University of Massachusetts Amherst

The Implications of Collaboration Space on Interoperability and Blockchains

Dr. Graham Gal

47th World Continuous Auditing & Reporting Symposium – November 8 & 9, 2019

Isenberg School of Management

Things that will be covered

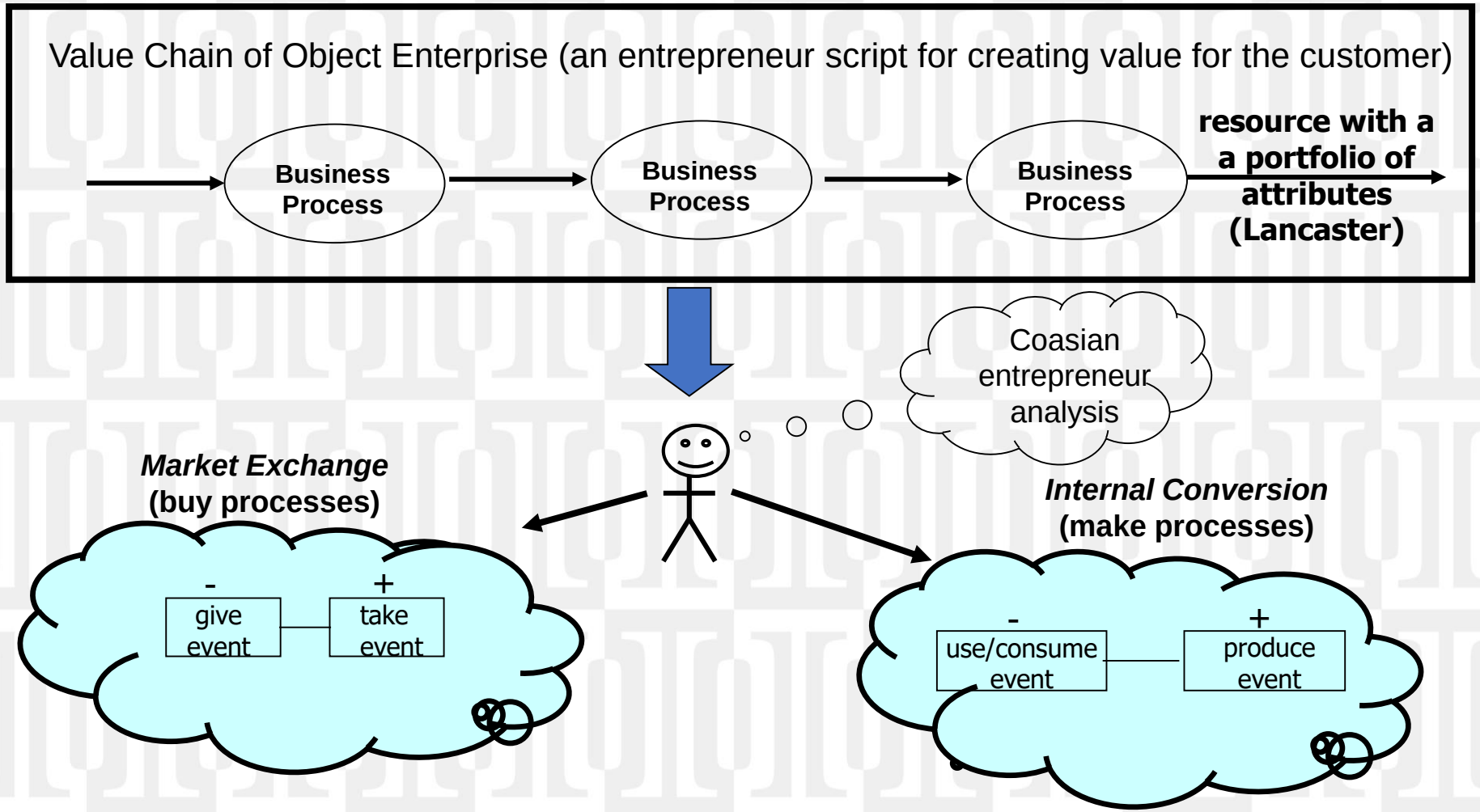
- Trading Partner view of accounting
- Collaboration Space
- Interoperability
- Blockchains need for interoperability

Material in this presentation comes from

Query Issues in Continuous Reporting JETA 2008

The REA Ontology monograph forthcoming from the American Accounting Association (in page proof stage)

