Transaction Shared Semantics Notes

Monday 30 Jan 2012

# Executive Summary

This note covers the background to the January session, an overview of the questions we looked at (these are reiterated in detail), and some further development of the thinking. Follow-up emails and responses / reactions are also included.

Some of it is a bit stream-of-consciousness, this is not intended as a tidy formal report but a real time exposition of the thinking we are working through.

Several outstanding questions are resolved in this document, both in the session notes and in the follow-up thinking which is included here. The follow-up thinking is offered for review, correction, improvement, objections and so on, and there is still a way to go.

Labeling is a separate issue, and is also addressed here; however, the meanings of things and what words we choose to call them by should always be interpreted as being separate and distinct questions. Once we get the meanings right, we can always improve upon the labels. Some improved labels are suggested here.

Some actions and corrections to the FIBO model are identified here, which should be implemented before our next session on 27 February.

## References

1. ontology-driven-standards-development\_REA--BillMcCarthy\_20080605.ppt
2. Diagram pack accompanying this note

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# Session Summary

We looked at this picture:



This is a rough and ready attempt to segregate a few of the concepts we need to deal with in reconciling REA, double entry and the FIBO high level legal terms of commitments and rights. Briefly:

* There is a thing
* There is some viewpoint from which that thing is viewed
* There is the question of whose viewpoint that is
* There are reports which are a report on the thing from the viewpoint of that party
* There is the thing itself as seen “in the round”
* Also, as someone noted, one viewpoint is the one we are seeing the ‘thing’ from here, namely the overview or ‘in the round’ viewpoint

(that last is a bit like in fiction writing where the writer may write from the perspective of a given character, or enter into what the experts call ‘omniscient’ narrative mode. )

In this case, the thing we are looking at viewpoints on is the transaction.

# Session Discussion

Details of the diagrams we looked at are in the diagram pack.

The questions we looked at are, briefly:

* Rights and Obligations Parties
* Contractual rights and commitments
	+ Including the reciprocal relationships between rights and obligations
* Sides – things seen from one or another perspective
	+ We did a little tour of the existing “Perspectival Thing” concepts
		- See “Parties Applications”
	+ Examples include:
		- Debt and Credit – the same thing (money lent) seen from the perspective of the lender and the borrower
		- Transaction sides
		- Nostro and Vostro accounts
			* There is some doubt if these are themselves perspectival things, since each exists as an “Account” in its own right; what’s perspectival is the positions recorded therein
	+ I wanted to think of a better word for “Perspectival Thing”, this having been a made up term for some thing seen from some perspective
		- I suggest “Aspect” covers it.
* The REA model concepts of Event
	+ See Slide 9 (replicated below).
	+ Actually each of the two events of a transaction has itself two sides
	+ So either the FIBO “Side” concept does not apply to this, or it applies twice
	+ It is possible that the FIBO concept of “side” and the REA Event are saying the same thing in different ways
		- Can or should one be described in relation to the other?
* Accounts
	+ Nostro and Vostro accounts
	+ Accounting conventions
* The role of “Report”, including XBRL reports
	+ Possibly an “Account” is itself a kind of report
	+ Accounts are also reported on in XBRL Reports, with additional report-specific information about time frames, reporting conventions and so on.
* Credit Facilities
	+ In the context of how movements of value are reported, we also looked at the Credit Facilities model (developed as part of Loans modeling).
	+ Things are reported differently by different kinds of accounting records

## Details

### Rights and Obligations Parties

New diagrams developed for this week. These add parties to the specific rights. Although the OWL notation does not let us apply rules about these, it is possible to define that for any given obligation there is a party who commits to that obligation, for any given right there is a beneficiary of that right, and that where these are reciprocal, the party which has the obligation is obligated to the party which enjoys the corresponding right.

In the second, extended version of this diagram, we add the contract-specific variants of these concepts (since all concepts are abstracted as far as possible, so we are not only modeling contractual rights and obligations, and therefore not only modeling transaction rights and obligations, which themselves have a contractual basis but are not the only kinds of contractually conferred rights and obligations).

