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Dynamic Monetary Accounting

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Abstract

For this century, financial accounting "technology" has meant double-entry accounting. Computers, once assumed to be infallible, insufficiently automated double-entry with only single-entry records. Transaction logs, audit trails, and other features since have augmented these bookkeeping verification gaps by enabling error discovery and recovery. VisiCalc, later Lotus 1-2-3 and Excel, brought dynamic spreadsheets into widespread use for modeling "what if" thereby bridging the gap between time-fixed ledgers with new flexibility for handling the imaginable. However, even as multinational finance systems, enterprise resource planning, and accounting processes infiltrated every organization, financial accounting technology has not advanced in tandem with business complexities. Consider whether you are able to bridge the gap for multiple currency accounting. converge the accounting of interest bearing assets, or integration from start to finish initial strategic business planning to forensic analysis. If you are, the process is likely to be complex and cumbersome, while disconnected as supplemental steps to core financial operations.

The paradigm shift detailed in this article overcomes the complex and cumbersome. The inherent limitation in evaluating monetary values within the traditional obsolete accounting technology is resolved by this paradigm of the *lowest common denominator* for monetary values. It enables multiple (really unlimited bases at the same time) currency accounting, level consolidation of monetarily-denominated assets (bonds, notes, options, hedges, et cetera), a structure for combining strategic planning with operation results, and any belated forensic reevaluations after events.

If you restructure a static currency value into subordinate characteristics not only do you minimize the potential for errors in standard accounting practices, you also enable all cash-valued assets with any currency basis or time-dependency to be transformed into any other selected basis, visual presentations, and formats. While this new dynamic monetary accounting paradigm is functionally impossible without computerized information technology (IT), the paradigm shift is the only existing method to enable these functions. The paradigm treats different foreign currencies, bank accounts, notes, loans, insurance, and derivative products as similar and comparable assets with a uniform lowest common denominator.

The practical value of this paradigm shift to you is how it augments e-commerce, banking, brokerage, real-estate, global business, and even naturally hedged local businesses. This new paradigm not only

retrofits existing IT operations, it facilitates new types of accounting functions, and integrates cross-border supply chain activities. On a larger scale, it creates derivative or entirely new business opportunities. Go beyond what is, at first look, just a technical computer concept. Realize that dynamic monetary representations integrate standalone processes in many business environments, globalize transactions, provide convergence for disparate business operations, and unify rarified types of accounting procedures into the mainstream.

Static Accounting

The intrinsic limitations in currency representation are not specific to accounting or management finance. You can see a devastating path ripped through many professions, but none so clear as in accounting and automated data processing where everything is money and perceived differences are handled by exception from normal work flow. Specifically, the existing and traditional structure for currency is unnecessarily complex, logically ill-defined, and semantically imprecise. Both the value of the currency, its visual structure, and its currency basis is uniformly defined within a ledger entry, a consolidated rollup, the single currency variable, screen data field, or database field. In effect, while currency has defaulted to generally accepted bases or has been defined as a specialized number format to simplify computer code and report generation, this structure has become outdated and confining because it is *static*. A multidimensional monetary structure with subordinate fields normalizes the compound and now static currency value into separate and simpler characteristics (also known as properties or attributes). This currency definition *expansion* counterintuitively alters the universe of financial processing by *simplifying* the structure of money:

Field	Name	Purpose
1.	Value	real value "inventory" count of currency
2.	Basis	Description of foreign currency or other monetary basis
3.	Date	Transaction date (and sometimes a millisecond time)
4.	Display	Characteristics for localized/internationalized presentation

Figure 1. The expanded characteristics counterintuitively simplify currency.

You might imagine that this new currency definition is perversely more complex. It certainly seems more elaborate. However, the separation of subordinate characteristics makes it possible to extend accounting functionality to where it hasn't gone before. Just as the Greeks and middle age alchemists were constrained by the definition of water as a basic substance until atomists expanded and simplified water into subordinated characteristics of H_2O, accounting has been constrained by overly elaborate view of currency. It is now possible to separate out the value from its representation and unify the denominator so that any monetary-denominated asset can be redenominated by basis or reevaluated over time.

