

SIMPLY STATED: REA AND USEFUL ACCOUNTING INFORMATION

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Abstract: The Resource-Event-Agent (REA) Model and the FASB/IASB convergent conceptual framework are separately-developed abstract models that address similar issues. This paper attempts to bridge these separate theoretical disciplines in an effort to stimulate a productive dialogue and create economic efficiencies in the future. The REA model is a tool that may be employed to provide the types of information that are emphasized by the developing convergent conceptual framework. An overview of both frameworks, as well as suggestions for implementing synergies, is provided.

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Introduction

This year, 2007, marks the 25th anniversary of William McCarthy's development of the Resource/Event/Agent (REA) ontology. REA provides a unique perspective through creatively modeling economic reality, generating useful information and analysis for decision-makers, and enabling limitless measurement queries. Use of REA thus facilitates the assessment and design of business processes, the development of policy infrastructure including internal controls, the generation of reliable external financial reports and information for internal management and external business collaborators, compliance with governmental regulation, and promotes analysis, tax planning, and non-financial assurance work. Despite the evident usefulness of this framework to accounting practice, many accountants remain unfamiliar with it. Furthermore, REA has not been linked with the conceptual framework for accounting; nor has the future of REA scholarship been explored, specifically how REA can enable the realization of the goals of the conceptual framework. Essentially, with these oversights, a valuable tool for accounting practitioners and researchers remains under-used and synergies between the research efforts of financial reporting experts and REA practitioners are absent.

In this paper, I attempt to redress these issues by bridging these areas of scholarship in an effort to foster a better understanding of REA and how it relates to and promotes information usefulness as stressed in the conceptual frameworks of the Financial Accounting Standards Board (FASB) and the International Accounting Standards Board (IASB). To that end, I first provide an introduction to the REA framework. Then I discuss the financial reporting conceptual framework and provide an analysis of the concept of decision usefulness. I then

demonstrate the linkages between the REA and the financial reporting conceptual frameworks. The paper concludes with a discussion of the future of the REA in financial reporting practice and research.

The REA Model

The REA Model (McCarthy 1982) is a framework for looking at the interrelationships between economic actors and events that result in transactions. These relationships are defined by Resources, Events, and Agents. A business Event is assumed to involve a dual transaction, for example where one party gives and the other receives as the central economic activity. From an organizational standpoint, both an Agent internal to the organization (an employee) and one external to the organization (customer or supplier) may participate in an Event. Resources may flow in and out of the Event. For example, when a business acquires (gets) a product, it pays (gives) cash; when that product is sold, the business receives (gets) cash while providing (giving) the inventory. The cash and the inventory constitute “Resources,” the exchanges constitute “Events,” and the business and its suppliers and customers constitute the “Agents” under the REA model. While the above explanation and examples are simplistic, REA may be used for modeling highly complex business processes.

By identifying the Events (underlying transactions, past, present and future), the Agents (economic actors) who participate in those Events, and the Resources that flow into and out of those Events, we can develop a pattern or model for the underlying business enterprise.

McCarthy’s (1982) classic REA model of Elmo’s cookie business is shown in Figure 1. Using an entity-relationship (E-R) diagram to represent a simple REA model, the figure provides a picture of Elmo’s business. The duality business event (E) is shown as the exchange of one

dollar for a cookie. Elmo and Cookie Monster are the agents (A) participating in the event, and the cookie and the cash are the resources (R) that flow in and out of the event. The basic pattern of this simple model can also be seen embedded in REA diagrams depicting multifaceted business processes, helping us translate sophisticated underlying economics into repetitive patterns.