In the case of contractually conferred / incurred rights and obligations, the parties which are the oblige and beneficiary of the obligations and rights are also the parties to the Contract.

### Rights. Commitments and Obligations

The upper level “Legal” grammar applies, and in particular the recently developed diagram of “Conferred Things”.

There are relationships between Right and Obligation. There is some question as to whether all obligations correspond to a right and vice versa. We could say that for a Right, it does even if the obligation (in many cases simply a legal “duty”) is itself too abstract to record – for example the right to enjoy some benefit unmolested incurs the almost trivial obligation not to prevent the party concerned from enjoying this right. Recall that the semantic model follows the Open World Assumption – it is enough to assert a fact, if it’s meaningful, without ever expecting to see data for it. For example, an Event always has a cause by definition, but need not always have a known agent (indeed, when there is, this generally makes it the kind of event that is an Activity or Act). So it is not problematical to say that all Rights correspond to Obligations and vice versa.

A related matter here is that of rights which the beneficiary of that right is in no way obligated to take up. This is the fundamental nature of that which defines an Option in financial derivatives transactions.

There is also the question of unilateral Obligations, for example in a pledge, donation and so on.

### Sides and Perspectives

The intention here is to define “something as seen from some perspective”.

This would appear to be a “Relative Thing”. We will explore whether this partitioning works, and what is the third order thing in which this applies. See “Development” below (post-session thinking).

### REA Event

In the light of the “Side” question, we looked at the REA Slide 9 model. The concepts shown here as “Events” are not yet in the FIBO model. Where and how do these correspond to “Side” if at all? Do these make “Side” redundant, or can we formally frame an event as being a side of a transaction? What about the sides of the event?



**Slide 9 (from Ref 1)**

Here we see that there are two dualities:

1. The Transaction has two sides which are (for general / retail transactions) a Shipment and a Payment side
	1. These correspond to “Legs” in OTC derivatives
	2. The terms disposed under “Transaction Side” throughout FIBO correspond to these, e.g. the Payment and Delivery side of forwards, options and so on (Swaps are more symmetrical).
	3. The terms given here are specific to general market transactions but that’s a labeling matter; more general labels can be sought but the fundamentals of anything which is a transaction are here
2. Each side has two perspectives from which it is seen
	1. These are the perspectives from which some report would be made by that party
	2. These are the perspectives reflected in double entry book keeping accounts

### Accounts

Nostro and Vostro accounts:

In fact, though this is not reflected in FIBO at present, these are only defined in what are “Correspondent Banks”. Otherwise you don’t see them.

**Action:** MB didn’t know this, so revise the model to reflect this (see “Accounts” diagrams)

**Key finding:**

One fact about any account is the basis on which it is maintained (cashflow versus accrual for example). Different firms might maintain accounts on a different basis.

For example, when you consider the movement of value represented by the movement of the goods in a transaction for sale and purchase of goods, the recipient might post this right away when the transaction is enacted, or might post it when the goods are received at Goods Inward or elsewhere.

This means that if you were to consider the accounts of the two parties in a transaction, each of their ledger accounts reflecting their perspective on that transaction could not necessarily be compared. You cannot compare like with unlike. So even when the two parties are considering the same side of a transaction from their two perspectives, the ways in which their records reflect this may differ.

Conclusion: for this reason, it’s important to separate out the record from that which it is a record of. The two records of the same thing (same REA Event, same transaction side) need not be comparable, but event so reported on is the same event.

### Reports

Reports differ from accounts in that an account records things at the point at which they are posted, whereas a report (for filing or other regulatory purposes for example) reports on a set of this accounts, for a given party, over a given period of time, and with other report-specific features.

These features include accounting conventions (accrual conventions and the like).

XBRL documents need not be reports on accounts; the message architecture supports a much wider range of possible reporting contexts.

