurable with sufficient reliability (measurability criterion);
3.	Information about the item can make a difference in user decisions (relevance criterion); and
4.	The information pertaining to the item must be representationally faithful, verifiable, and neutral (reliability criterion).

SFAC No. 6, *Elements of Financial Statements,* defines an asset. It states that, "assets are probable future economic benefits obtained or controlled by a particular entity as a result of past transactions or events." The statement continues by identifying three essential characteristics of an asset:

1.	it embodies a probable future economic benefit that involves a capacity to contribute directly or indirectly to future net cash flows,
2.	a particular entity can obtain the benefit and control others' access to it, and
3.	a transaction or event has already occurred that gives the entity the right to, or the control over the benefit.

That an entity be required to have the right to control the benefits the item produces before the organization can record the item as an asset seems straight forward. The most important characteristic of an asset is its capacity to provide future economic benefits that generate net cash inflows. Future economic benefits can be realized through exchanging the asset for something of value, or through use of the asset toward some productive end. A unit of Product X held in finished goods inventory is an asset, because there is a high likelihood that it can be exchanged for currency.

Equipment used to produce Product X, though not held for the express purpose of selling it in the future, is an asset because it is used to manufacture product X. Its productive use in making Product X creates future economic benefits for the owner in the form of revenues produced from the sale of Product X. Raw materials are assets for the same reason as equipment, because they provide future economic benefits in the way of revenues generated from the sale of finished products made from the raw materials. Future economic benefits can also come in the form of more efficient production that will result in decreased cost.

In October 1974, The Financial Accounting Standards Board (FASB) issued Statement of Financial Accounting Standard (SFAS) No. 2, "Accounting for Research and Development Cost." The standard requires all Research and Development cost to be expensed as incurred. Research and development are defined, in part, by paragraph 8 of the standard as follows:

> Research is planned search or critical investigation aimed at discovery of new knowledge with the hope that such knowledge will be useful in developing a new product or service or a new process or technique or in bringing about a significant improvement to an existing product or process. Development is the transition of research findings or other knowledge into a plan or design for a new product or process or for a significant improvement to an existing product or process whether intended for sale or use. It includes the conceptual formulation, design, and testing of product alternatives, construction of prototypes, and the operation of pilot plan.

In the discussion of the reasons research and development costs are required to be expensed, paragraph 45 of the standard states that they fail to satisfy the measurability test for accounting recognition. The measurability criterion will be discussed later in the paper, but requires the future economic benefits of an asset be identified and objectively measured.

In August 1986, the FASB issued SFAS No. 86 to establish standards to account for the costs of computer software to be sold, leased, or otherwise marketed as a separate product or part of a product or process. SFAS No. 86 requires all cost incurred to establish the technological feasibility of a computer software product to be sold, leased or otherwise marketed are research and development cost and should be expensed when incurred. Costs incurred after technological feasibility has been established should be capitalized. The Board required technological feasibility to be established before the costs are capitalized because of the uncertainty of the future economic benefits. FAS No. 86 does not address accounting for the cost of computer software created for internal use because it was not considered a significant problem.

It is noteworthy the definition of an asset does not make reference to physical objects, but rather to future economic benefits. It is the ability of an asset to produce future benefits that is key, not that it is tangible. In fact, many assets are intangible. Intangible assets are generally defined by the FASB as current and noncurrent assets that lack physical substance. The accounting for intangible assets has been the subject of three different standards and has caused much recent controversy.

In 1953, Accounting Research Bulletin (ARB) No. 43 was published by the Committee on Accounting Procedure of the AICPA. ARB 43 discussed accounting for Intangible Assets; however, in the first paragraph it excluded from its consideration the problems of accounting for intangibles developed in the regular course of business. The ARB did state, in paragraph four, that "The initial amount assigned to all types of intangibles should be cost, in accordance with the generally accepted accounting principles that assets should be stated at cost when they are acquired."

