Towards event-oriented and commitment-based conceptualization of economic exchanges in companies. Part 1.

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Abstract

An Economic exchange conceptualization is proposed for the development of practical AIS, including conventional accounting. It is based on Yuji Ijiri's Theory of Accounting Measurement [1], and the REA Ontology [2]. The conceptualization uses Unified Foundational Ontology (UFO) [7] and will be formalized with help of OntoUML editor. The issues of Entity (Company), Custody, Quantity, Price, as well as Time (Schedule) are explicitly introduced in the meta-model, which is represented as hierarchy of participation events. The multiplicities of Economic events in exchange and fulfillment relationships are restricted. The Exchange types (including Abstract, Infinite and Finite) are lined up in a hierarchy of types, with core processes such as income recognition and taxation. Exchange lifecycle phases, such as Offering are regarded, and typify and reserve relationships are reconsidered. Internal and external Economic agent assignment by Entity is elaborated. The table-oriented DSL is sketched. The classical Car insurance scenario is provided as an example of using exchange conceptualization for specifying interaction scenarios. Part 1 includes a semi-formal description of the main concepts and a more detailed class diagram of the market exchange, as well as the layout of the Economic exchange table (EXT) of the DSL. Part 2 examines other types of exchanges, their hierarchy, and specification and formalization issues.

Introduction

An Economic exchange conceptualization is proposed for developing practical AIS, including conventional accounting as conceptualization of exchange and accounting continues [2, 4, 6, 10 and 14].

The coordinated chain of economic exchanges comprises the operations of the firm. According to the [3] "The firm is any emergent community that the wider … community, through its relevant legal subcommunities, accepts as a member/occupant of the social position Sole Trader or Business Partnership or Limited Company. In this way the particular community in question is accepted as possessing the identity of being a member/occupant of the relevant social position, with a set of its intrinsic capacities interpreted as its associated function set. The capacities so interpreted are those that bear upon the coordinated production of goods and services to be sold to others, in a way that is intended to be advantageous to (at least some of) the community members, with (at least some of) that advantage interpreted as 'profits'.
A company, more specifically, is any community qua firm that the wider … community, through its legal subcommunities, accepts as a member/occupant of the social position Limited Company. In this way the specific community in question is accepted as possessing the identity of being a member/occupant of the social position Limited Company, and thereupon being a bearer of various associated positional rights and obligations … of owning various assets - such as real estate, shares, cars and boats - of making and being bound to contracts, of suing, being sued, and so on."

In short, we would like to emphasize several aspects of this definition that are related to Economic exchanges and to provide some classification of exchanges.
A firm is accepted by a wider community particularly by committing 1) Community exchanges with it, particularly in the form of taxes and regulations.
The firm (as Principal) through legal fiction and via authorized Economic agents (ultimately physical persons) controls Economic resources. Some of the firm's Economic resources are stocked for further expense or lent for further return by 2) Stockflow exchange.
The firm's Economic resources, together with its organization, which is formed by committing 3) Authorization exchanges (that create the internal positions/roles) with the Economic agents, form the intrinsic capacities (dispositions) that are reified in coordinated 4) Production exchanges and 5) Market exchanges – production of goods and services and market transactions, respectively, with the goal of producing profit for 6) Shareholder exchanges.
We will start with the general structure of the Economic exchanges and then view the more usual Trade exchanges and continue with the remaining exchanges in Part 2.