We did not look at this in detail. See notes in previous section on Account.

### Credit Facilities

Considering when and how the events in each side of a transaction are recorded, we looked at this in the context of Credit Facilities. In a simple retail context there is a credit facility, but no obligation on the part of the potential lender. In some contexts there is a formally negotiated Credit Facility. Does the bank record this as a liability at this point (because it can be called upon) or only at the point at which the Credit Facility is drawn down as a Loan? Opinions (and presumably practices) differ on this.

# Development

Developing this after the session.

What we aim to get to grips with is:

* Abstraction
* Partitioning

That is, what are the most abstract concepts, the concepts specific to (all) transactions, and the levels in between; and how are these concepts to be disposed within the model partitioning (specifically the first- second- and third-order thing partitions). We hope that by partitioning these things correctly, we can describe the different views of transactions and their parts in relation to each other, specifically the REA view and the double-entry book-keeping view.

A strong philosophical claim is that anything which can be defined can be defined in terms of one of these three partitions. If we find ourselves wanting to define high level primitive concepts that do not fall under these, we had better have good reason as we would be claiming some philosophical discovery. This is unlikely.

It’s worth keeping at the top of our minds some example of these partitions, as it is easy to lose sight of these.

**First Order:** A “thing in itself” for example a wheel

**Second Order:** A thing in some role in some context, for example the nearside front wheel of a given car (this is a “Part”, which is a kind of second order thing); the trap to avoid is considering something which can be e.g. a part, as being defined as a part. The same goes for “Parts” (same word!) in a contractual relationship.

**Third Order:** the context in which a given first order thing is defined as being that second order thing.

This third order is useful for defining business contexts, for example it is in the context of securities issuance that a given Business Entity (1st order thing) is defined as the “Issuer” (2nd order thing) of a security. In the wheel example, the Part of Nearside Front Wheel is defined in the context a “Car”, which is a kind of System (a 3rd order thing) and indeed it is the existence of parts which defines the difference between a system and a collection of stuff. But the system can also be described and delivered as a Car.

Generally, any 2nd Order Thing has a relationship of “identity” as some 1st Order Thing. Similarly, and 2nd order thing has a relationship of “defined in the context of” to some 3rd order thing.

However, we can question whether these relationships always apply as stated here: in fact, some second order things may turn out to be defined in terms of some other second order thing (for example, the beneficiary of some Right may be defined as being some Contract Party, itself a relative thing (Party). Similarly, we may want to question whether the context in which some 2nd order thing is defined, is always a 3rd order thing.

## Applying This

What we called ”perspectival Thing” is an aspect of a thing. We shall call it Aspect. This also allows for more than two aspects to a thing, with a side being a kind of binary aspect to a two dimensional thing.

A transaction is a two dimensional thing.

Side could be the side of a coin; debt v credit and so on.

Aspect is whatever aspect of a thing is reflected in some Account or some Report.

Aspect is a second order thing

That which is the context in which it is defined, is the thing of which it is an aspect.

Whereas “Part” is a second order thing of which the third order thing is a “System”, and a “Party Role” (also called Part in contracts) is a second order thing in which the Third order thing is a business context; Aspects do not add up to some system and are not some context in which some role is played. Instead, the context in which an aspect is defined is itself a first order thing.

It may be realistic to state that any second order thing the context of which is a first rather than a third order thing, is what’s defined as an “Aspect”. This is its defining feature.

A transaction can be defined from the perspective of a buyer or a seller (in the simplest case of a transaction for sales; we can generalize this later). Seen from the perspective of a buyer, the transaction is a purchase; seen from the perspective of the seller, the transaction is a sale.

That is, any aspect of a transaction is defined as from some perspective. A necessary property of all aspects then is that they must be from some perspective. That is, an aspect has an object property of the form “from the perspective of”.

