

# Financial accounting with REA

A framework for modeling phenomena of financial  
accounting with resources, events and agents

Advisor: Univ.Prof. Walter Schwaiger

# REA - Motivation

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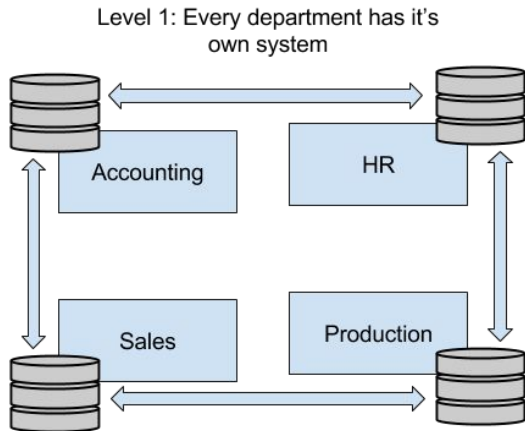
Initial Paper by William McCarthy, 1982

The rea accounting model - A **generalized Framework** for Accounting Systems in a **Shared Data Environment**

# REA - Motivation

Initial Paper by William McCarthy

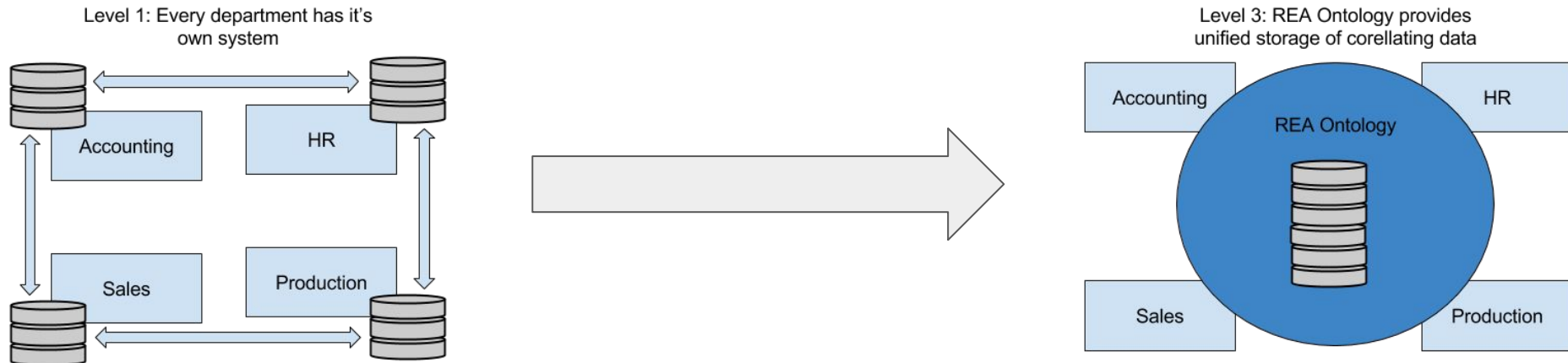
The rea accounting model - A **generalized Framework** for Accounting Systems in a **Shared Data Environment**