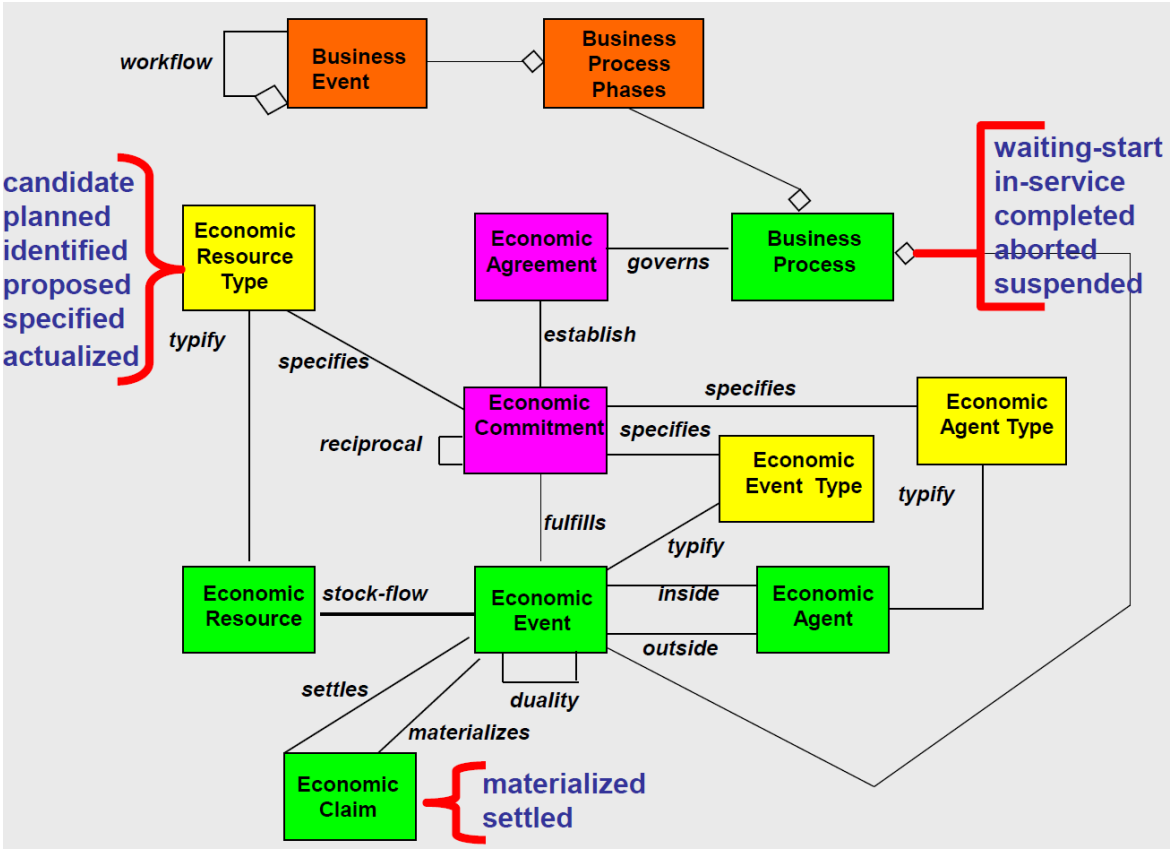

Fig. 1: McCarthy, William. Basic REA Ontology Concepts. "The REA Accounting and Economic Ontology – Its Use in ISO 15944-4 and Its Development as a Literary Warrant, Ontology Summit 2013 PowerPoint presentation."

The REA class diagram in Figure 1, illustrates a simple and informational picture of the objects and the relationships of a performed economic exchange, which has further potential for more practical use, such as AIS, modelling business and accounting procedures and even [guidelines for] workflows. While most of the enhancements have been listed in the works of REA authors [5, 12], the process of exploring the applications continues, as does the conceptualization of economic exchange and accounting. We see our main task and, hopefully, contribution in:

1. Taking a more exchange progression oriented view - from the offering to the terminator events, concentrating more on the foundation events[7] that have led to the relationships, namely the assignment of the Economic agents to their roles, the events of their participation and the duality of the economic agent as an actor and human resource that leads to the duality of an economic event and a business event, the duality of an economic resource as rights (as potential events), and physical objects and the different events of their transfer and acceptance, all in the context of the parthood of exchanges, events, resources and agents;
2. Forming an object oriented hierarchy of economic exchange types;
3. Aligning the EXT (our system) with the upper ontology UFO and use the OntoUML editor to formalize it and translate to OWL, Alloy, SWRL and other languages;
4. Providing a (table oriented) DSL for designers and end users and forming a catalogue of accounting and business exchange patterns;
5. Introducing explicit Quantity and Price and Schedule concepts that are the essence of economic exchange, grounding on Ijiri's works [1];
6. Regarding internal positions and agent assignments as possible Exchange types;
7. Regarding Resource control as possible Exchange types;
8. Introducing explicit types for exchanges with the community and company's shareholders;
9. Discussing some minor issues about the basic objects and relationships.

Participation event orientation

Regarding the event orientation of our approach, we view the company model as a discrete event system that according to [8] consists of:

- objects of various types, the dispositions of which may be triggered by
- events of various types occurring at times from a discrete set of time points;
- dispositions and causal laws determining the dispositional behavior of objects by relating disposition-triggering events and disposition-enabling situations with resulting state changes and resulting events.

Authors in [8] describe events as potentially complex (see Figure 2) and with possible duration.
Our view is that Economic events are rather complex. Dispositions are often expressed by resource control and agents' roles, but causal laws - by commitment exchanges. Participation and stock-flow relationships of [2] may are regarded thus as respectively agent and resource participation sub-events, Decrements are Principal participation events, but Increments – Counter principal participation.

We also take the position of [8] that all temporal properties of objects are defined in terms of the events they participate in, but all spatial properties of events are defined in terms of the spatial properties of their participants, thus excluding the Location attribute of the Economic events. In many cases though the custody transfer requires colocation of custodian, counter-custodian and physical resources.