Is this always and necessarily true of “aspect” at the most general level? I would suggest so; for example in the case of a concrete thing such as a coin, the perspective is literally a visual perspective. For abstract things, we use the metaphor of visual perspective because abstract things can only really be apperceived by means of metaphors about concrete things.

Then a Sale and a Purchase are Aspects of a Transaction.

In REA there (per Slide 9) the Shipment and the Payment. These are not Aspects in the sense given above, but are distinct Events. Receiving or delivering are Aspects of each of those sides.

Again, we will generalize this later to cover Swaps and the like, but the generalization will only require us to more general words than those which are applicable to a sales transaction, they do not change the principles.

Now, each Transaction, whether perceived from the aspect of it being a Sale or a Purchase, has itself two parts, because a transaction is an exchange of two movements of value (typically but not necessarily one of cash and one of goods or services).

More generally, the Sale and the Purchase aspect (in the sales transaction example) are two Sides or Aspects of the same Transaction Event.

One term for these is Side, a term used widely in financial industry transactions. In Swaps, kinds of Side (in this strictly 2nd order sense) include payment and return legs (in Swaps, Leg is a synonym for Side, but it may also be used in a first order sense, like that wheel, so we will avoid this label for now).

It goes without saying that a Ledger account is a “Record”, being the record from some viewpoint, of some movement of value. Since a Transaction comprises two movements of value, there are two reports of the corresponding movements, as corresponding credit and debit records in two suitable ledger accounts.

A Transaction has two sides, per the two perspectives; but it also consists of two Events. This is a separate duality. Other double entry book-keeping events are also pairs of events seen from separate perspectives, but may not all relate to transactions. We can come back to that.

The two Events, per REA, are each seen from two perspectives. This is clearly articulated in Slide 9.

From the perspective of the Seller, keeping to the sales transaction example, one of these events is Payment (to the seller) and one is Delivery (by the Seller). From the perspective of the Buyer, these same two events are described again, this time from the opposite perspective.

Taken in the round (helicopter view), these two events may be described, without recourse to perspective or aspect, as a Payment and a Delivery. This is the same in Forward and Option contracts and others. A Payment is an independent thing; so is a Delivery. A Payment to Elmo is a relative thing, and so is a delivery by Elmo. A payment from the Cookie Monster is a relative thing, and so is a delivery to the Cookie Monster.

And so we have it:

The two sides of a Transaction are Events (per REA). They are not perspectives or aspects; they happen, no matter which way you look at them. The relative aspect consists only in the description of these from the perspective of one or other of the parties to that transaction.

The current implementation in FIBO is a mistake. What we have as Side (of a Transaction) is really Event. That is, payment and delivery are Events, and are First Order.

An Event in a Transaction, when defined explicitly from the perspective of one or other party, is then an Aspect. This includes for example Payment Leg and Return Leg in a Swap – to the other swap party, these are labeled the opposite way around.

Then, the things we have defined as legs in terms of their contractual terms, are not incorrectly styled as “Leg” if Leg in this sense is the REA-type Event. For example, an Interest Leg is an interest leg whether or not you are the payee or payer of that leg.

**Actions:**

The model is to be changed such that every side of a transaction which is described in terms of what it is, its nature, is indeed a Side, but is not a 2nd order thing, it’s a sub-type of Event, with REA Event sitting at the top of the hierarchy of those events which are one or other side of a transaction.

Note that the terminology used in derivatives trading is not so tidy, so some of our 1st order things will commonly be labeled Legs, and some of our 2nd order things will commonly be labeled Legs also. As long as the words are not a distraction from the meanings, that should be OK.

Then, every aspect of a transaction side which is described in terms of its function from the point of view of one party to that transaction, is a 2nd order thing, and is a kind of “Aspect” of that transaction. And every aspect of a transaction, like every aspect of anything, has a relationship to the perspective from which it is seen. For transactions, that perspective is that of the party in question.

It remains to figure out whether “Perspective” itself should be instantiated. That is, do we have Perspective in the middle of the chain between a Side and the party from whose side that is defined?