Traditional Make or Buy Decision



Transactions come to be organized within firms rather than in the market when the suppression of the price mechanism by the authority of the entrepreneur/coordinator is more economical than a series of exchanges negotiated between the relevant parties (Coase 1937). Conditions that affect this tradeoff include some of the following (Kroszner and Putterman, 2009):

- **Transaction costs (like finding prices)**
- **Limited entrepreneurial attention**
- **Contractual arrangements and employment contracts**
- **Residual claims of equity and mixed financial structures**

. Firm-specific assets and firm-specific human capital
. Transaction frequency and scale of production
. Costs of monitoring
. Lower powered incentives

Figure 4-10 – Entrepreneur Choice of Exchange vs Conversion

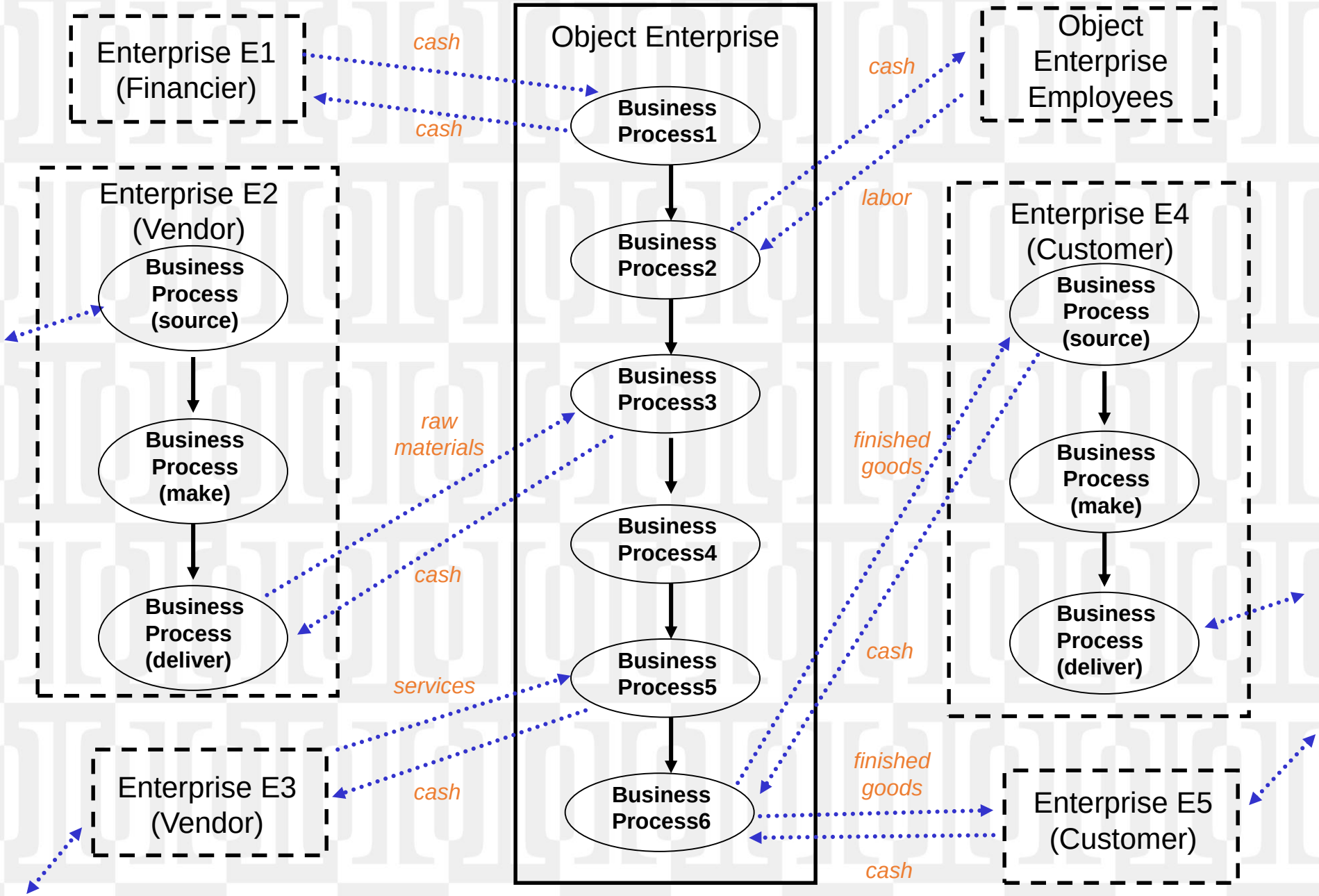


Figure 2-5 REA Modeling at the Value Network Level

Trading Partner Accounting

Make Decision
DB WIP
CR Raw Materials

Buy Decision
DB Accounts Receivable
CR Sales

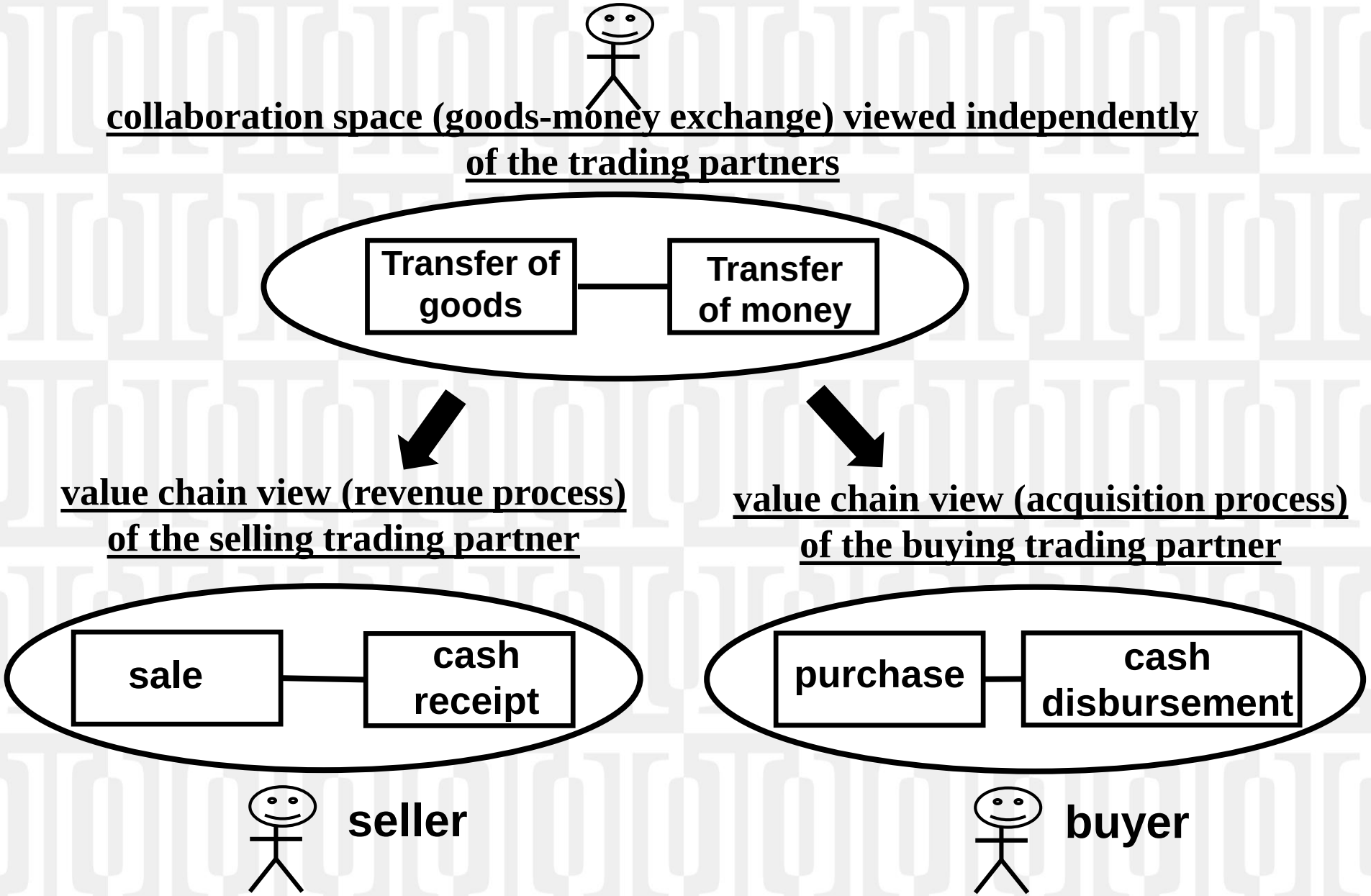


Figure 5-2 – Different Views of a Goods-Money Exchange

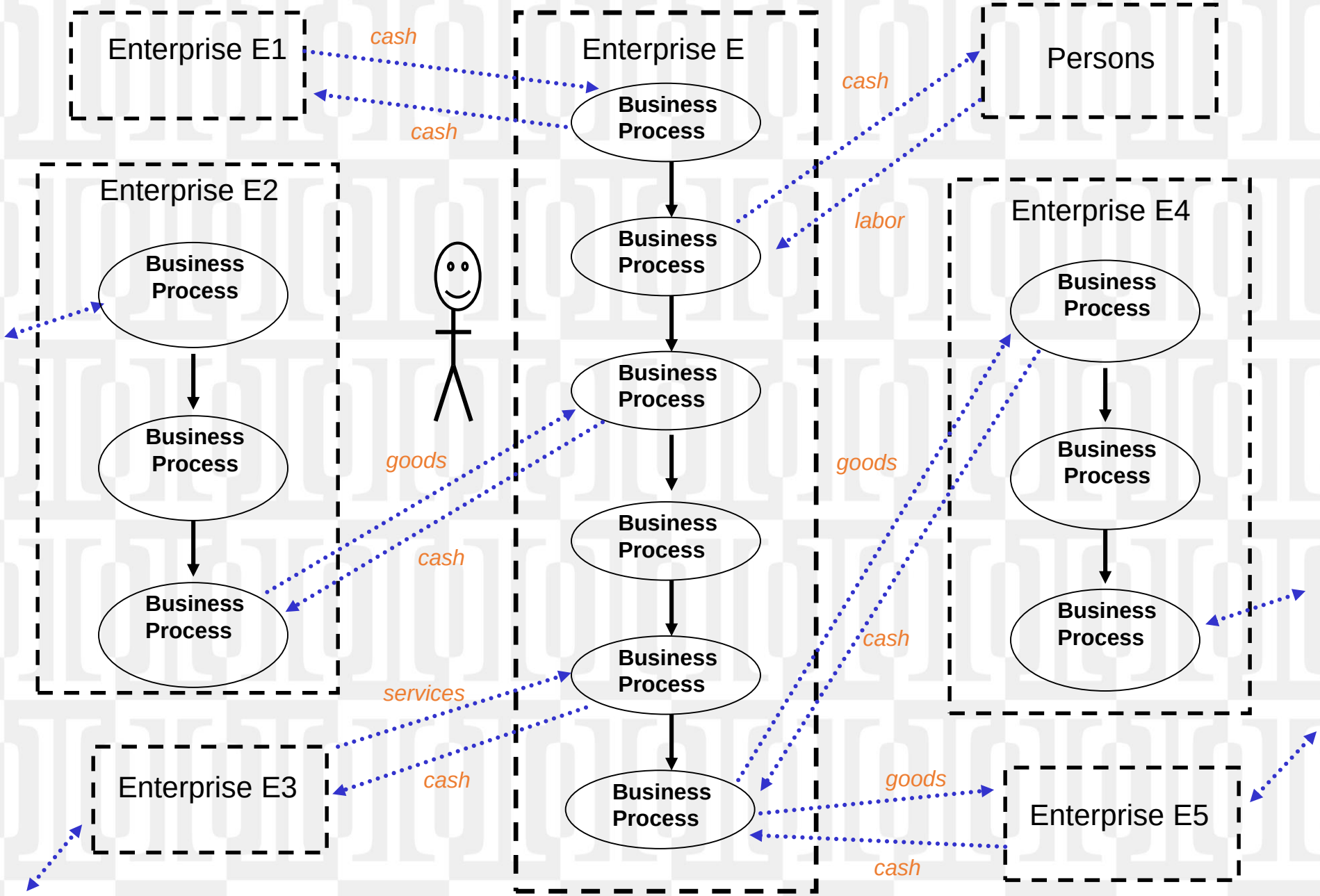


Figure 5-6 – REA Modeling at the Value Network Level (Independent View)