Additional characteristics handle application-specific needs for e-commerce, risk management, reporting consolidation, multinational accounting, financial brokerage, international banking, payroll, strategic management planning, what-if scenarios, petty cash, taxation, tariffs, and trans-national shipping activities. When normalized, a static currency value becomes a *dynamic* entity easily translated into any other format for any other time frame. Conditional states are just a variation on any dynamic translation,

only the translation need not be based on historical, present, or future events, just hypothetical ones. You can see my practical implementations for this paradigm shift with a commercial product like the Currency Conversion Toolkit. It is computer middleware and a data delivery service that immediately globalizes electronic commerce, enhances many aspects of risk management, and systematizes many ad hoc aspects of international banking, brokerage, currency trading, and multinational sales and purchasing.

Dynamic Accounting

Rather than perceiving a currency value as an entity that is already of the simplest and most primitive format—it is categorically not—separate out the numerical "inventory" component, and elaborate the characteristics of the currency into a format with characteristics transferred to subordinate descriptions. You can understand currency as an "inventory" of a specific type of money basis. Technically, this reduces the order of currency to a simpler "normalized" or "canonical" form. From a practical standpoint, this reduction in characteristics to more primitive descriptions does two things. First, it increases the functional accuracy of the monetary value by internalizing the attributes of each currency value. Errors are fewer and multiple currencies can be processed automatically. Second, it separates the value from any fixed basis or display requirements. This allows currency to become an independent entity in the lowest common denominator that can be translated into any currency basis and presented in any acceptable display format.

Traditional monetary representations define monetary value as a singularly defined entity. For example, $1.00 is a $1.00, and it cannot be anything else or even be misunderstood as anything else. That precision has been useful because it does not lend itself to other uses, meanings, and functionality. However, because the structure is rigid, it hampers advanced uses and innovation. Consider that while $1.00 might seem simple, it is a compound abstraction of several characteristics, which are reducible. For example, is that $1.00 U.S., $1.00 Taiwanese, or $1.00 Bahamian? And, for what time is that value valid? Just about all manual and automated procedures view monetary representations in terms of static compound representations/values. So, in other words, while $1.00 is still just a $1.00, 100¥ is also just a 100¥. Nor is there any intrinsic or functional interrelationship between $1.00 and 100¥. Monetary representations without specific definition, for example, 100 (lacking unit description or currency designation), default to valuations implicit by context.

The problem of how to view 100, 1.00, or most formally $1.00 resolves itself when we view it as an inventory of 1 unit of dollar-denominated currency. It is no longer a dollar, but a unit internally defined in dollars, and represented by centenary units. Such an explicit normalization is internally defined and self-sufficient. This simple reduction from a compound definition to a series of minor descriptive characteristics is the breakthrough; everything else becomes possible because of this simplification. The paradigm is not counterintuitive when you get used to the concept; it makes many other things possible, and similarly is critical for business evolution.

A definition of monetary value that previously was static is exchanged for one more useful because it is context-insensitive, internally consistent, flexible, and easily converted into other functional representations. The denominator is of the lowest form so that it can be changed into other more complex formats, even the traditional currency format. One unit, a unit defined in dollars, defined by centenary units, can be transformed into the traditional $1.00. Note that it can also be translated in many other ways too, such as 120¥, €0.93, or £0.88, just specific formats from hundreds of possibilities. Note that these display representations are not as specific as the original structure because time values, the exact currency description, and the inherent translation is no longer attached. Is $1.00 today the same as $1.00

tomorrow? Does conversion between them represent a strategic advantage? Whereas $1.00 is a both a static traditional valuation and representation, under the new paradigm, the valuation becomes intrinsic, separated from any dynamic representations.