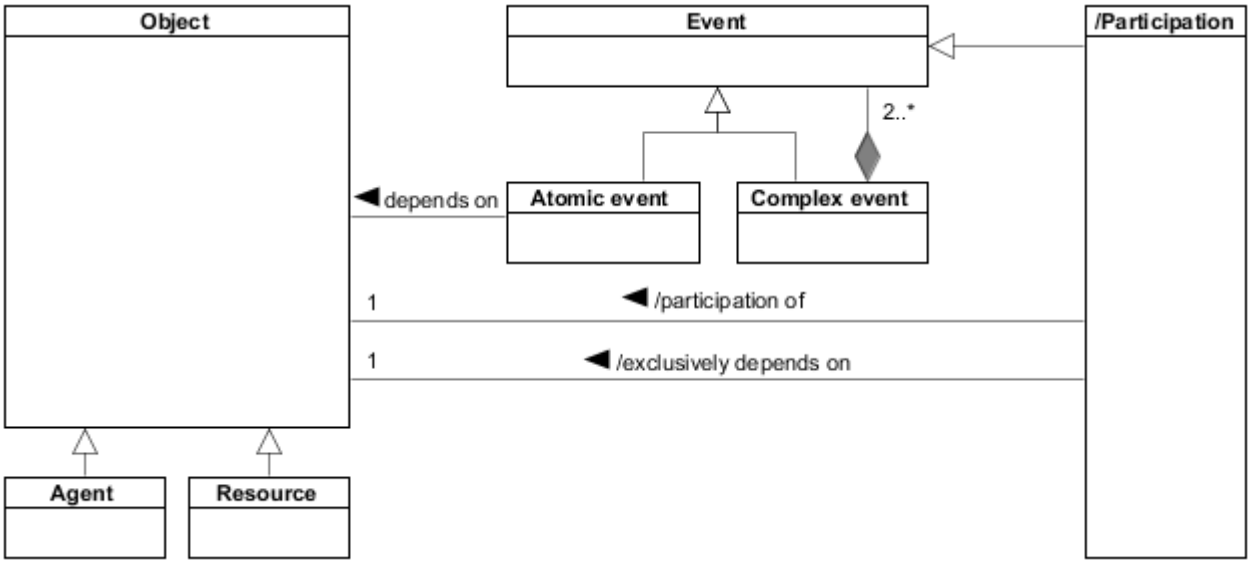

Fig. 2: Complex and atomic events. Adapted from [8], Agent and Resource added.

The Economic exchange viewed as participation event hierarchy is shown in Figure 3. Such a *uniform* view:

1) provides scaling – easy introduction/aggregation of Economic sub-events,
2) shows that To (+) agents participation is a consequence of From (-) agent participation,
3) allows for natural description of Human resource as measure of agents participation and
4) leads to Exchange type hierarchy.

An option would be to consider Agents participation relationship as 1:1 that would allow in EXT to fix the position of the Company's agent.

Economic exchange

According to [1]: "An **[Economic] exchange** is an action whereby the entity foregoes control over some resources in order to obtain control over other resources".

For our Economic exchange system purposes, we will need a more detailed definition:

An Economic exchange is a purposeful interaction typified by the Economic commitment exchange between the Principal (The focal Company) and the Counter Principal, and consists of:

1. The Decrement Economic event, whereby the Control (Power and Custody) over some Economic resources is transferred according to the Schedule from the Company by its Economic agent to the Counter's Economic agents.

2. The Increment Economic event, whereby the Control (Power and Custody) over some Economic resources is transferred according to the Schedule, from the Counter's Economic agent to the Company's Economic agents.