Attributes, Relationships, Cardinalities, Commitments, Types, and Databases

The REA model provides for each R-E-A component to possess attributes. Attributes may be assigned to the R, E, or A's based on object patterns. For example, attributes for a "Customer" agent might include the customer's address and ID number; each individual customer number and address being an instance of the object "customer." Resource attributes for "Inventory" might include elements such as inventory numbers, product color, and design. Classic business script patterns (along with object patterns) link the R-E-A components. For example, the "entrepreneur script" of securing capital, participating in value-added exchanges, and then making a profit, underlies the interrelationships modeled in REA. Although not technically or uniquely part of REA, an REA model may identify cardinalities for all the relationships between the R's, E's and A's. As a descriptive modeling notation, cardinalities provide information about relationships between objects, for example, that one customer may participate in multiple sale events, or many employees may participate in one sales event.

Extensions to the basic REA model may incorporate type-images (e.g., groupings or types of employees, policies, or controls) and by using commitment-images (e.g., contracts and agreements) (Geerts and McCarthy). Also, collaborative space modeling, including binary and mediated collaborations, are enhancements available in the REA ontology, providing for the modeling of the economics between businesses not just within a single business. Figure 2 is a

graphical depiction of the basic REA model plus enhancements including commitment-images, type-images, and collaborative relationships with other businesses as well. REA expansions are in their infancy (Geerts and McCarthy), but they indicate the opportunities presented by a facile ontology.¹

When business reality can be represented by patterns incorporating dualities, flows, and participation of events, resources, and agents, a comprehensive model of business activity becomes possible. Ultimately, the REA model (including attributes, relationships, commitments, and typifications) can be used to represent business reality – both to create a powerful model of business enterprise and policy infrastructure, as well as to direct the design of the underlying relational database from which information can be extracted and exchanges measured. This comprehensive model and sophisticated database permit a more powerful degree of business analysis (past, present, and future) than possible with more simplistic models.

The Financial Reporting Conceptual Framework

According to Foster and Johnson (2001, 1), “the conceptual framework is a body of interrelated objectives and fundamentals. The objectives identify the goals and purposes of financial reporting and the fundamentals are the underlying concepts that help achieve those

¹ Geerts and McCarthy (2003) and Hruby (2006) have developed standard templates for the R’s, E’s, and A’s of different business processes, incorporating existing events as well as commitments for future events and types of events, resources, and agents. These expansions of the basic REA model are beyond the scope of this paper, but the reader is encouraged to pursue additional readings on REA; references are listed at the end of the paper. Numerous papers and textbooks present detailed explanations and examples of REA models incorporating commitments and grouping types of resources, events, and agents.

objectives. Those concepts provide guidance in selecting the transactions, events and circumstances to be accounted for, how they should be recognized and measured, and how they should be summarized and reported.” Elements addressed by the FASB’s conceptual framework include establishing objectives for financial reporting for both business enterprises and non-profits, defining the characteristics of “useful” accounting information, defining the elements of the financial statements, establishing criteria for recognition and measurement of the elements of financial statements, and raising the question of the use of cash flow and present value information in the financial reporting context (Foster and Johnson 2001).

The framework is an essential tool for resolving accounting and reporting questions and deciding between competing alternatives (Johnson 2004). Figure 3 provides a graphical depiction of the FASB framework. Development of the framework began with the top level (objectives) and moved downward through the fundamental, operational, and display levels (Johnson 2004). The framework is currently under re-examination as a result of the promotion of harmonization between the FASB and the IASB. The process has resulted in a refocusing of the convergent framework dialogue on the concept of “decision usefulness” as defined by the usefulness of the information to existing and future providers of capital and other stakeholders who are making resource allocation decisions (Bosso and Hague 2006). Bosso and Hague (2006) also suggest that information should meet the needs of a wide group of primary users and should provide information to help assess the amounts, timing, and uncertainty surrounding an entity’s cash flow prospects.²

² The convergent FASB/IASB conceptual framework specifies that the objective of accounting is to provide information useful for business and economic decision making, including but not restricting this information to financial statements.

The Conceptual Framework and the REA Model

In Bosso and Hague's (2006) definition of decision-usefulness, the overlap between the convergent conceptual framework and the REA model is patently clear. Bosso and Hague (2006) specifically identify components of decision usefulness: information about the economic resources and claims to them (or, according to the REA model, Resources), information about the effects of transactions, commitments, and other events that affect economic resources (or Events), and management narratives necessary to enable users to understand the information provided and evaluate management's stewardship responsibility (or Agents).

