The REA Ontology: Integrating practice, teaching, and scholarship with design ideas from the far reaches of the accounting universe

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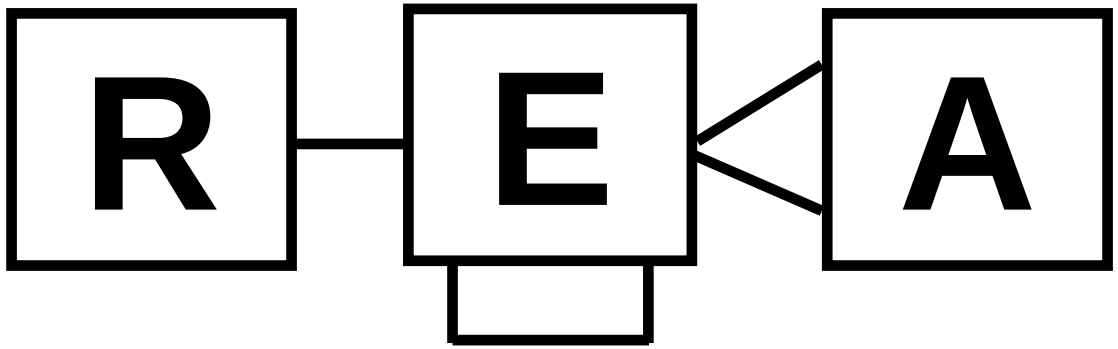
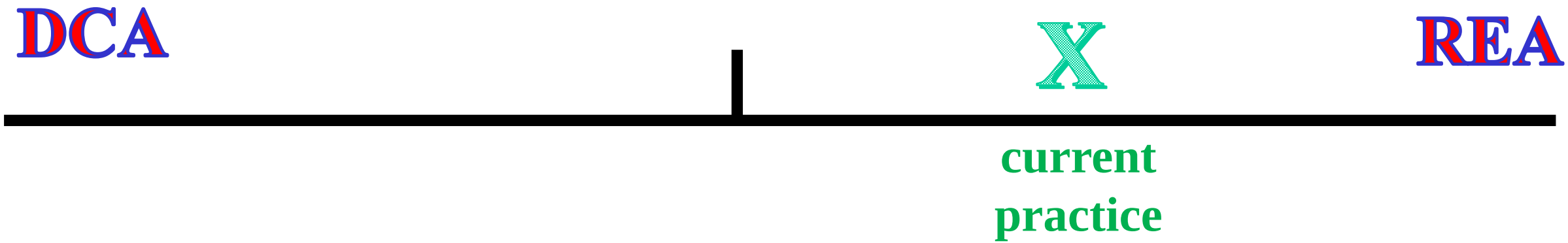


This deck includes the slides with links from my Keynote Speech given to the American Accounting Association SPARK Conference in June 2020.

Some useful background -1

- The **REA** (**R**esource-**E**vent-**A**gent) ontolgy is based on a paper published in the *Accounting Review* in 1982. It is a different method for representing economic phenomena than the **DCA** (**D**ebit-**C**redit-**A**ccount) mechanisms of traditional double-entry accounting, which are meant to maintain the equality of the fundamental accounting equation: **A**ssets = **L**iabilities + **O**wners **E**quity (**ALOE**).
- The way that modern (2020) business systems, both <u>within</u> enterprises (like ERP) and <u>between</u> enterprises (like blockchain), capture economic transactions is actually closer to the REA vision than it is to traditional double-entry.