In 1970, the Accounting Principles Board (APB), issued Opinion No. 17, "Intangible Assets". Paragraphs 6 and 11 of the Opinion describe Generally Accepted Accounting Principles (GAAP) prior to the Opinion's issuance. Paragraph 11 of the Opinion states, "Costs incurred to develop specifically identifiable intangible assets are often recorded as assets if the periods of expected future benefit are reasonably determinable. Costs of developing other intangible assets are usually recorded as expenses when incurred." Paragraph 15 of the Opinion appraises the procedure by stating that the cost of developing intangible assets with lives that are indeterminate are not distinguishable from current costs of operations and are, therefore, not assignable to specific assets. In paragraph nine, the APB concluded, "that a company should record as assets the costs of intangible assets acquired from others ……. and record as expenses the costs to develop intangible assets which are not specifically identifiable."

APB Opinion No. 17 required intangible assets purchased from others to be capitalized and internally developed intangible assets that were not specifically identifiable to be expensed. The opinion was silent on internally developed intangible assets that were specifically identifiable. However, it became accepted practice in the U.S. to expense all intangible assets that were internally produced as evidenced by the FASB's, *Proposal for a New Agenda Project: Disclosure of Information about Intangible Assets Not Recognized in Financial Statements* (2001) which states:

> Intangible assets are generally recognized only if acquired, either separately or as a part of a business combination. Intangible assets that are generated internally, and some acquired assets that are written off immediately after being acquired, are not reflected in financial statements, and little quantitative or qualitative information about them is reported in the notes to the financial statements.

Many argue that the economy today is fundamentally different from the economy of fifty or even thirty years ago and that traditional financial accounting concepts do not capture the essence of the new economy. It has been argued that the new economy is driven by intellectual capital, or in many instances by intangible assets This movement to a knowledge economy prompted criticism of APB No. 17. This criticism led to the study of the issue and a new accounting standard.

In September 2001, the FASB issued Statement No. 142, "Goodwill and Other Intangible Assets." SFAS No. 142 superceded APB Opinion No. 17 and changed the accounting for some intangibles. The statement does not require the amortization of the intangible asset, but requires an annual test to determine its value. The intangible asset must then be written down to its value.

However, SFAS No. 142 left unchanged the provision in APB No. 17 related to internally developed intangible assets. Paragraph 2 of SFAS No. 142 states:

> This statement supersedes APB Opinion No. 17, Intangible Assets; however, it carries forward without reconsideration the provisions in Opinion 17 related to internally developed intangible assets. The Board did not reconsider those provisions because they were outside the scope of its project on business combinations and acquired intangible assets.

In the FASB Exposure Draft, "Business Combinations and Intangible Assets," an appendix included an extensive list of intangible assets that, if present, should be recognized in a business combination separately from goodwill. Included in that list are: rights, computer software and licenses, computer programs, information systems, program formats, unpatented technology, databases, research and development, lists, and files and records. From the standard and the exposure draft, it is clear that if data is purchased from an outsider, it should be accounted for as an intangible asset according to the rules set forth in SFAS No. 142. What is not clear, is why a purchased asset and an internally developed asset are accounted for differently.

Concepts statements No. 1, 2, 4, and 5 provide guidance on the recognition of an item as an asset in a business enterprise's financial statement by listing the criteria that must be met. Additional guidance can be gleaned from other issued standards. From SFAS No. 2, we see that the future economic benefits provided must be measurable. SFAS No. 86, requires that in developing software for sale, the technological feasibility must be proved before cost can be capitalized. The application of APB Opinion No. 17 prohibited internally developed intangible assets from being capitalized. SFAS No. 142 continued to ignore internally developed intangible assets but requires externally purchased intangibles to be periodically reviewed for value and written down accordingly.

Recognition is the formal process whereby an item is incorporated into the financial statements of a business enterprise. As previously discussed, SFAC No. 5 outlined the four criteria an item must meet to be included in a financial statement as an asset in accordance with generally accepted accounting principles. The four criteria assume that the benefits of including the item exceed the cost of including the item in the financial statements. Data meets all the requirements of SFAC No. 5 to be recognized as an asset in a financial statement.