Discussions of the convergent conceptual framework outline four qualities of decision-useful financial reporting information: relevance, faithful representation, comparability, and understandability (see Storey and Storey 1998, for example).³ These qualities are subject to two pervasive constraints: materiality and benefits that justify cost. As discussed above, the REA model not only permits the assembly of a comprehensive and sophisticated business model, but yields a powerful tool for designing systems to deliver information pertaining to the very qualities emphasized by Bosso and Hague (2006). The optimization of systems for delivery of this type of information may substantially alter the existing cost-benefit relationships by significantly decreasing the information production costs while expanding the analytical options.

³ Faithful representation is the idea that information has the quality of being dependable, that it can be counted on by users to represent faithfully that which it purports to represent (or could reasonably be expected to represent), and is free of material error and bias. Information that purports to represent real-world economic phenomena must be neutral, complete, and verifiable. Information should also have predictive value or value as an input to the predictive process.

Accounting Information Systems and Business Analysis

With an information system designed under the REA model, the focal point of the system is the underlying data and economic events in a business enterprise rather than on the financial statements. This permits the representation of all or most of the actuality of a business enterprise, and suggests a shift in measurement from the generation of standard financial statements to the modeling of underlying economic events. In other words, the REA model permits system design that captures the reality of the business into a comprehensive model of the entire enterprise, incorporating all or most of the underlying economic events, the inflows and outflows of resources, and of the participation of internal and external partners and agents.

These Events include not only those that have already occurred, but those that are committed to occur, as well as groupings or types of Events, Resources, or Agents. This emphasis represents a considerable departure from the traditional financial-statement based focus of many contemporary accounting information systems, and permits a much more comprehensive and flexible approach to envisioning the business, its context, and its future. The underlying information mass may be analyzed and accessed in whatever way that is most satisfying to the user. Instead of dictating the output, accountants may work to effectively capture the business economic reality for satisfying the information needs of decision makers.

Directions for Future Consideration

Accounting Practice and Accounting Systems

Elliott (1998) speaks to the need of the accounting field to appeal to a larger set of stakeholders than the limited class of providers of financial capital. He argues for an expansion in the type of information provided, including real-time and non-financial information and in the

service of this expansion to reconsider the technologies for information production. He suggests that batch production and periodic reporting are outmoded concepts that do not adequately serve the constituencies of the accounting profession; instead, he states, accountants should focus on providing underlying data on financial and non-financial factors so that those seeking information may best tailor it to their individual needs.⁴

The contemporary business world is sophisticated, requiring information for decision making across business processes, supply chains, diverse customers, and human resources. These information demands are far beyond the capabilities of a traditional legacy accounting system and even market-leading software. The marketplace is full of archaic and obsolete software. Companies are struggling with information systems that are limited by the deficient models underlying the enterprise software design. These factors point to a need for substantial investment in information technology, but more importantly to a re-visioning of the design of that technology. The REA model, in supporting the stated goals of the reporting conceptual framework, provides an established ontology through which that re-visioning may take place.

Accounting Scholarship

Kinney (2001) presents a number of challenges to scholars, among which is the study of the impact of non-financial and information technology opportunities available to accountants for adding value. He defines the domain of accounting scholarship as “the knowledge of the

⁴ The reshaping effect of information technology speaks to the artifacts of debits and credits and the need to rethink the basis of generating accounting information. David, et al. (2003) have developed an evolutionary framework to categorize today’s enterprise software market. The evolution presented includes legacy accounting systems based on debits and credits, through enterprise accounting systems (e.g., ERP software), and ultimately, to e-collaboration systems.

individual and aggregate effects of alternative standardized business measurement and reporting structures” (p. 278). He identifies elements essential to the value of accounting scholarship: “(1) relevance of a set of standardized business measurements for a wide variety of decisions made by diverse decision makers, (2) precision or care in applying the measurement criteria, and (3) trustworthiness of measurement displays. The three elements are operationalized through four sequential activities or observables: (a) choice of a standardized business measurement structure, (b) application of the structure to particular entities, (c) customization of resulting information for particular decision, and (d) resulting decisions and outcomes” (p.275).