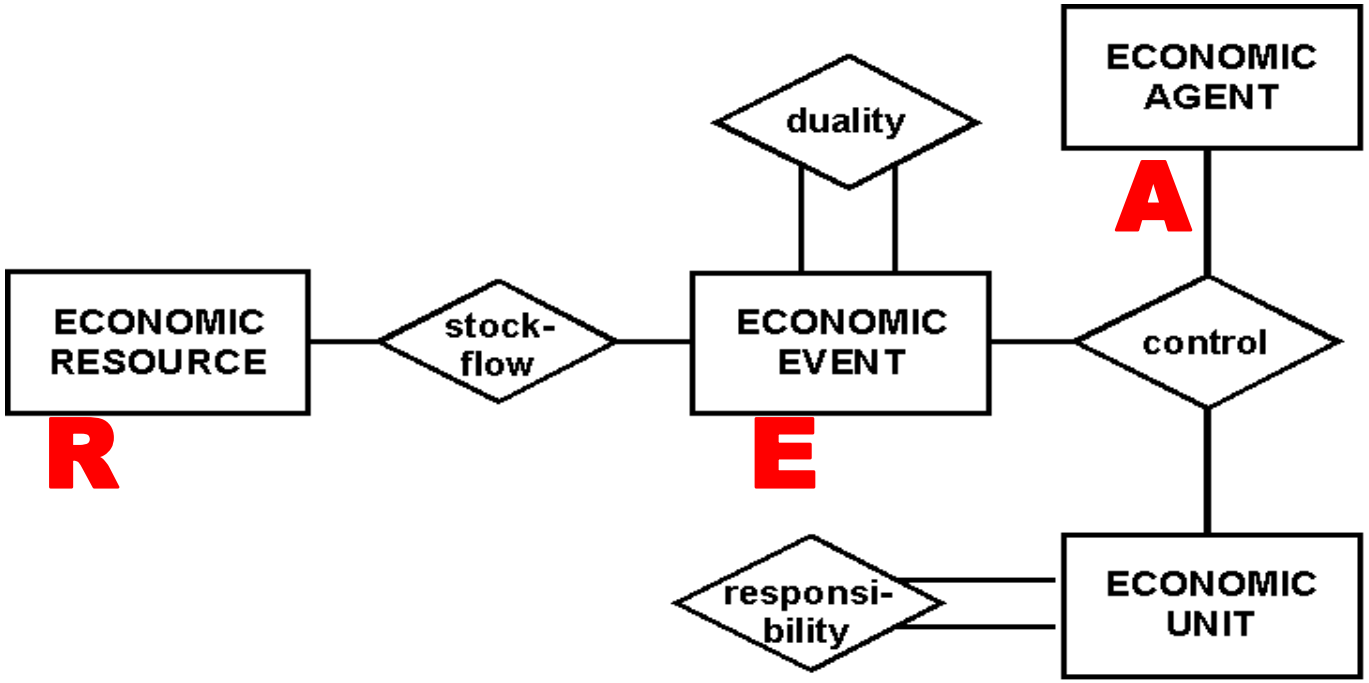
- Enterprise systems built on REA principles are able to produce all of the traditional accounting statements (balance