If so, then a 2nd order “Side” is a concrete thing (extending concreteness to the nature of events), being the concrete aspect of the concrete Event; while every Perspective is a 2nd order abstract thing, that from which the perspective is defined; and the perspective has a relationship to the Party or Entity from whose viewpoint the perspective is taken.

This might be overkill, but we need to think about it.

Then, every “Record”, with Ledger Account being a kind of Record, is a concrete, first order account of an Aspect of some event, from some perspective, that being the perspective of some Party (in defining transactions in the round) and specifically of some Legal Entity when describing the accounts as being those of some entity, which they necessarily must be.

Of course accounts, unlike contracts, need not pertain to Legal Entities. To incur liability is to be a Legal Entity, but accounts can be created from the point of view of any entity, for example a Trust, a Sole Trader and so on.

This is best dealt with by having a relative entity “Reporting Entity”, the range of whose “identity” property is different to the range of Contract Party, and is appropriate to the range of possible entities which may keep accounts. That is, in principle, any Autonomous Entity (or, narrowing the scope of the range specifically for reporting purposes, any Formal Organization or Sole Trader).

Given “Reporting Entity” defined in this fashion, there is no need to interpose an additional “Perspective” class of concept. A Ledger Account is maintained “from the perspective of” some recording entity, and is an account of the “side” of each event. Indeed, transaction events per REA are one type of event but everything that moves value from one ledger account to another is a kind of event, of which the REA Transaction Event is one type. And for each of these Events, what the ledger account records is that event from the perspective of that for which the account is maintained. An exception is with Vostro accounts, where both perspectives are maintained by the same organization, and both accounts are also retained (from the opposite perspective) by the correspondent organization.

Meanwhile a formal report of those accounts is from the perspective of the Reporting Entity, being presumably the same entity (except where these are grouped across several recording sub-entities for one report, e.g. by one regulated entity). This bit needs further discussion.

### The reciprocality of Rights and Commitments, and how these fit in.

We can come back to labeling later. As a starting point, and looking at the abstraction and generalization hierarchy, we needed to take care of the following sets of facts and concepts:

* Rights and their inverse (obligation / commitment / duty or whatever) exist at a level above contracts:
	+ They be conferred / mandated by law, by constitution or by contract, and perhaps by other instruments (decrees?); most generally, Instruments.
* Rights conferred by Law: the reciprocal of these is probably better labeled “Duty”
	+ This includes common-law duties (duty of care in tort) which are established by legal precedent rather than by statute
	+ The FIBO model doesn’t say much about this as it’s out of scope but we should probably try and get it right to a first approximation
* Contracts may confer, by mutual agreement, both rights and obligations on one or other party.
	+ These may be varied, or have conditions under which they are relaxed or additional rights, sanctions etc. incurred, by mutual agreement by the parties to that or a cross referenced and still-in-force contract (e.g. Master Agreement);
	+ These may be optional: it is possible to confer a right on the other party, which they are not obliged to take up
		- In fact, if they are obliged to take it up, this is no longer a right, but simply a reciprocal obligation
		- So a typical transaction is surely not the exchange of one right and one obligation, but the exchange of two obligations;
			* except in the case of an Option contract
* Not all the obligations agreed to by the parties to a Contract, are to do with Transactions, since not all contracts are transaction contracts
	+ So we have Contractual Obligation and Contractual Commitment in the model; the difference in meaning between these is unclear and not readily suggested by the labels, but the two meanings are needed: commitments made in a transaction, and other duties, commitments of obligations agreed to by one or other party to the Transaction.

From this it seems that for Transactions, we specialize the chain of rights and obligations but (with the exception of Options derivatives transactions – see later development), these become one obligation paired with another obligation. Or one commitment paired with another commitment – the words are not important.

The pair of obligations which the parties have entered into are reciprocal. For example, one is a commitment to deliver and the other is a commitment to pay.