The FASB conceptual framework mentions that the information provided to decision makers is affected by the characteristics and limitations that financial reporting can offer. William McCarthy in a PowerPoint presentation The Evolution toward REA Accountability Infrastructure for Enterprise Systems, hypothesizes that research should progress on mapping collaborative systems using the REA ontology, leading to a more ideal representation of events without implementation compromises. As various debates are taking place regarding the future of accounting information, scholarship, and improving its value, McCarthy’s REA ontology can provide some guiding light for the future. Possibly, the adoption of the REA model by the business research world can create a common ontology for establishing a precise, relevant, and trustworthy 21st century standardized business measurement structure applicable to business entities, able to be customized, and able to facilitate decision making. A progressive modern ontology will allow for hypothesizing research questions that are now limited by artifacts and a narrow focus on external financial reporting. Not only will our research “lens” be reshaped, it can be vastly transformed and supported by the REA ontology, resulting in highly innovative and relevant research.

Conclusions

As McCarthy (1982), Elliott (1998), and Kinney (2001) urge, we should challenge ourselves to critically examine the future of accounting. Technology has made the classic model of accounting information systems and accounting services much broader than traditionally conceived. Our profession needs to rise to the full opportunity of providing useful information given the technology available in the 21st century, not remain vested in outdated ontologies and artifacts. The new model should adhere to the qualitative characteristics emphasized by the conceptual framework such as usefulness, relevance and representational faithfulness. A shift from what should be reported on financial statements to what should be captured in a model of the business would be an exciting and productive use of our collective professional intellect and ambitions. The REA ontology offers just such a comprehensive modeling approach.

Capturing the true and complete economic picture of a business will provide the most useful information to decision-makers. It will enhance representation faithfulness, transparency, and information about the inflows and outflows of assets and liabilities to say the least. Moreover, it will focus attention on key business processes - identifying value in economic events, the resource flows and agents participating in the events. Decision-makers can consider the powerful underlying model of resources, events, agents, commitments, collaborations, etc. and additionally, query a database to satisfy information needs.

The objective of this paper is to motivate consideration of the REA model by practitioners and academics. Models and information regarding key business patterns are highly useful to decision makers in complex enterprises. The REA ontology enables the development of a facile and comprehensive model of economic events based on verifiable patterns of business activity. The conceptual framework requires a focus on reporting activities and information

useful for decision making and strives for the faithful representation of underlying economic activity. Perhaps the answer to providing fundamentally useful accounting information lies in accurately modeling the underlying reality of the business processes rather than the output.

As the accounting profession and academia look to the future of adding value to business decision makers and scholarly research, we should become more educated about and focused on modeling the underlying reality of economic activity. We should employ our intellectual abilities, broaden our horizons and imaginations, and expand our concentration on financial reporting to include more discussion about what is essential to capture in models of business reality; the resources, events, and agents. Examining the REA model is a stimulating way to begin the conversation.

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Figure 1. REA Model, Elmo's Cookie Business