# REA - Motivation

Initial Paper by William McCarthy

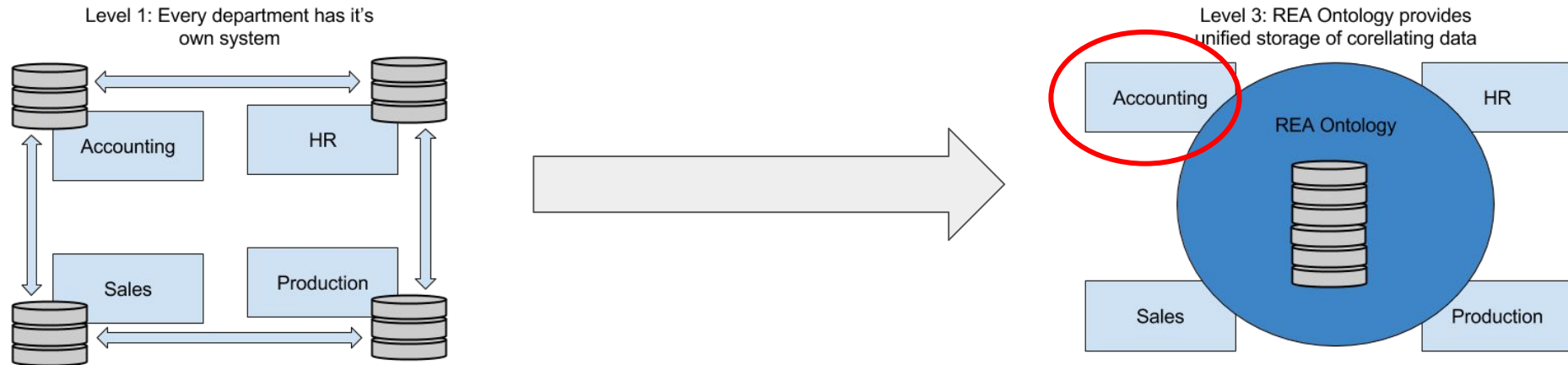
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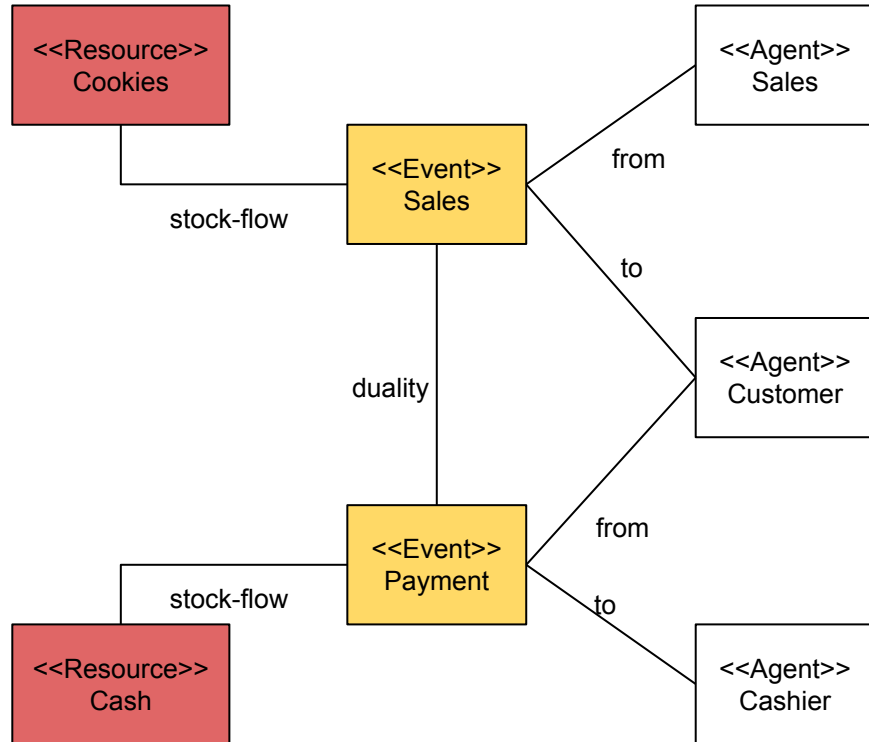
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The rea accounting model - A **generalized Framework** for Accounting Systems in a **Shared Data Environment**