Recall that an asset is a probable future economic benefit obtained or controlled by an entity as a result of past transactions or events. Given that data are raw materials used in information manufacturing their probable future economic benefits are tied to the value of information which is related to the information's use. Information is not a resource for which we have markets to readily establish an economic value; however, there is little question whether information is valuable.

Whether one subscribes to normative theories of information value, economic theories of information value, or neither, nearly everyone recognizes that information has value (West and Courtney, 1993). Lawrence (1999, p. 7) states, "information produces value for an organization

when it improves the solutions to decision problems whose outcomes are consequential to the organization." Many products are produced without knowing the exact future value (prices) of the products because of the economic characteristics of markets wherein they are sold (i.e. prices are quite uncertain for commodities when production decisions are made). One problem already noted with establishing the value of information is there are not well developed market mechanisms for establishing its value (Stigler, 1961; West and Courtney, 1993, Lawrence, 1999). The uncertainty often inherent in markets and in future prices received for products does not keep firms that produce those products from considering raw materials as inventory, and including the cost of that inventory in the cost of the finished product. Raw material inventory is but one type of inventory that contributes to the inventory value that appears in the asset section of a manufacturing company's balance sheet.

Because one cannot establish with certainty the exact value of information created with data, it does not follow that data are not capable of producing future economic benefits. Data provide future economic benefits. Just as the cost of raw material made its way to the balance sheet, the cost of internally developed data can also make its way to a balance sheet through standard cost accounting procedures.

Another part of the definition criteria is that an asset must arise from a past transaction or event. Whether the firm purchased the data, accumulated the data itself, or some combination of the two, the data is most often owned and is/can be controlled by the firm. In fact, the value of data arises from its use. Today, data management approaches, tools, and techniques make control of company data far more effective than ever before. Firms can, with appropriate data management tools, control access to and the use of data, maintain the data more effectively to be sure the value of the data is maintained or enhanced, and use the data more effectively (as in knowledge management systems, data warehouses, data mining, etc.) to maximize its potential to produce future economic benefits. Although the value of data is directly related to its use and the outcomes of management's decisions, it can and does produce future economic benefits. In addition, data can certainly be obtained and controlled by an entity as a result of past transactions or events. Accordingly, data meets the definition criterion of an asset.

An attribute is measured reliably, if when measured in the same manner repeatedly, it produces identical or nearly identical results. The measure that is applied in placing a value on most assets in organizations is historical cost. Standard cost accounting procedures can produce reliable historical cost figures for data just as they have for many other assets, i.e., inventory and fixed assets. FAS No. 142 also provides a tool with which to value data. Just as one will now evaluate the carrying cost of all intangible assets for impairment of value, data should be evaluated accordingly. Standard cost accounting procedures and a periodic evaluation for impairment of value can result in an asset with a value that is measurable.

Because data is used in decision making the cost of data is relevant. The resources an organization devotes to data management communicate something about the organization to both

external and internal decision makers. The value or cost of data an organization owns may be particularly important to investors in the new knowledge economy. An organization's data can also be used internally to help management better utilize its resources. Most organizations spend money storing, protecting and managing data that is simply not worth their effort. Estimating the costs of data would help internal decision makers make more rational choices about managing the data resource itself and its complementary resources such as data storage. If organizations better understood the costs of data, and could compare those costs to the potential benefits of the data, they might make better decisions about what to acquire, what to maintain, and what to remove from organizational systems. The above points suggest that data costs are important in the context of internal decision making, certainly in the domain of information resource management and data management.

The value of the data asset is also important to those outside an organization attempting to get an accurate picture of the value of an organization, or its propensity to perform now or in the future. For example, suppose the world's number one retailer, were to completely lose all of its retail data for the last 5 years. Would it affect their ability to perform in coming years? Is the data valuable? Would the news of the loss of its data influence investors' perceptions of the company's likely future performance? Would current or potential investors be interested in the cost of re-creating, to the extent possible, that data? Is the cost of the company's data assets important to external as well as internal decision makers? The answer to all the above questions is certainly yes. It takes little imagination to conceive of organizations that would be significantly hampered by the loss of data. Knowledge of an organization's data assets can be valuable and important to investors. It is interesting that an insurance claim to recover losses experienced due to the loss of company data cannot be filed. Insurance companies do not know-how to place a value on the data and so do not insure it (Korzeniowski, 1985; Conry-Murray, 2002). Insurance companies will insure an information system, but they will not insure data; however, data can be lost to such a system with the system itself remaining intact. With the rise of cybercrime, knowing the value of data and being able to insure data is likely more important than ever before.