sheets, income statement, etc.).

Some useful background -2

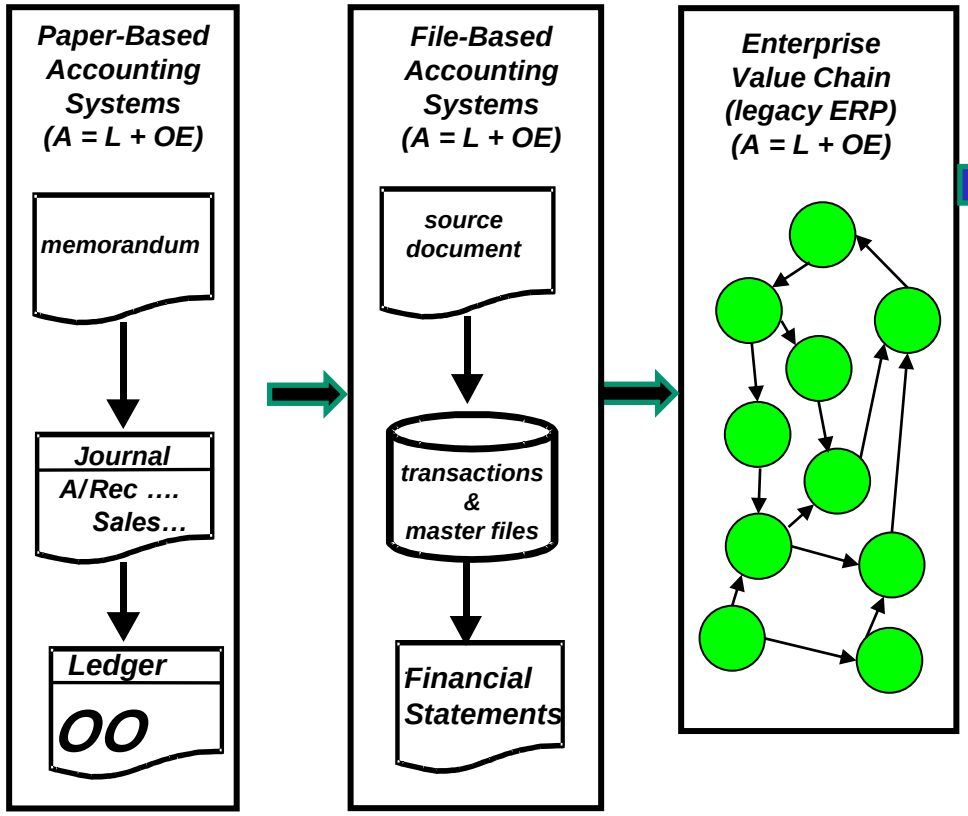
Original REA criticisms of the conventional accounting model:

1. Its dimensions are limited
2. Its classification schemes are not always appropriate
3. Its aggregation level for stored information is too high
4. Its degree of integration with the other functional areas of the enterprise is too restricted

REA principles



REA model

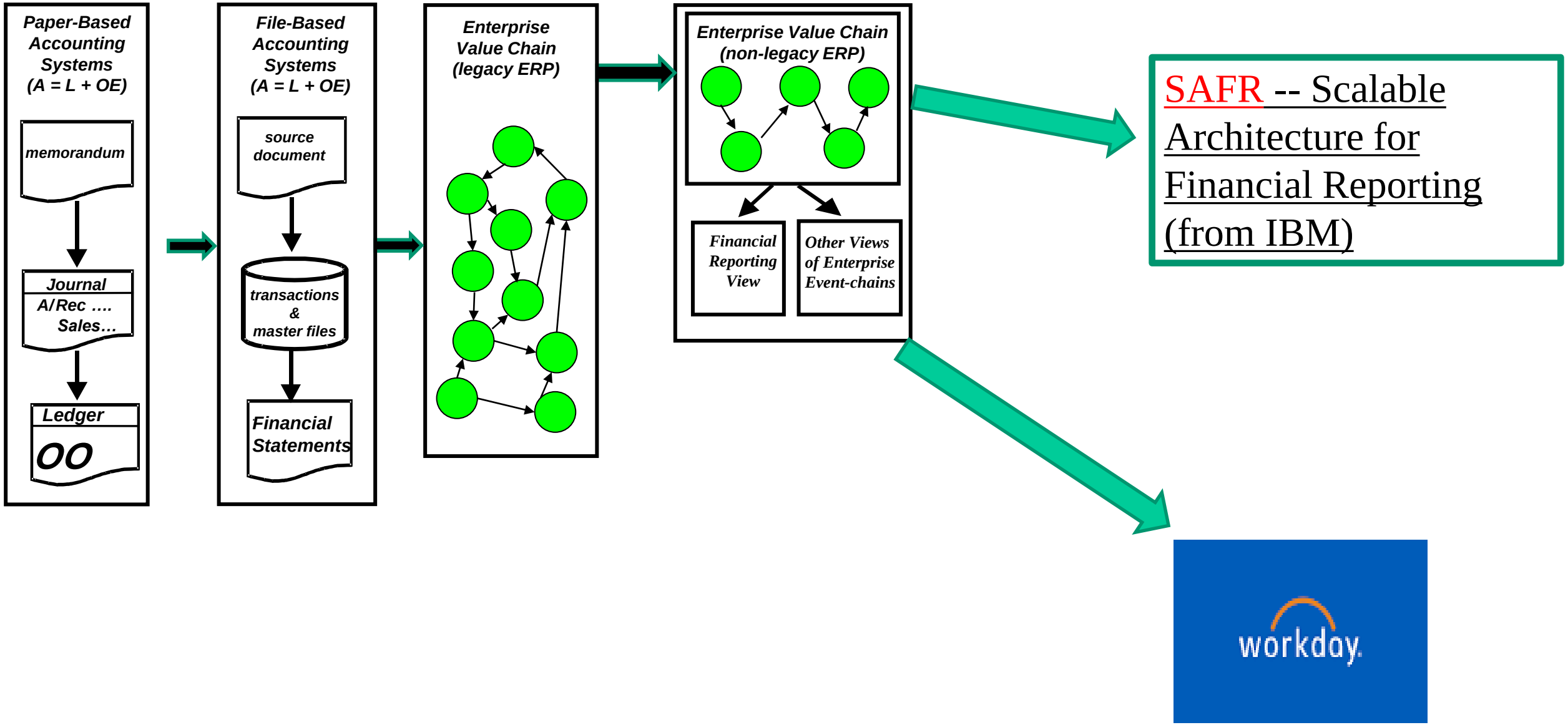


Integration of accounting, manufacturing, logistics, marketing, etc. was done from the bottom-up and with decided general ledger priority. Results move account-filter close to transaction capture.

account hacking to mimic entrepreneurial logic, multidimensionality, and integration.

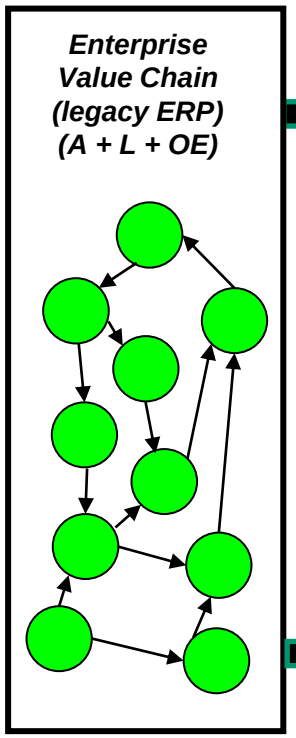
I don't want to spend time explaining what is wrong with syntactic solutions, but what is right with semantic solutions.

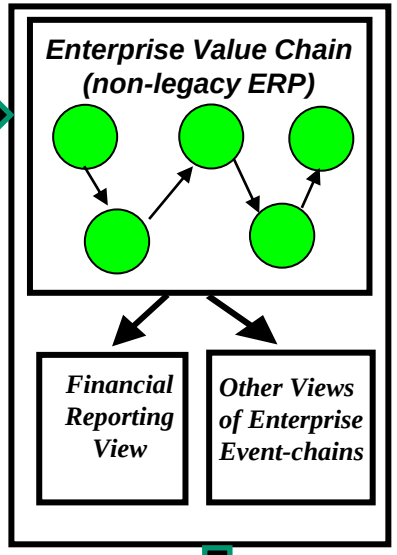
https://aaahq.org/Meetings/2016/Accounting-Is-Big-Data-Conference/Video-Gallery/AIBD-Video-10-Public