# REA - Basic Example

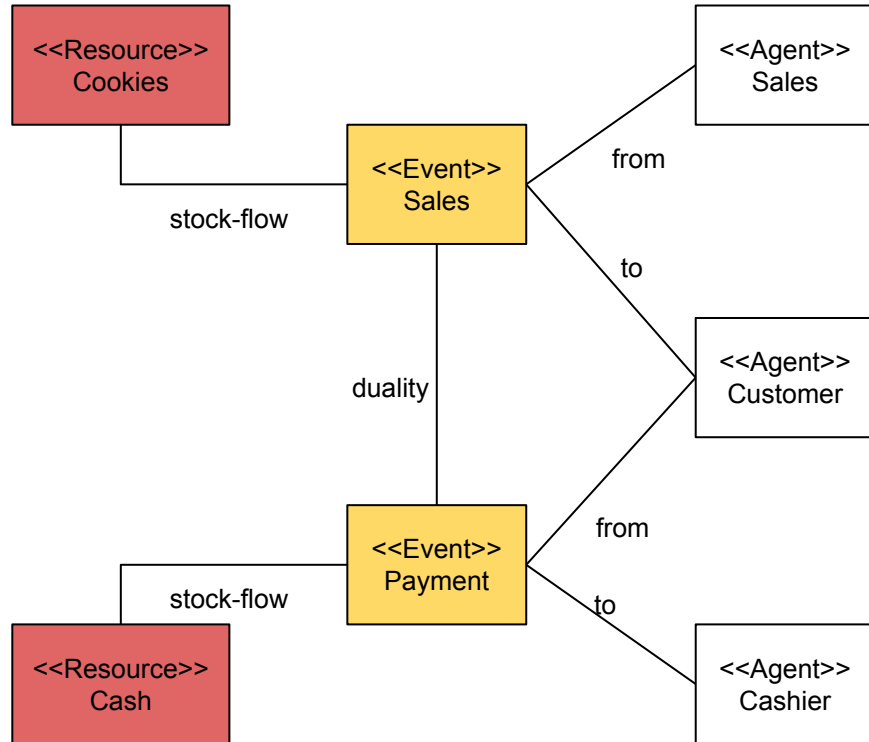
# REA Exchange: Basic Example





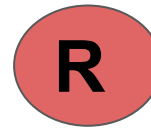
# REA Exchange: Basic Example

Principle: Value Exchange

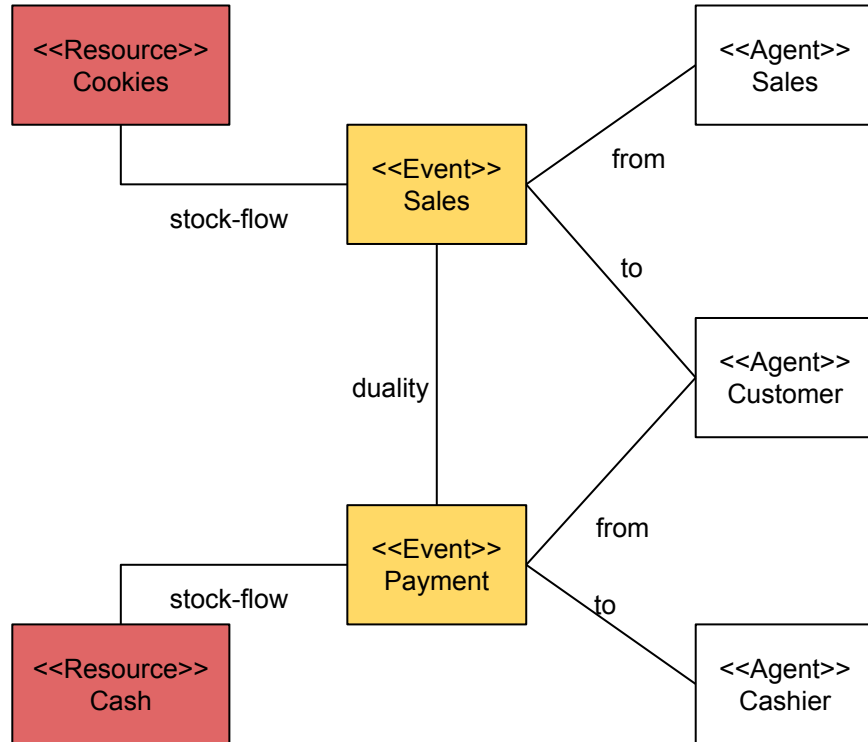