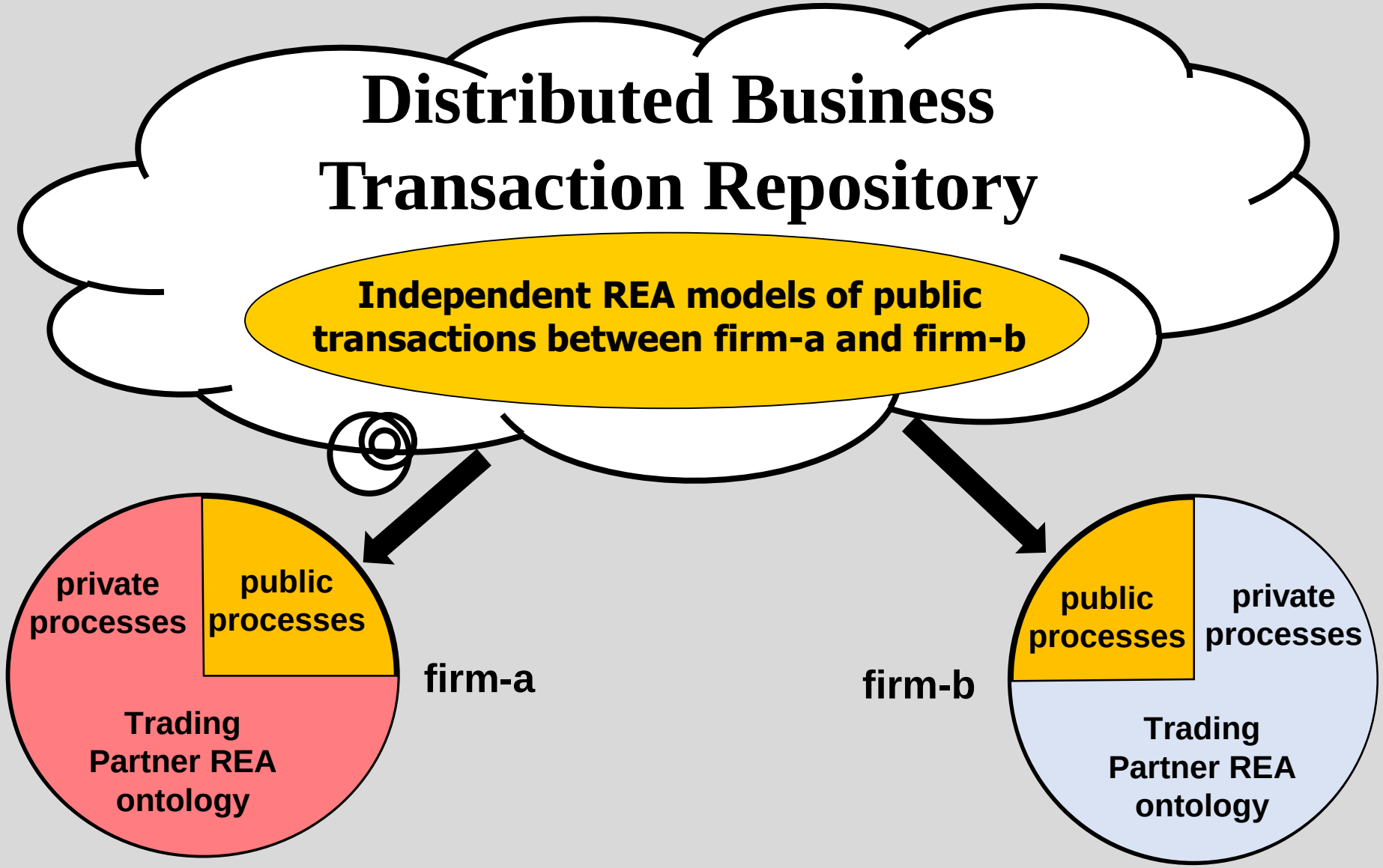


Figure 5-9 – Collaborative Storage with a Distributed Business Transaction Repository