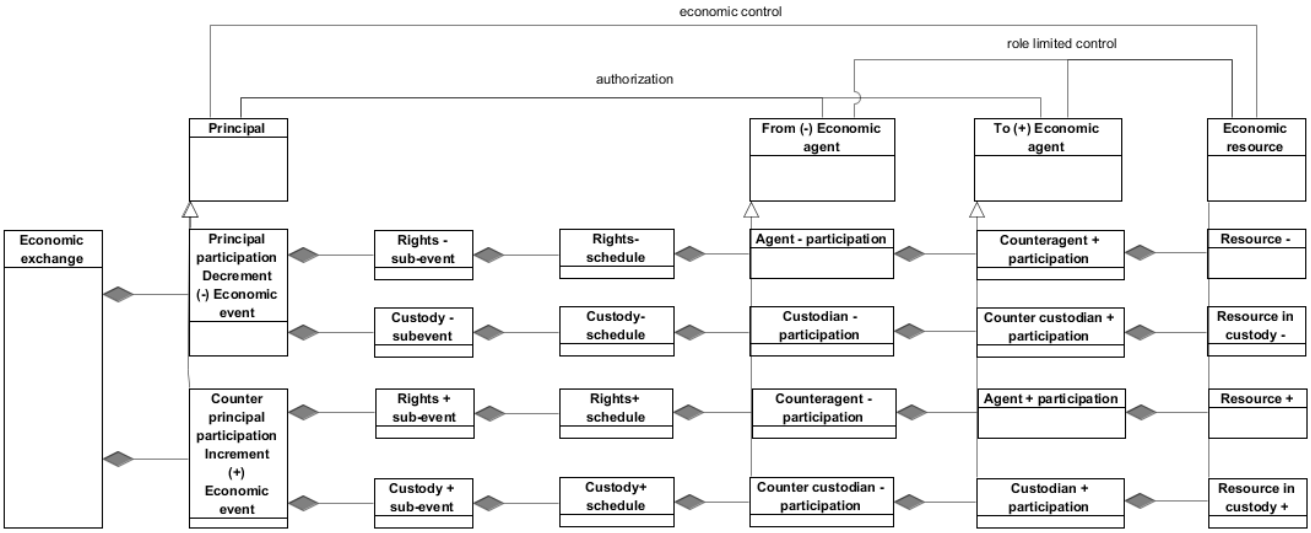

Fig. 3. The hierarchy of participation events of a performed Economic exchange

First example (the others will follow) of an Economic exchange is a purchase that happened in accordance with a Purchase order. The firm X (operating in EUR) today acquired materials from firm Y, who dispatched them on this day to the firm's X warehouse, for a price (plus VAT) in USD that is to be paid in 30 days to the firm's Y bank account.

Besides two principals who exchanged the control there are a custodian of Y who dispatched to custodian of X, and two other custodians who will do the bank transfer (Legally Bank is not a Custodian, but an Owner of "our" money, but our main model is not influenced by this difference). Two other dependent parties and exchanges here are: State (VAT) and Shareholders (Currency exchange differences). In principle the example exchange could be regarded as a barter, and we can notice that the valuation of the two sides of an exchange is not always equal, even for purchases. There can be another dependent exchange for the currency conversion and many other dependent exchanges - that issue we will cover later.

Notice that according to [1] a loan, rent, lease, and hence pledge, consignment, transportation are Economic exchanges too.

Economic event is: "identified by economic resources controlled by the entity and their changes" [1]. Also Economic event is Commitment typified complex action of an Economic resource Control transfer by an Economic agent within the Economic exchange.
Economic event may consist of the following sub-events: Rights (Power) transfer and Custody transfer, see Fig.3.

The Custody transfer is done instantly or during a time period by Custodian upon Controller's request or Schedule or other triggering event. The role of the Custodian can be played by an Agent, Self-service Counteragent, Human actor, Equipment or Software agent.
Controller is a Human economic agent who controls the asset (has the Power rights to it).
Regarding double entry of conventional accounting a Commitment-based Exchange would be represented by Causal double entry [1] and the Controller-Custodian balance by Classificational double entry [1]. The Rights may be also regarded as some type of Commitment for the Custody, even in the cases when Custody "arrives" first.
The transfer of the rights and especially the custody are actions that require some possibly minor actions of the participating Agents, these efforts may be regarded as Economic sub-events themselves consuming (employing) Human resource at least.
As a result of the Event Company gains ore foregoes the ownership, use or possession rights of the resource (that are defined by the type of the Event), the Agents that transfer get only their subset of the control, so here are two sub-events:

1. The transfer of the control to the Company
2. The transfer of the sub-control to the Agent, limited by her role or explicit assignment

The second sub-event is an Initiator of an Accountability exchange, the Estimator of which is determined by Agent's position or explicitly. Notice that each Event models transfer only in one direction, so the transfer between two Company's Agents are two sub-control events.

An object participating in an action is termed a Resource [7], so the object participating in an Economic exchange will be termed Economic resource.
Economic resources are: "objects that the entity intends to place under its control they must have utility and must be scarce, ruling out free goods.
…
Economic … control over the resources means discretionary power to utilize or dispose of resources. There are different levels of such discretionary powers." [1]
Control regiments the Economic exchanges of the Principal with the particular asset.

Custody is: "association between a Person and an economic resource where the Person has physical control only over the resource or controls access." [6]

The Economic resource that is currently under control of the Economic agent, even for a short period of time, is called a [Present] Asset. Future Negative and Positive Assets denote Economic resources that are expected to change control in the future, based on Commitments.

Each object in the EXT conceptualization is characterized as being part of some whole and by its type or role as being part of the whole type or role. Resource is a part of all Resources of the Company, or a Batch or Equipment or other Container that is identified, Resource has a type that is a role of the Resource in an economic cycle, and it is usually identified by a Quantity and valued with a Price. The valuation is regarded as a special sub-event and is done according to the rules based on [1], starting with the principle that:
"the bookvalue of assets obtained is set equal to the bookvalue of assets foregone".
Axiom of **Quantities** [1]: "All resources under the control of an entity at time t can be uniquely partitioned into classes of resources at that time or later in such a way that for each class a nonnegative and additive quantity measure is defined. This measure has the property that two sets of resources in the same class are treated as being substitutable in the uses of the resources if and only if their quantities are the same."