# REA Exchange: Basic Example

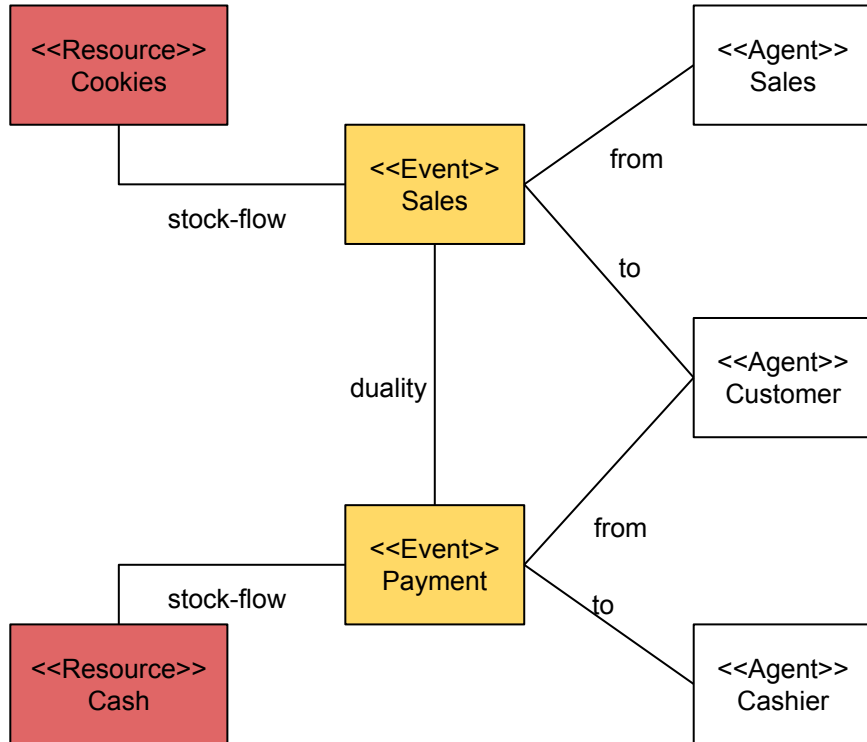
Principle: Value Exchange



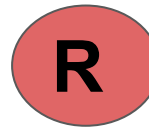
Resources  
What is exchanged



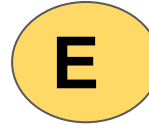
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Principle: Value Exchange