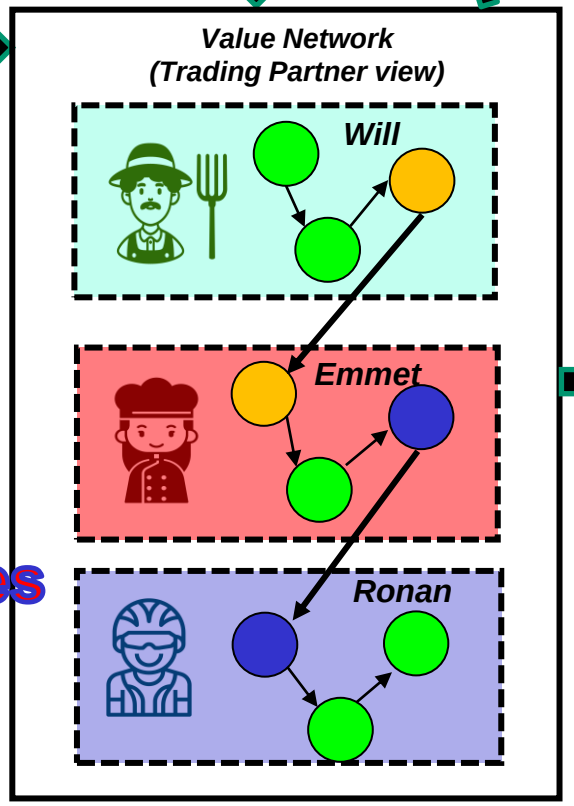


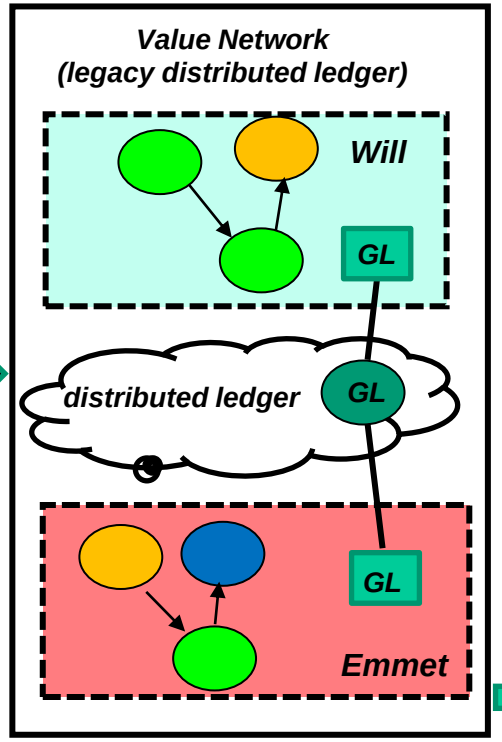
Accounting System Evolution
(Source: Adapted from David et al. 2003)

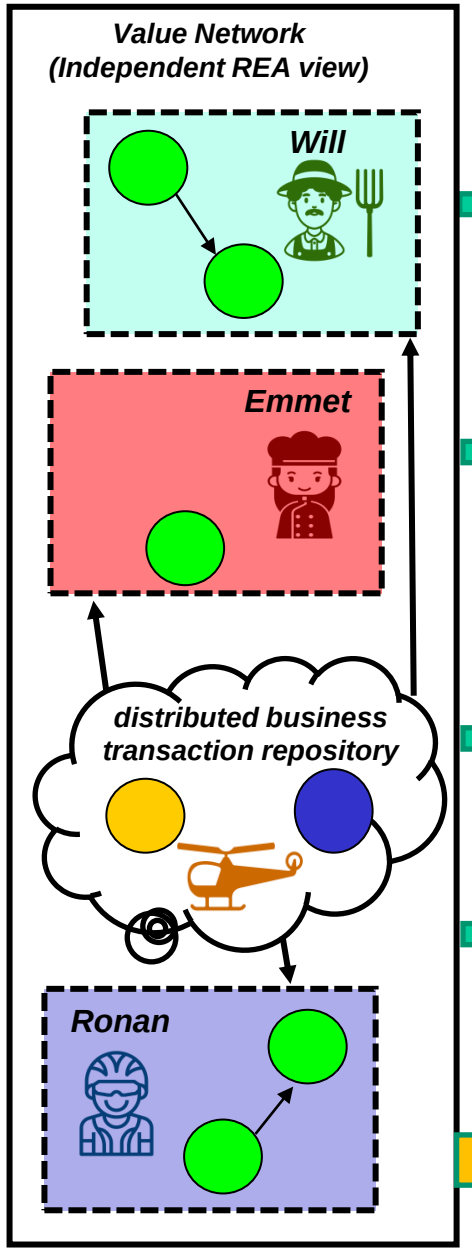
REA Implementations from the Independent view