Economic agent is an Actor - a Legal or Physical Person capable (bearing resources) of carrying out the Economic events and having control and making Commitments, acting on behalf of herself or authorized by another Economic agent - Principal. The current conceptualization is from the viewpoint of a particular Company (slightly more concrete than "entity" in [1]) as the Principal. Economic agents are authorized and participate in Economic events according to the roles that regiment their actions. As [1] notes: "Entity's power to control resources is provided by someone else, who demands accountability in return."
The Counter Principal is an Economic Agent and may be the same as the Principal or Unknown in special cases.
The conventional accounting is not usually interested in the Initiator nor Terminator Agent, only in the Estimate one, that substantially narrows the description of the phenomena.
The whole for the Agent is a Community, Company or its Unit, the type is a role or position of the Agent.

[Economic] Commitment is an agreement to execute an economic event in a well-defined future that will result in either an increase of resources or a decrease of resources [1]. Similarly as in [13] the Agent's Commitment is a Counteragent's **[Economic] Claim** and vice versa.
We would like to add that the "well defined future" includes "upon request", so that the Commitment is not Conditional (or is Unconditional), if only well-defined time or Request is required for its execution. The Initiator event transforms the Conditional Commitment to Unconditional (also called Estimate [1]). There may be other "triggering events" [13] that causes the transformation, such as environmental or statistical. In our model these transformations are described by Causal laws of exchange and Schedule object.

According to [7] there are internal commitments (intentions), in our case of an Economic Agent, and social commitments, in our case between Agent and Counteragent. Economic Commitments typify Economic Events. Economic Commitments are reciprocal and form Commitment exchanges that typify Economic exchanges.

Notice that in our conceptualization an Agreement and a Schedule are an Exchange phase and a sub-event collection respectively, but not collections of Reciprocal commitments as in REA.

Economic commitments within Exchange phases are fulfilled by Economic events or by new Commitments or by a special Commitment called *Estimate* in [1] (or *Claim* in [2]). So the Economic event (or the new Commitment) has dual nature – it is an Event or Commitment per se and a Fulfillment event, since in our model the correspondence between them is 1:1, we do not need to model Fulfillments explicitly.

Economic market-based exchange

We will now proceed with a more detailed description of Market exchange, see Figure 4.
A Market exchange usually starts with a unilateral Meta commitment Offering, which consists of what we have called the Economic exchange type because it typifies the Agreement (Commitment exchange) and transitively the Exchange. In our Exchange type hierarchy, most of the Policies [2] are specified as Exchange types, which may be abstract. There are also *Alternative exchange and event types and Prohibited exchange and event types* that within some exchange restrict the activities, e.g., prohibit trade with specific Counteragent type or of specific Resource category or provide alternatives, such as ability to pay in cash or by bank transfer.

Offerings are communicated to the target community, so they are not abstract. The role of a committer of the Offering is called the Offerer. It is an Economic agent that has been authorized by the Principal or his authorized agents and has accepted to play this role in exchange for consideration. The authorization and the remuneration is, again, described by Economic exchanges that are not shown yet on this diagram (with the exception of the authorization association) and will be discussed later. The acceptance of roles, offerings, and deliveries are also not shown and will be regarded in Part 2.

The Agreement contains the Commitments and Claims accepted by the agents – the Committer and the Counter-committer and Claimant and Counter-claimant respectively. In a Company hierarchy, the Committers and Claimants that will actually execute are represented instead by higher level actors (e.g. Sales managers) whose task includes efforts to extract [11] Commitments from future participants of an Exchange (e.g. Logistics department) – internal and external and coordinate their future efforts (That constitutes an Exchange per se, that we will regard in Part 2).

Usually a Commitment is tied with another on the condition that the Conditional commitment will be estimated and executed only if the first one is executed. The commitments may specify concrete terms, resource types and quantities. We will call such commitments *finite* and need to determine whether the exchanges are *partitionable* (i.e. executed in parts).