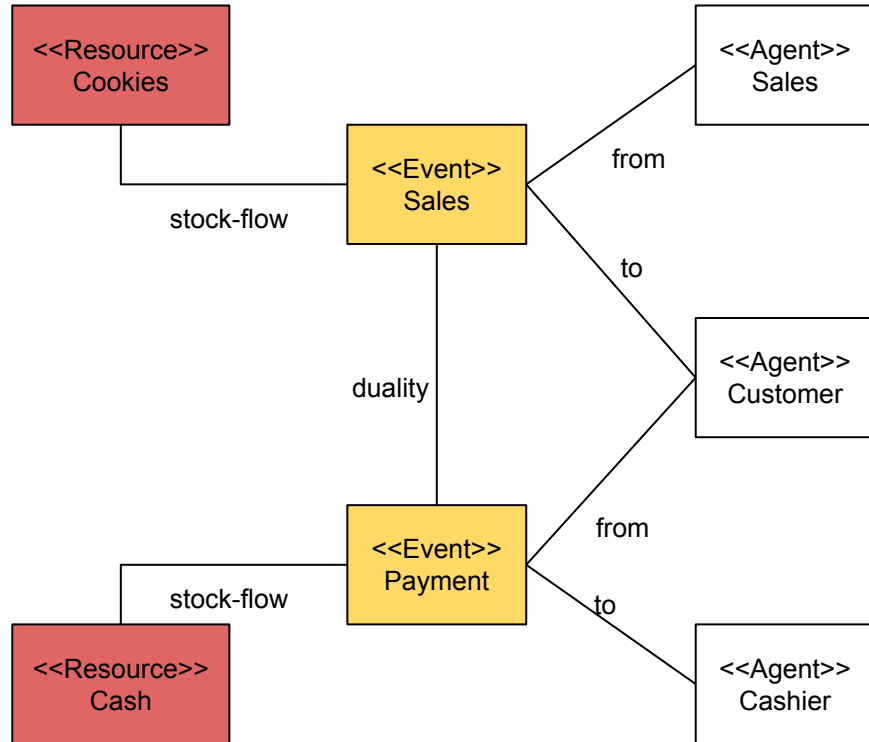


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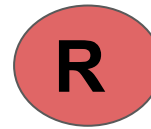


Events  
Why is it exchanged

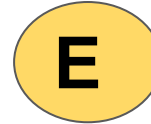
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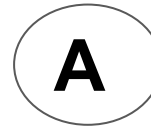
Principle: Value Exchange



Resources  
What is exchanged



Events  
Why is it exchanged



Agents  
Who receives / sends

# Financial Accounting - Balance Sheet

# ALE Accounting - Simple Balance Sheet

## Assets

- Properties
- Cash
- Inventory
- Accounts receivables
- Claims

## Equity

- Shares
- Retained earnings

## Liabilities

- Accounts payables
- Debt
- Provisions

# ALE Accounting - Simple Balance Sheet



$$A = L + E$$

## Assets

- Properties
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# Concept comparison



# Concepts comparison

## REA

### Resource

- A scarce good
- You can touch it => it's a resource
- Licences, Patents => it's a resource
- Claims => not a resource
- Liabilities & Equity => not a resource

### Events

- Log what happened

### Agents

- Model has independent POV

## ALE

### Resource

- Physical Assets - same
- Claims - it's tradable!
- Equity - Risk cushion for investments  
it's scarce!
- Liability - it's tradable!

### Events

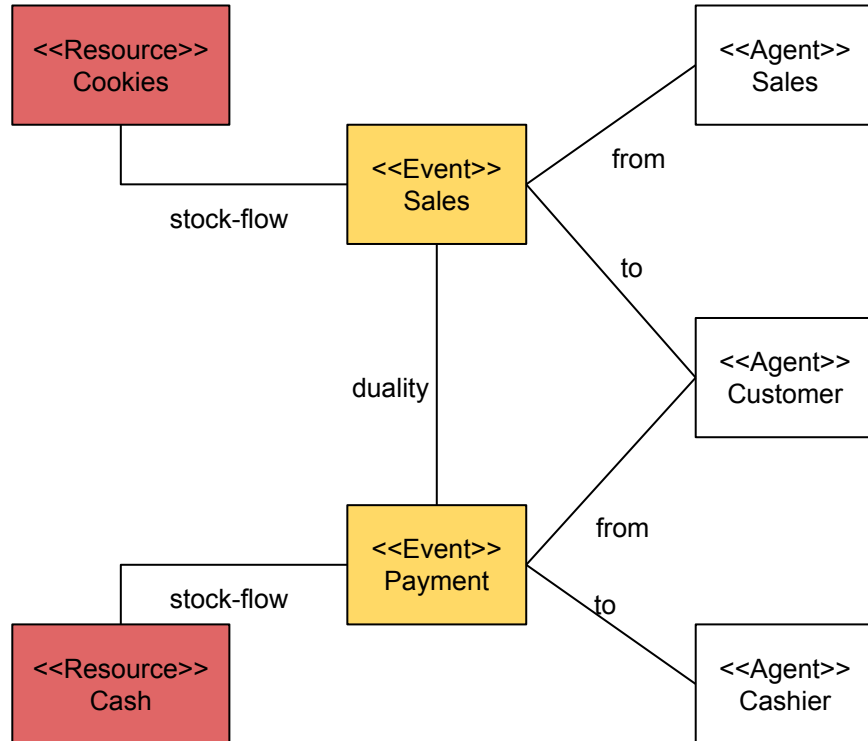
- with P&L effect change Resources and the  
Equity - isn't this a resource?