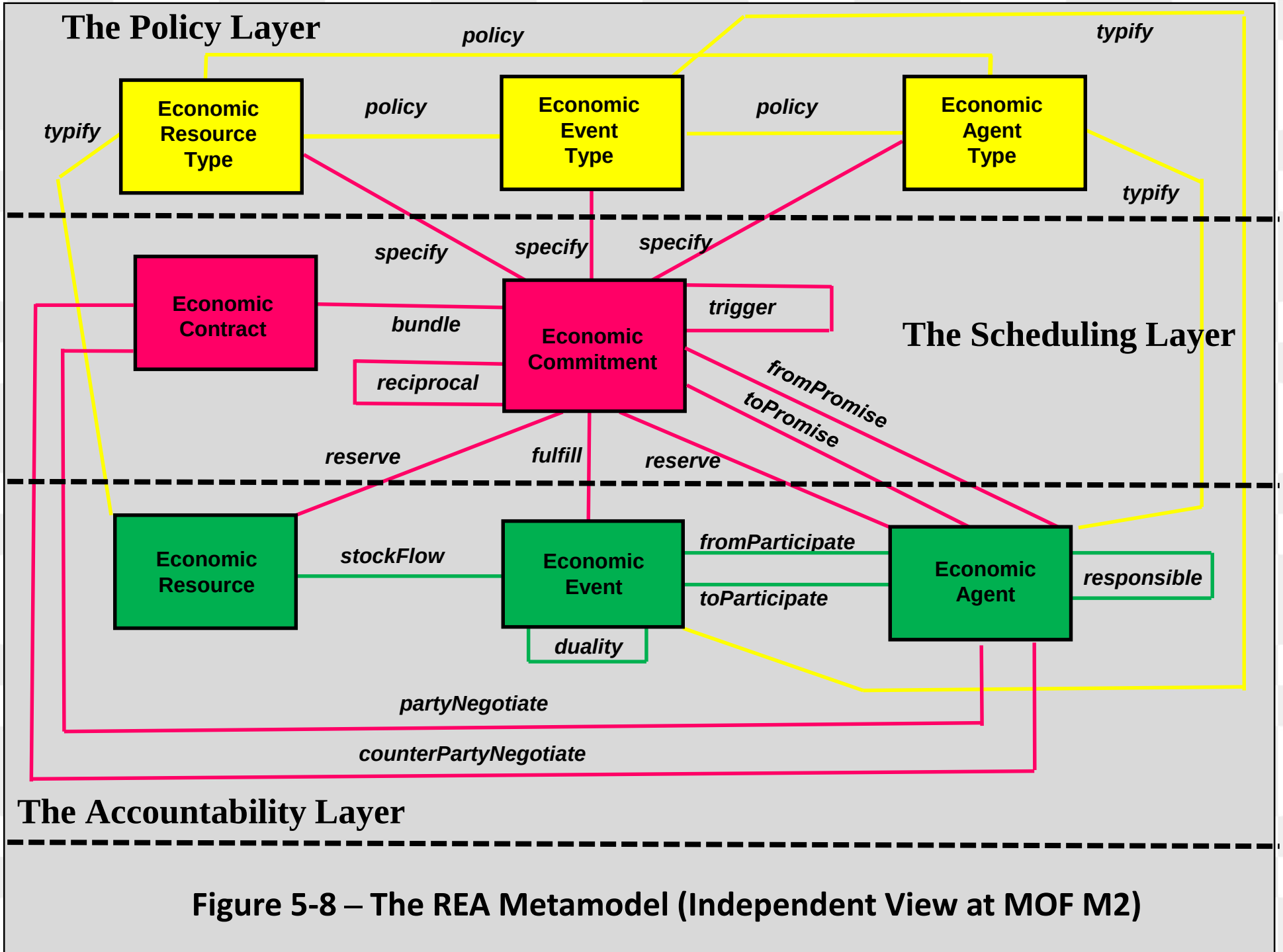
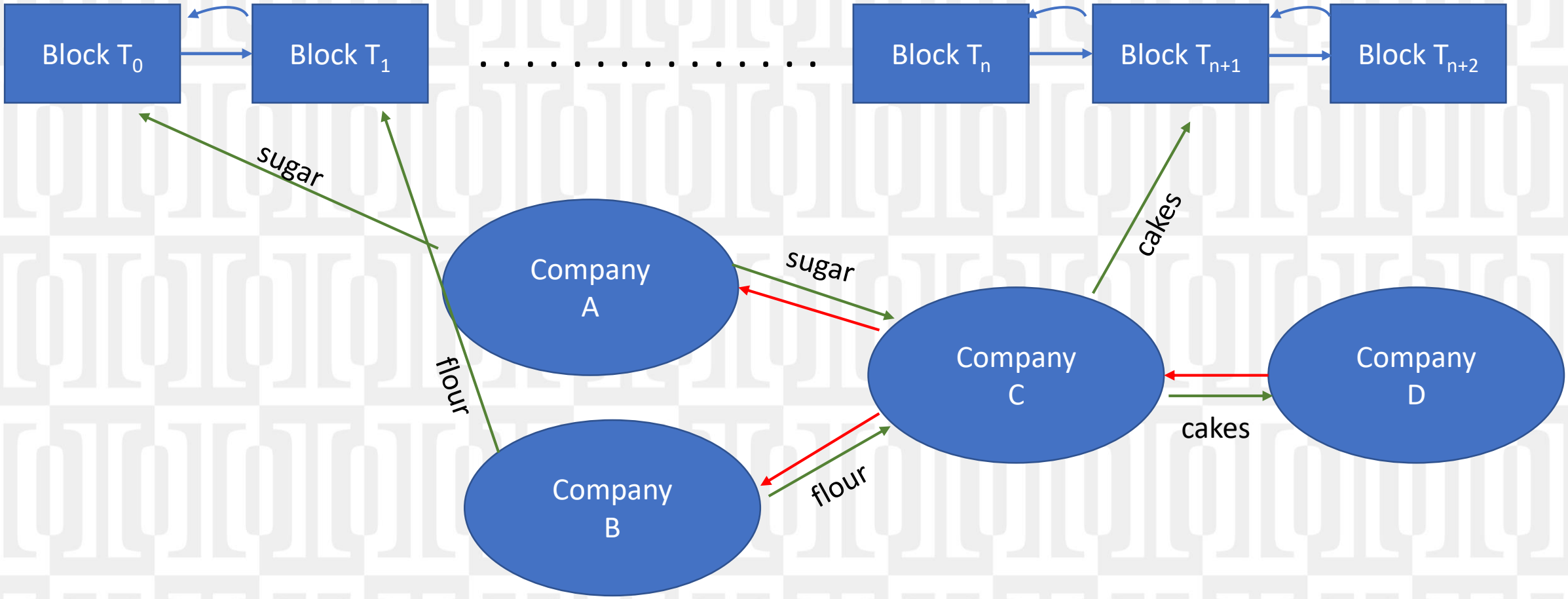