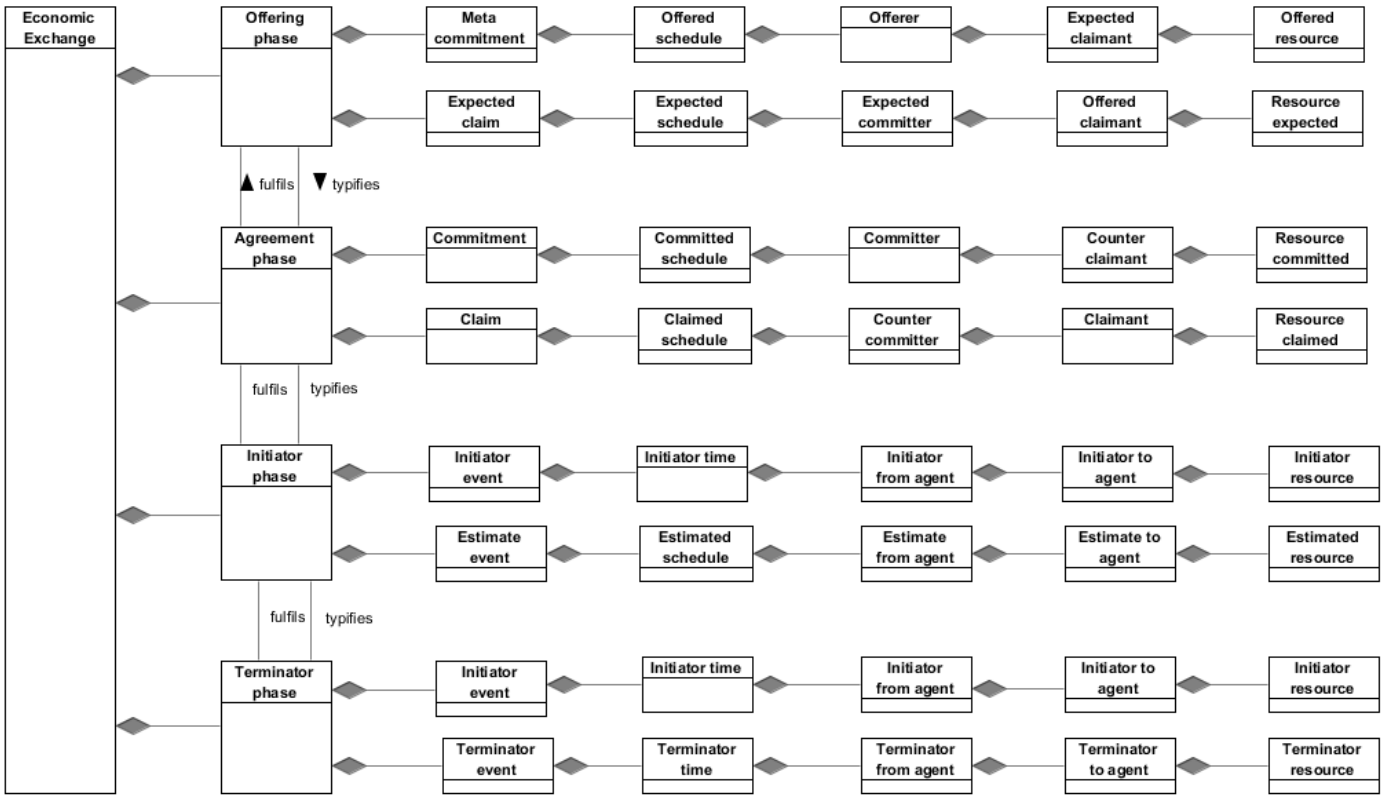

Fig. 4: UML Class diagram of the Market exchange phases and the participation events (Custody/Rights sub-events not shown).

Commitment exchanges (Agreement phase) that do not specify terms (but possibly specify sequence), or exchange quantities (but possibly specify proportions) or concrete Resources (but possibly specify categories), we will call *infinite*, examples are blanket orders, employment and banking contracts.

In accordance with the Axiom of Exchanges in [1] the fulfilment of Agreement phase starts with an Initiator event: ‘’Every change in the set of resources under the control of the entity can be classified uniquely as it occurs either as terminator of an old simple exchange or an initiator of a new simple exchange with an estimated terminator.

…

[Restriction 1] Let us call an exchange simple if its increment belongs to one and only one class of resources and compound if its increment belongs to more than one class of resources.’’

During the Initiator, Resource custody is transferred (we will ignore some exceptions for the moment). After acceptation, the Resource rights are transferred and the Opposite resource rights and custody are estimated (as in an invoice). Notice that the Estimate, but not Commitment nor Claim, typifies the Terminator event.

Now we may regard the “typify” relationship, that was introduced by [2] to reflect that Event, Resource, Agent types (roles) are specified by Commitment and the Economic event instantiates those types (with some caveats). It is true, but possibly more complicated than it seems. In some situations, the Event object instances are identified very early, as e.g. the instance of the Firm, but in other situations, they are left undifferentiated till the completion of the exchange. We would propose a <type, id> pair that progresses through the lifecycle as a typify relationship. We have found (see Figure 5) that typify relationships can be not only type-instance, but also the following type conversions:

- Type unchanged;
- Type to subtype;
- Type to instance;
- Type to enumeration;
- Instance unchanged;

And the following partitions [7], due to e.g. partial resource quantity fulfillment and concretization of agents:

- Whole unchanged;
- Quantity – sub-quantity;
- Collective – sub-collective;
- Collective – member;
- Functional complex – component.