8-9 communities

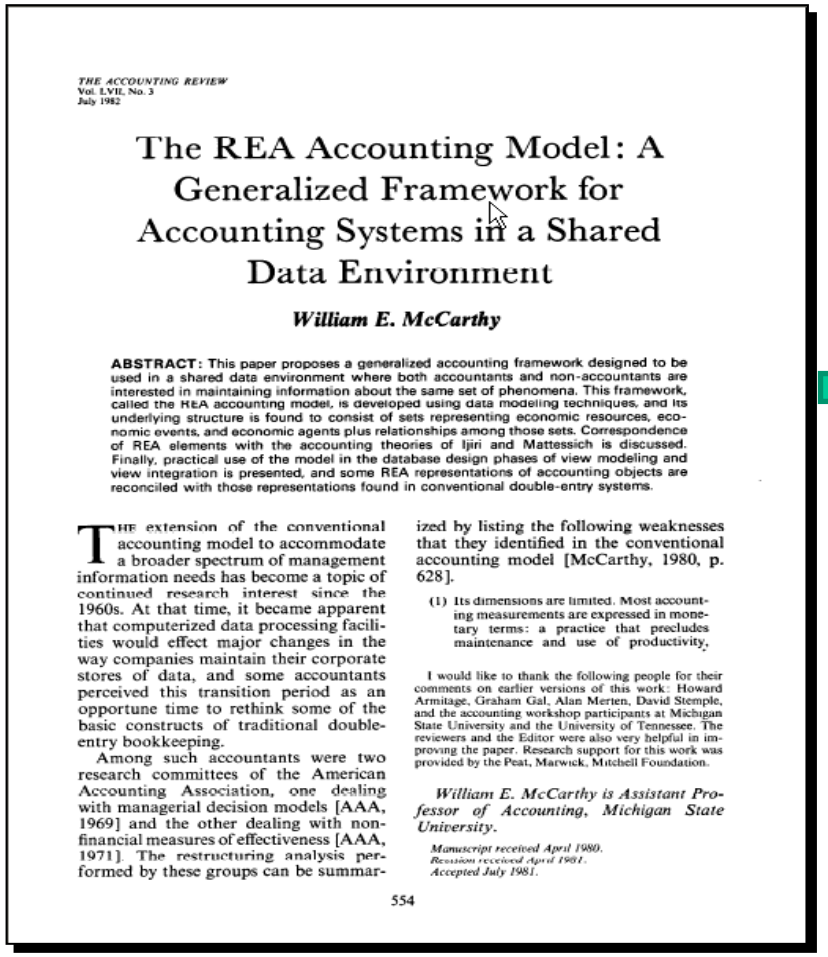
Valueflows

Peer-to-Peer (P2P) Accounting

Holochain

ISO 15944-4

Accounting Blockchain Coalition panel



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The REA Accounting Model: A Generalized Framework for Accounting Systems in a Shared Data Environment

William E. McCarthy

ABSTRACT: This paper proposes a generalized accounting framework designed to be used in a shared data environment where both accountants and non-accountants are interested in maintaining information about the same set of phenomena. This framework, called the REA accounting model, is developed using data modeling techniques, and its underlying structure is found to consist of sets representing economic resources, economic events, and economic agents plus relationships among those sets. Correspondence of REA elements with the accounting theories of Ijiri and Mattessich is discussed. Finally, practical use of the model in the database design phases of view modeling and view integration is presented, and some REA representations of accounting objects are reconciled with those representations found in conventional double-entry systems.

THE extension of the conventional accounting model to accommodate a broader spectrum of management information needs has become a topic of continued research interest since the 1960s. At that time, it became apparent that computerized data processing facilities would effect major changes in the way companies maintain their corporate stores of data, and some accountants perceived this transition period as an opportune time to rethink some of the basic constructs of traditional double-entry bookkeeping.

Among such accountants were two research committees of the American Accounting Association, one dealing with managerial decision models [AAA, 1969] and the other dealing with non-financial measures of effectiveness [AAA, 1971]. The restructuring analysis performed by these groups can be summarized by listing the following weaknesses that they identified in the conventional accounting model [McCarthy, 1980, p. 628].

(1) Its dimensions are limited. Most accounting measurements are expressed in monetary terms: a practice that precludes maintenance and use of productivity,

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William E. McCarthy is Assistant Professor of Accounting, Michigan State University.

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Dechow, Sloan, Zeng, AH, March 2020

Dunn, Gerard, and Grabski, 2016

The REA Accounting Model as an Accounting and Economic Ontology

McCarthy, Geerts, Gal (forthcoming)

Chapter 6 -- Necessary extensions and future directions in REA work

(1) the use of business process state machines,
(2) the expansion of automated reasoning capabilities within REA,
(3) the specification of claims (debt and equity) and their alignment with other financial ontologies,
(4) the expanded components of a procedure hierarchy designed to materialize general ledgers for financial accounting reporting purposes,
(5) the accommodation within REA structures of newer conceptual methods for advanced types of costing championed by the IMA (2012), and
(6) reconciliation of REA participation and control principles with accepted best practices in the areas of corporate governance and control frameworks.