### Agents

- Company
- 3rd parties

Put it together

# How does that fit together?



## Assets

- Properties
- Cash
- Inventory
- Accounts receivables
- Claims

## Equity

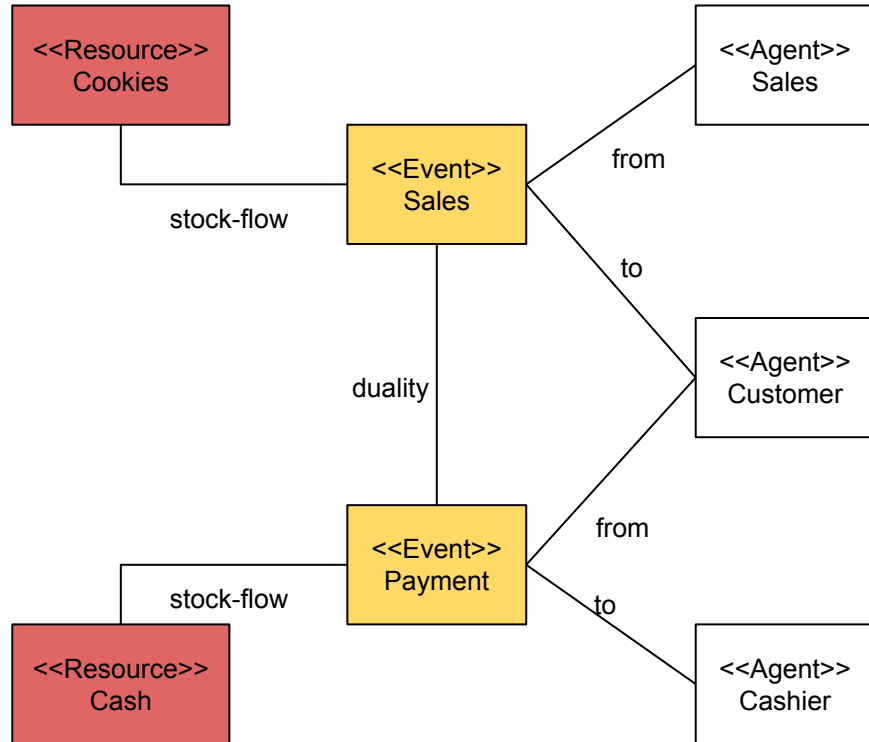
- Shares
- Income of the year
- Retained earnings

## Liabilities

- Accounts payables
- Debt
- Provisions

from [https://www.researchgate.net/publication/221912324\\_Inventories\\_Financial\\_Metrics\\_Profits\\_and\\_Stock\\_Returns\\_in\\_Supply\\_Chain\\_Management](https://www.researchgate.net/publication/221912324_Inventories_Financial_Metrics_Profits_and_Stock_Returns_in_Supply_Chain_Management)