Notice that the types for Quantity, Price and Period include intervals and over/under fulfilment tolerance amounts or percentages, and for their and instance presentation the pair <interval, tolerance> is sufficient, and the subset of the typify relationship is applicable.

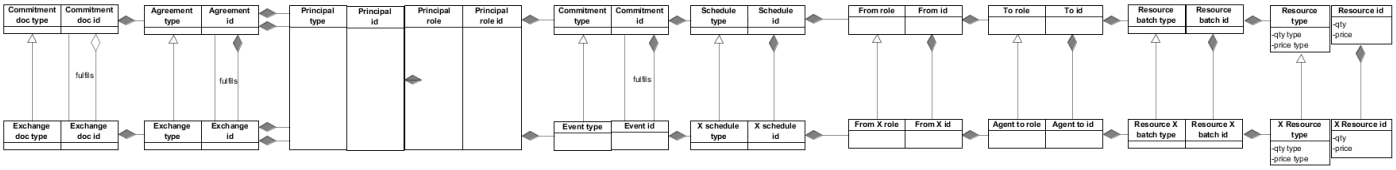

Fig.5: Subtype and "part of" relationships between Exchange phases detailing "typify" relationship ("X" – exchange).

Exchanges progress in phases as in Offering-Agreement-Initiator-Terminator as well as within phases. The phases may involve several sub-phases, where each subsequent phase fulfills and typifies the previous; a cancellation and rejection and other special cases such as returns will be covered in Part 2. A narrowing types and wholes progression of exchanges takes place most often such as purchase order processing, but another progression pattern is possible, when several Commitment exchanges are combined into one super-type and aggregated exchange that is executed and the results of which are distributed back, e.g. in requisition processing.

Exchange restrictions

Under the Exchange axiom, we cited the definition of a Simple exchange (**Restriction 1**) -
" Let us call an exchange simple if its increment belongs to one and only one class of resources and compound if its increment belongs to more than one class of resources''[1] which is important for the exchange to be Economic and to facilitate valuation.

It is equally important for the fulfillment to be Simple (**Restriction 2**) – to have only one Commitment exchange for each Actual exchange (the same also true for a Commitment and an Economic event), to be able to use it as a type and the Causal law to determine the Estimate, register exact fulfillment and accumulate "contract assets"[14].

Each Commitment exchange or Exchange type must have not more than one super-type (**Restriction 3**), to avoid multiple inheritance.

The Economic exchange must happen among not more than two Principals (**Restriction 4**) and may have optional dependent exchanges with the Community and Shareholders.

The Control transfer also has to be Simple (**Restriction 5**) – for each Asset we need to have only one Power for each Custody.

The Distribution has to be simple (**Restriction 6**) – for each Decrement there is only one Agent, but possibly many Counteragents, for each Increment there is only one Counteragent, but possibly many Agents.

These restrictions are not always in place in practice, additional rules have to be specified so that non-economic exchanges are converted to economic ones. We will discuss these rules in Part 2.

Economic exchange table (EXT)

Exchange types may reach several hundred in a SMB firm, which makes their UML presentation quite large. With such a large quantity, it is difficult to use variables and to manipulate specification views. For example, it would require special effort in e.g. for an activity diagram to change the lanes showing the Principals to showing all agents, or to switch from an Economic event/opposite event lane dichotomy to:

- Increment/decrement one or to;
- Initiator/terminator one or to;
- Control/custody one or to;
- Debit/credit one.

For a table oriented DSL, such transformations would be done by simple SQL statements. The reasoning becomes clearer on a formula or logic proposition basis, while the exchange structure is presented well enough in a table structure, which may be executed by a software system and transformed to standard Economic documents as shown in [9].

See Figure 6 as a transformation and example of Figure 4 and 5. We will now briefly describe the EXT table to be used in Part 2.