Today, business networks, or virtual organizations are becoming increasingly common. Would an existing Virtual business have an interest in the data assets possessed by potential partners? Assume one potential partner had significantly more data (quantity) than other potential partners, and that was clear from the dollar values placed on the data assets of all potential partners. Assume, also the potential partners were roughly equal in every other respect including the quality of their respective data assets. The value of the data assets (firm with greatest quantity, given same quality, would have data with greater value) could influence the decision of the Virtual business regarding which firm to select as a partner? We expect this may also be the case in more traditional mergers and acquisitions. Knowledge of the cost of data can be consequential in decision making for internal and external decision-makers, therefore, data costs meet the relevance criterion for recognition as an asset.

Reliable information is verifiable, neutral, and it represents faithfully the value of the phenomenon it supposedly represents. A measure is verifiable to the extent it is based on sound underlying evidence. The evidence, when viewed objectively by competent accountants, would lead them to essentially the same conclusion. Again, we point out that standard cost accounting procedures have been used successfully in the past to produce verifiable, neutral, and representationally faithful measures of phenomenon. Standard cost accounting procedures can be used to cost data. Periodic examinations for impairment of value in accordance with FAS No. 142 will keep the information reliable.

Prior to the issuance of SFAS No. 142, the FASB published a special report in its Financial Accounting Series by Wayne Upton (April, 2001), "Business and Financial Reporting, Challenges from the New Economy." One section (Chapter 4) of Upton's report deals with intangible assets. Upton concluded, "There is no conceptual basis in the definition of an asset for applying different recognition rules to intangible assets purchased from outsiders and the same assets created internally. Different recognition rules, if appropriate, require some other justification." SFAS No. 142 addresses the accounting for purchased data and requires it to be capitalized, but did not consider accounting for internally developed data. Therefore, APB Opinion No. 17, issued over thirty years ago, remains the authoritative source for principles related to accounting for internally produced data.

Many accountants and users of financial statements agree with Upton, in that the genealogy of an intangible asset should be irrelevant to its recognition on a balance sheet. The same rules and definitions should be applied to all intangible assets. The case at hand makes a good argument. Data is in fact an asset and should be accounted for as such whether developed internally or purchased from an outside entity.

CONCLUSION

There is a difference in the accounting for purchased data and internally developed data. The definition of an asset and accounting standards related to data were reviewed herein, only to conclude that differences in how we account for data based on its genealogy is illogical and unnecessary. Internally developed data meets the definition of an asset. The value of data is relevant, and can be adequately measured. Therefore, the accounting profession should be willing to recognize internally developed data as an asset. There is a need for discussion and research into this important area. As we move forward into the information age, data will become more important, not less important. Organizations have, are, and will continue to search for ways to better manage this critical resource. Problems persist in management of the data resource, and measurement is a key to making progress in addressing many of those problems. Placing a value on data and reflecting it in a firm's balance sheet will contribute to management's capability to manage it. Measuring the value of data is a "doable" task, and one that begs attention now.

Stigler, in his often quoted article on the Economics of Information (1961), stated that knowledge is power. Because data is the raw material of information, and information the foundation of knowledge, it follows that data has value. Expanding on Stigler's work, Lawrence (1999) added considerably to the body of knowledge surrounding the economics of information, but has had little impact on the way information is managed in organizations, or the way data is managed. Placing a value on data and presenting it in a firm's balance sheet will surely impact the management of a critical firm resource by holding management accountable for the asset. Excluding the value of data from a firm's balance sheet does not serve management, stockholders or potential stockholders.

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