# How does that fit together?



## Assets

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## Equity

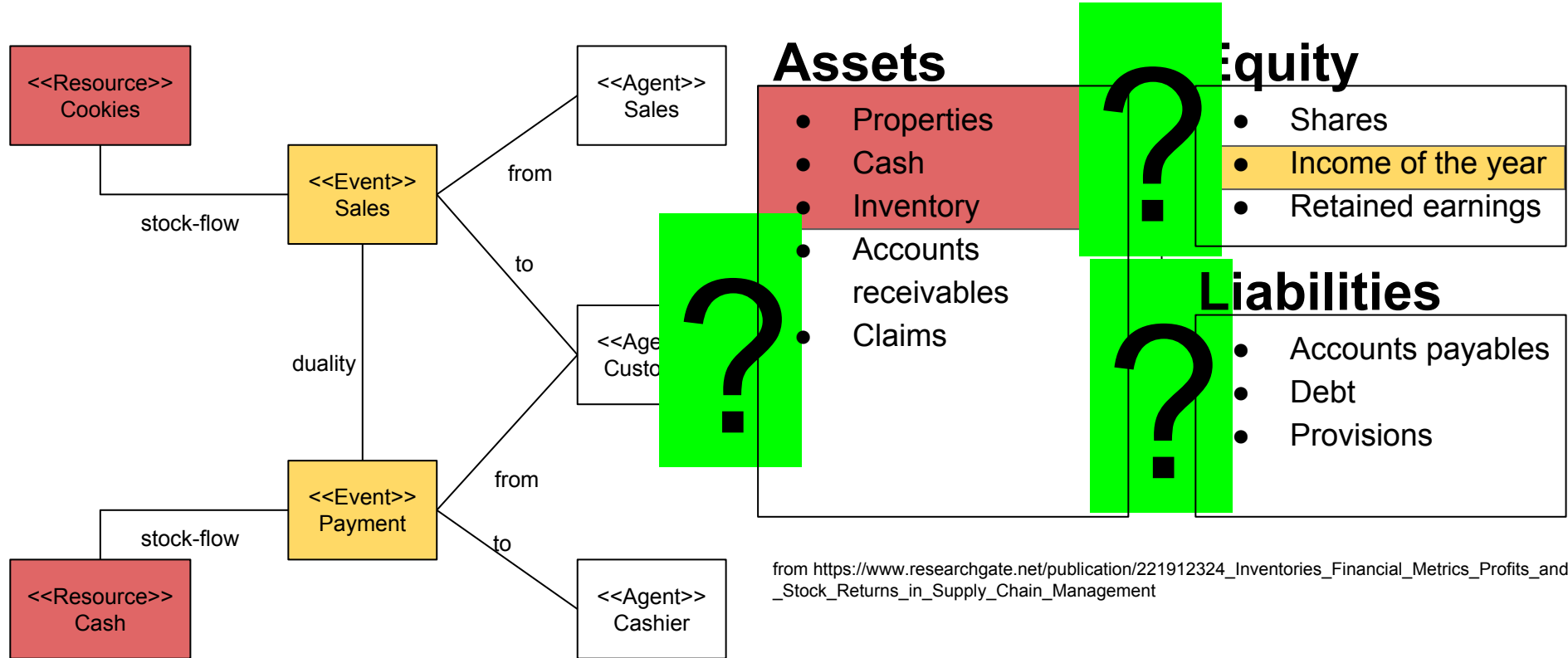
- Shares
- Income of the year
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## Liabilities