Figure 5-8 – The REA Metamodel (Independent View at MOF M2)



Transactions

Company D orders 100 cakes from Company C

Company C orders 40lbs of flour from Company B

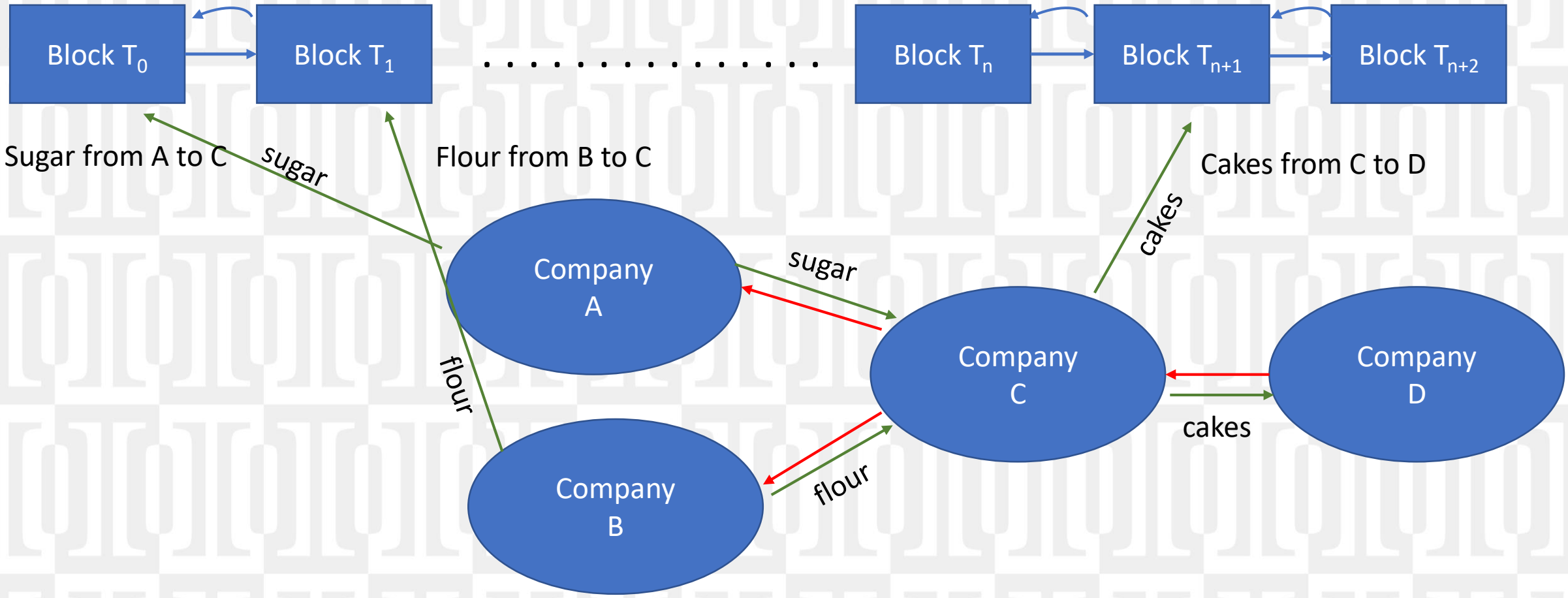
Company C orders 30lbs of sugar from Company A