ECONOMIC DOCUMENT (d)				ECONOMIC EXCHANGE (x)			PRINCIPAL (p)			ECONOMIC EVENT (e)		FROM AGENT (a)		TO AGENT (b)		ECONOMIC RESOURCE (r)				
type	id	fulfils (f) type	id	type	id	phase	unit	id	role	id	type	id	role	id	role	id	batch	id	role	qty	price
ACCEPTED PO	*d	PO	*	PURCHASE	*	AGREEMENT	SUPPLIER	*1	SALES	*1	PURCHASE	1	SUPPLIER	*1	LOGISTICS	2	ACCEPTED PO	d	RAW MATERIAL	qty	price
											RECEPTION	1	SHIPPER	*1	WAREHOUSE	*	ACCEPTED PO	d	RAW MATERIAL	qty	price
							COMPANY	1	PURCHASING	1	PAYMENT	1	FINANCE AP	*1	FINANCE AR	*1	ACCEPTED PO	d	CASH	sum	1
											REMITTANCE	1	OUR BANK ACC	1	SUPPLIER BANK	*1	OUR BANK ACC	1	CASH	sum	1
ACCEPTED PO	1	PO	1	PURCHASE	1	AGREEMENT	SUPPLIER	1	SALES	1	PURCHASE	1	SUPPLIER	1	LOGISTICS	2	ACCEPTED PO	1	SCREWS	20	10
																			BOLTS	5	20
											RECEPTION	1	SHIPPER	1	WAREHOUSE	2	ACCEPTED PO	1	SCREWS	20	10
													SHIPPER	1	STORE	1	ACCEPTED PO	1	BOLTS	5	20
							COMPANY	1	PURCHASING	1	PAYMENT	1	FINANCE AP	1	FINANCE AR	1	ACCEPTED PO	1	CASH	300	1
											REMITTANCE	1	OUR BANK ACC	1	SUPPLIER BANK	1	OUR BANK ACC	1	CASH	300	1
ACCEPTED PI	6	ACCEPTED PO	5	PURCHASE	1	INITIATOR	SUPPLIER	1	SALES	1	PURCHASE	1	SUPPLIER	1	LOGISTICS	2	ACCEPTED PO	1	SCREWS	20	10
																			BOLTS	5	20
											RECEPTION	1	SHIPPER	1	WAREHOUSE	2	ACCEPTED PO	1	SCREWS	20	10
													SHIPPER	1	STORE	1	ACCEPTED PO	1	BOLTS	5	20
							COMPANY	1	PURCHASING	1	PAYMENT	1	FINANCE AP	1	FINANCE AR	1	ACCEPTED PO	1	CASH	300	1
											REMITTANCE	1	OUR BANK ACC	1	SUPPLIER BANK	1	OUR BANK ACC	1	CASH	300	1
BANK TRANSFER	3	ACCEPTED PI	6	PURCHASE	1	TERMINATOR	COMPANY	1	PURCHASING	1	PAYMENT	1	FINANCE AP	1	FINANCE AR	1	ACCEPTED PO	1	CASH	300	1
											REMITTANCE	1	OUR BANK ACC	1	SUPPLIER BANK	1	BANK ACCOUNT	1	CASH	300	1
			8	PURCHASE	1	TERMINATOR	COMPANY	1	PURCHASING	1	PAYMENT	1	FINANCE AP	1	FINANCE AR	1	ACCEPTED PO	3	CASH	500	1
											REMITTANCE	1	OUR BANK ACC	1	SUPPLIER BANK	1	BANK ACCOUNT	1	CASH	500	1

Fig. 6: A fragment of an Economic exchange table (EXT).

The Economic document may *union* phases of several exchanges that are fulfilled within one process, EXT contains the type descriptions of the documents (see ACCEPTED PO with id = "*d") as well as their instances (id=1). Notice that all instance identifiers (id) are presented as numbers within their types for reading convenience.
EXCHANGE column contains the type that is defined within the EXT above (not shown) and id of the exchange and the phase name.
The PRINCIPAL column holds the two principals for each trade exchange, their Business units (or Company or Community) and the role and the ids for those.
The ECONOMIC EVENT column contains event type defined above and an id. As mentioned previously the EXT may be presented as two Event lanes – adding the Opposite event or Custody event, agent, counteragent and resource to its heading, or form some other user preferable (and updateable) view. Each Event has a control part for the rights transfer and another part for the custody transfer (e.g. PURCHASE and RECEPTION).
The SCHEDULE column contains Calendar, Period and sequence for the Events or Commitments, not shown on this example.
The FROM/TO AGENT columns contains the role and the ids for agents that are also the references to the possible Exchange types.
The ECONOMIC RESOURCE column contains Resource batch or identity type and id, the Resource type, Quantity with UOM and Price per unit.

The text literals in EXT are written with the capital letters, while the variables and functions in the lowercase, special variable names for the current line exist that are mentioned in the EXT heading. For the opposite events, "o" is added,

and “c” is added for custody events e.g. “aoc”. Validation and calculation formulae may be specified with some special functions that will be covered in part 2.

When id or Quantity of concrete objects of exchanges, events, agents, resources is not known (even in the Initiator or Terminator phases), the cardinality of member events is used instead, such as *1, 0..1, 1..* ,* or more precise such as 100.00..200.00. The Quantity for the objects other than Resource is permitted, such as e.g. “*231” participations of Counteragents or “*123” Sales exchanges performed. Of course, such aggregated Exchanges are more appropriate for budgeting and constrains than for usual transactions.

The lines of the table (after the PO type specification) show accepted purchase order (PO) Commitments with Custody transfers due. Next lines show the fulfillment of PO by accepted invoice (PI), with the materials reception and forming of their Control and the Opposite estimate. The last group of lines shows the completion of several PO fulfillment, concluding with the Bank transfer paying several invoices as Terminator. Notice that the Bank transfer document could play the Initiator role in case of prepayment.

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