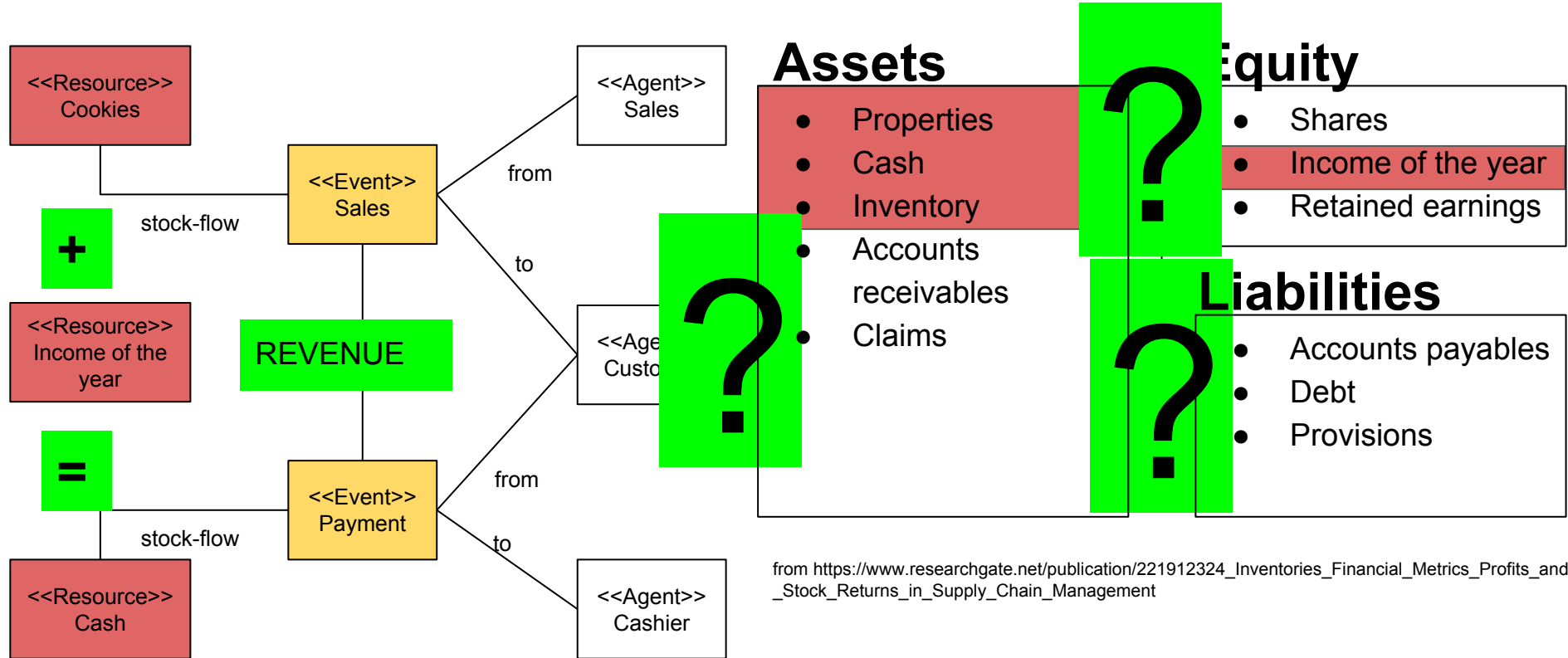
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# How does that fit together?



# How does that fit together?



# Concepts summary

- REA - Universal approach
- ALE Accounting has it's own notion

Research question



# Research question

How to enable Financial Accounting in REA?

- Completeness: Can all “features” of ALE accounting be expressed with REA?
- Semantics: What is a Resource, Event, Agent?
- Syntax: How to ensure ALE Equitation?

Outcome

# Expected outcome

- Complete model of ALE Accounting in REA with respect of IFRS

including

- Typification: Hierarchies to categorize resources, events and future events
- Constraints: ALE equitation in REA models
- Transformation: To initial REA; if Extension is needed
- Extraction: Restore T-Accounting Balance sheet

# Approach

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- Literature research
  - Formalisms of ALE Accounting / IFRS
  - Formalisms of REA
  - UML Modelling: Profiles, Constraints, Ontologies
- Case study
  - Coverage of typical ALE booking cases
  - Mapping / Extension
  - Constraints
- Framework
  - Complete Model for covered booking cases

State of the art

# State of the art

- Papers + Books about REA
  - Initial Papers (by McCarthy)
  - Policy layer (by McCarthy and Geerts)
  - Informations Systems domain
- ISO/IEC 15944–4:2007
  - Business transaction scenarios — accounting and economic ontology
- Research at Institut
  - Mainly with OntoUML -> Extensions of Events
- Study group at TU Vienna
  - REAList - More on MDE, REA as Storage Engine
- Workday: Proprietary SaaS ERP
  - Seems to use REA, talks only about “universal Object Storage”

# Thank You!

Questions?

Remarks?