In some cases, the traditional currency structure continues to be adequate. Older and newer formats are interchangeable through translation, although the traditional format requires additional explicitly or implicitly provided details to translate into the new canonical format. The normalized canonical format is easily retrofitted to existing applications with a simple data structure change; most application code remains unaffected. The important aspect of this paradigm shift is that the new currency format creates opportunities impossible and impractical with the traditional structure. Specifically, conversions to Euro-based accounting can occur at the storage level rather than recoded for every function throughout an accounting application. By implementing Euro conversion with a dynamic monetary accounting format, not only is the Euro conversion fixed, but every other currency becomes inherently supported at the same time too. Additionally, a dynamic functionality is also established to resolve timing issues in terms of storing, processing, and accounting for interest, depreciation, or other time-sensitive values of money or what-if scenarios. The next illustrations shows the dynamic expansion to four dimensions with currency basis, time value of money, and what if scenarios:

Figure 2. Three new dimensions for monetary values dynamical over basis, time, and planning.

We are exploring the potential for a fifth dimensional usage, that of integrating multiple book operations into a single framework. Specifically, a bookkeeper could layers of depreciation and amortization for business, tax, reporting, 10K filings, and other business planning activities. Similarly, the discrepancies between ongoing business accounting and tax reporting methods could also be reconciled in a similar stacking of layered monetary information.

In addition, the paradigm addresses issues raised by Financial Accounting Standards Board (FASB) as long ago as 1972 and not implemented by standard accounting systems to date. This includes FASB statement 1, 8, 20, 33, 52, 70, 80, 104, 105, 107, 129, and 133 of the 135 statements issued to date. The paradigm provides the structures and tools to address requirements for:

- Disclosures of foreign currency translations
- Accounting for foreign currency transactions
- Accounting for forward contracts
- Accounting for futures contracts
- Accounting for hedging activities
- Accounting for fair value
- Accounting for complex derivatives
- Standard accounting for off-balance sheet risks and instruments
- Adjusting and planning for inflationary (or deflationary) markets
- Accounting for constant purchasing power
- Reporting changing prices and bases

Practical Uses

The paradigm is practical, shown by these real world examples. You can create multidivisional or multi-country corporate 10Q and 10K reports with full currency conversion and rollups in any currency display for printing or automatic Internet delivery. You can use language conversion software to convert the text of the report into other languages too for a localized meaning. A French investor evaluating a German corporation probably would understand the annual report in French with franc evaluations better than in German with deutche mark presentation. You might even consider a column for euro presentations. Include the base report in your base corporate currency but provide completely different or side-by-side presentations in the readers' language. Investments and currency fluctuations shown in local currency increases the worldwide desirability of your equities, bonds, and other financial instruments.

The apparent technical nature of this paradigm and its practical ramifications for IT operations underestimates its potential to reform business expectations, integrate workflows, redefine the language of business, and initiate business evolution. Six fundamental issues underscore the relevance of the dynamic monetary representation paradigm. First, business is becoming more globalized, creating a hyper-competitive market most notable with the Internet. Second, financial instruments and operations have become more elaborate. Third, worldwide events effect even localized and naturally-hedged businesses, so much so that planning, operations, finance operations, and implementations must include concurrent and constant monitoring and analysis of these worldwide events for potential economic impact. Fourth, internationalized business requires integration and localization for improved efficiencies to access local markets. Fifth, massive economies-of-scale and unfulfilled opportunities are obvious on a global basis potentially to be exploited within the context of this new monetary paradigm. Sixth, some dynamic processes are only approximated, leaving profits, opportunity, improved business methods, and sustainable barriers to competition up for grabs.

Localized currency conversion of lending or investment opportunities in other countries increases business potential by expanding the knowledgeable base of vendors, supplies, customers, lenders, borrowers, market analysis, and even journalists. Contra-asset entries for rounding errors, triangulation discrepancies, transaction volumes, currency fluctuations, and other complexities of international business with multiple currencies can be micro-managed for additional profits; some organizations make extraordinary money on currency, tax rate, tariff, and local or international laws.