Transactions

Company B ships 40lbs of flour to Company C

Company A ships 30lbs of sugar to Company C

Company C ships 100 cakes to Company D

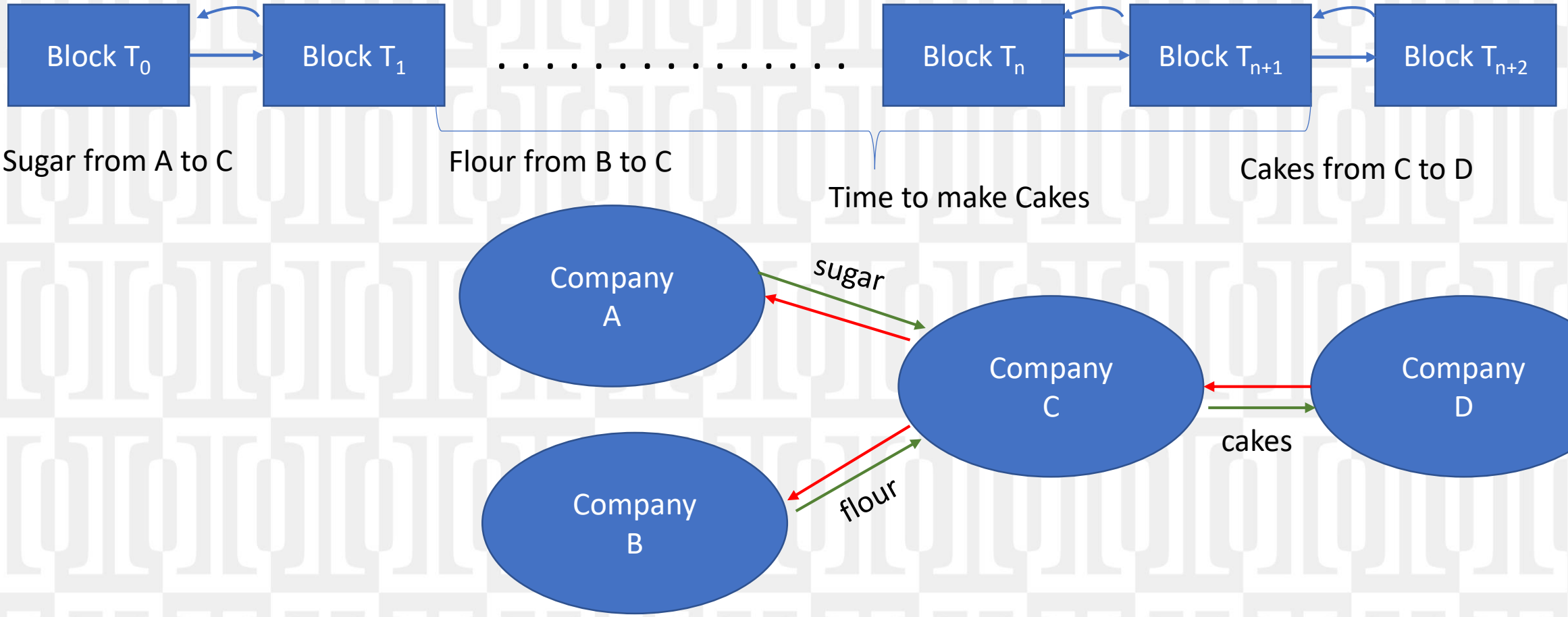


Transactions

Company B ships 40lbs (DB A/R CR Sales) of flour to Company C (DB Purchase –RM CR A/P)

Company A ships 30lbs (DB A/R CR Sales) of sugar to Company C (DB Purchase –RM CR A/P)

Company C ships 100 (DB A/R CR Sales) cakes to Company D (DB Purchase – FG CR A/P)



Transactions

Company B ships 40lbs (DB A/R CR Sales) of flour to Company C (DB Purchase –RM CR A/P)

Company A ships 30lbs (DB A/R CR Sales) of sugar to Company C (DB Purchase –RM CR A/P)

Company C ships 100 (DB A/R CR Sales) cakes to Company D (DB Purchase – FG CR A/P)

Issues in Collaboration Space

- Sales and Purchases are trading partner terms
- Debits and Credits are internal representations
  - XBRL syntax is not appropriate for blockchains
- Distributed Transaction Repositories change to auditing
  - Recipes become available (ingredient list and processing time)
  - Needs a Type Function
    - When flour is delivered the contract must be able to resolve that the flour that was delivered matches what was ordered

Original contract ideas from UN-CEFACT (AIAG example)