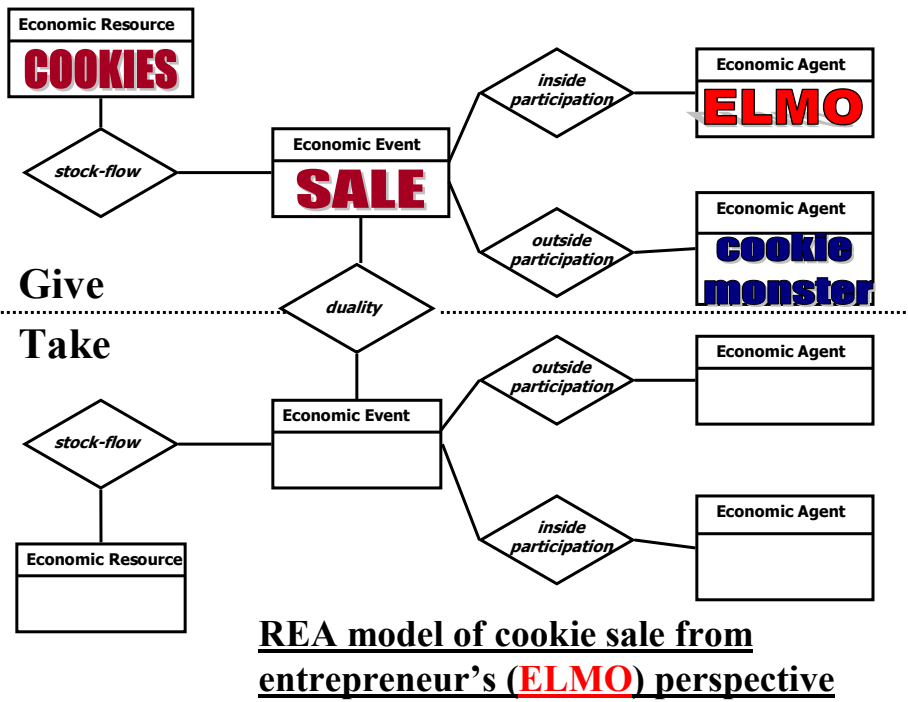
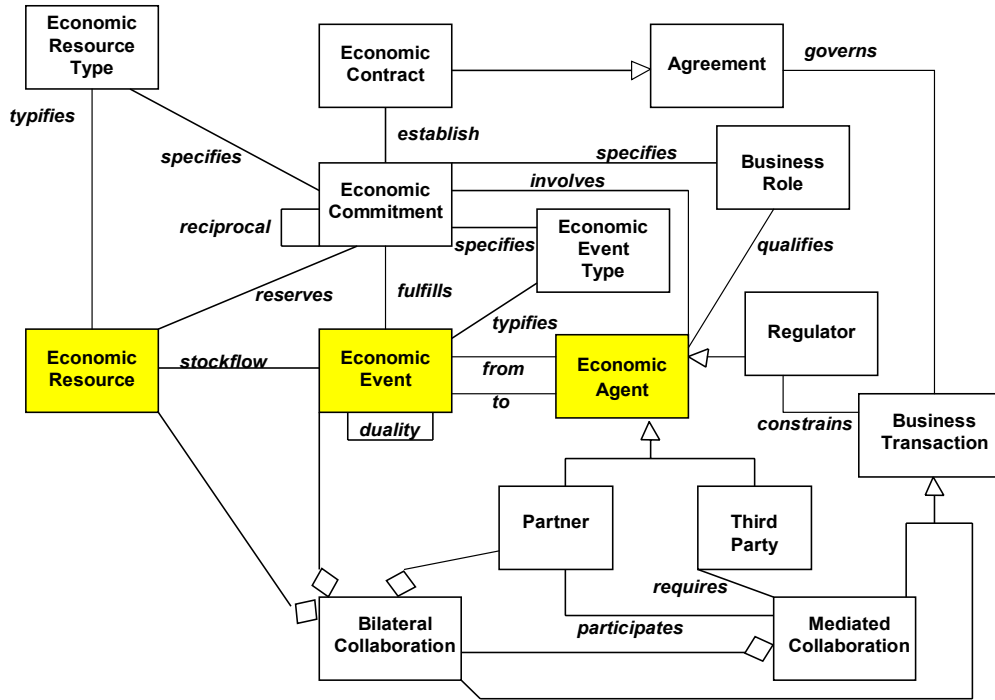


Figure 2. Enhanced REA Model including commitments, typifications, and collaborations



ISO Open-edi Ontology Collaboration Model

SOURCE: Adapted from ISO 15944-4, W.E. McCarthy

Figure 3. FASB Conceptual Framework for Financial Accounting and Reporting (from Johnson 2004)