Suppose, for example, a bookseller with an Internet sales channel fulfills quotes at later dates. A useful accounting analysis contrasts quotations with actual sales made. Suppose 9 book presales price quotations generated only 8 sales within the subsequent month. Marketing wants to evaluate the success of a

promotion on the day that the original quotes were made in order to assess the effectiveness of advertising or price reductions. The forward evaluation of the (future) value of this sale *out nine years* is as easily generated as any other currency conversion. Notice the actual dates for each sale recast in localized currency. The accumulation is formatted in dollars, shown here as a future value of $430.28 (01/28/1999):

$48.92 12/23/98

Can$ 75.30 12/24/98

FF 298.92 12/26/98

Lit 79,661.33 12/23/98

¥6,483 12/22/99

1897 01/20/99

£28.76 12/23/97

€47.89 01/12/99

US$ 1246.13 08/25/08

(that is, 08/25/2008)

Suppose, as another example, a divisional buyer at a large automobile manufacturer has the task of acquiring 10 metric tons per month of stainless screws for new extended passenger SUV vehicle line: starting two years out for a duration of 5 years. This is in fact a common market auto industry policy for planning, pricing, and manufacturing product. Because the inventory space, cash flow, and lot requirements demand monthly deliveries, the buyer needs to price these purchases over a period of time including the time value of money as well as compare potential purchases from suppliers in Japan, Taiwan, United States, Sri Lanka, Brazil, and Argentina. Usually bids will be accepted denominated in dollars or the country of manufacturer, and the automobile manufacturer will typically split upward or downward intercurrency movements 50/50% with the vendor. This is a primitive hedge tactic that in no way addresses competitive or economic market factors, or seeks to create a sustainable competitive advantage.

Since the purchases will also include substantial tariffs, taxes, duties, sea shipping, port charges, various multiple segment delivery handling changes, and inspection fees, a large number of currency conversions and summations are required to construct a purchase plan forecast. Furthermore, suppose a storm diverts shipment, a sudden currency devaluation makes a delivery lot excessively expensive in spite of options or hedges, or a union goes on strike thereby shutting down the docks. Recalculation with present currency information can require as much time as the original proposal itself required; whereas a spreadsheet with tools based on the new currency paradigm provides the answers that self-adjust with up-to-date date-sensitive currency valuations.

Consider a third example. A pension fund manager has inflows from government employees for the third quarter in the amount of $38.76 million U.S. dollars to invest. Policy is such that the money must remain liquid for 35 days until the pension fund board of directors meets to vote as to how the funds should be invested long in equities. While short term U.S. Treasuries are providing rates of 3.47%, a capital shortage due to government and economic instability in Indonesia has created government-backed

corporate bonds returning 8.95% for interest rate arbitrage. With spot market conversion rates and a 34-day forward option to buy U.S. dollars, the fund manager nearly triples the income during the mandatory holding period just on interest alone. Because the size of the currency trade was so large and value of U.S. dollars so high with respect to the rupiah, in addition, the fund manager has added net 2.7% in hedged currency trades. This yields an overall return of 3.0% for the 34 days, or 32.22% annualized with minimal financial risk (subject only to the political stability of the government of Indonesia).

It is interesting to note that the ERISA rules favor risk aversion through diversification by holding "foreign" securities for pension plans. Of the $500 billion USD contributed annually for pension funding, only 3% is invested overseas. Foreign investment reduces volatility, and this is particularly important in smaller countries, such as Taiwan, Great Britain, and Italy, where only 15% of pension funding is overseas, instead of an expected 70%, based on economic risk, real interest rates, and tax avoidance strategies.

Conclusion

You can augment your knowledge, your business ingenuity, and provide leading edge services to your clients or employers by migrating to dynamic monetary accounting. All the pieces are not currently in place. However, you can however begin to modify accounting operations for the next millennium by expanding the traditional accounting paradigm to include dynamic monetary accounting. I am sure you realize that dynamic monetary representations integrate standalone processes in many business environments, globalize transactions, provide convergence for disparate business operations, and unify many rarified types of accounting procedures into the mainstream.

If this paradigm frightens you because you think if will drive away business or cause current relationships to sour, reassess how these organizations will adapt or fail as the accounting technology evolves around them. Also, reconsider what you can bring to a client or employee in terms of three new dimensions in financial accounting. Someone will have to be skilled with it. By transforming the language of business, you lay a foundation for your own and for business evolution. It is a convenient and enabling business and finance shift.