Taking Max’s suggested wording (see email below), but applying the above idea that neither side is a “Right” as such, we could label these things such that there is a mutual “Commitment” entered into by both parties to a transaction, each side of which may be viewed as an “Obligation” to carry out their side (“Side”) of the bargain. This is developed further in a later section, where we distinguish between the striking of commitments in a deal, and the obligations incurred by doing so.

Indeed there is a necessary elapsed time between the “Bargain” whereby two parties exchange the two sides of some Commitment, and the Events (per REA) which discharge each party’s obligation, that is the events by which each side satisfies their side of the bargain.

Then, one side having discharged its obligation, this may be recorded in their financial records (ledger accounts) either then or later.

This is where the different accounting conventions come in:

* Accrual basis: movements are recorded as soon as something is a liability from one party to another
	+ That is, if I know I need to pay this amount to this party, it shows up as a liability on my books
	+ This is an Obligation
* Cashflow basis: Movements are only recorded when they correspond to actual movements of cash

(as a matter of interest, while I am no accountant, I have done books in both of these styles; accrual basis for technical contracting services, but when I inherited a dress agency from a departing girlfriend, the tax man took a dim view of me using accrual based reporting. This is not unconnected with the curious fact that dress agencies operate with what can best be referred to as “Bad credits” that is people who have brought something in but never come back to see if you have sold it for them. These are a lot like bad debts except you hold the money. I soon got out of that business.)

In accrual based accounting then, it is the Obligation which is on the books (as being, in the case of transactions, one side of a symmetrical “Commitment” between the parties to exchange those obligations).

In cashflow based accounting, the ledger records when the actual cash or goods are moved.

Most likely in between these there are some internal ledger movements reflecting expectations and presence of the assets.

# Follow-up Emails

## Side

### From Max Gilmore

Mike

before I forget, I would like to run a thought over you regarding the use of side

side,  I believe is simply a mechanism to resolve terminology

as an example

if I deliver an commodity I might use the term ship

if I deliver money I will use the term pay

if then I set up a matrix  of asset and direction  then I can fill in the appropriate term buy deciding the asset and the direction

with buy and sell  the  the resolution gets slightly more complex because it relates to an exchange of assets (one is money)  therefore I buy if I take delivery of the Dealt asset and sell if I deliver the dealt asset.  by definition we deal in the asset (i.e. we specify the quantity of the asset we require and then calculate the money from the price.

With foreign exchange  we have a problem because both sides are money so we typically treat the dealt money (i.e. the fixed amount) as the asset for determining the asset  (this is a convention)

the same applies for fixed floating  interest rate swaps where convention is to treat the fixed rate as the dealt asset.

the concept extends as far as you wish and , I think this is the concept needed to reconcile the viewpoint of the accountant and the REA view of the world

I hope this makes sense  and I would be happy to discuss it further if you wish

Regards

Max

### MB response

This is a clear description of the shape of the space that REA covers and why it covers it the way it does. We need to generalize the labels of some of the terms used in REA since they apply more broadly than just in sales transactions. We particularly need to develop the language for Fx (Dealt Currency etc.)

## Commitment

### From Max

Hi Mike

I have also been thinking about the concept of commitment  as the combination of right and obligation

It seems to me that an obligation to deliver and a right to receive  are a mandatory pair.  if you define a commitment to deliver  as being something more an intention which would bestow no right on the potential beneficiary.  this would be the case in a gift where the beneficiary has no right to the donors largess but equally the donor has no obligation

In this case the prepaid credit card commitment actually represents an option in that the bank offers the customer the right to exercise (which of course implies the bank is obliged to deliver)  what is missing is any obligation on the customer to exercise that right and hence any right on the part of the bank require the customer to accept the line of Credit or to use it

In that sense I would regard the rights and obligation as opposite sides of the same penny and the penny is the commitment.

I am not sure whether this  resolves your concern about contractual commitments being redundant but it certainly reinforces my view that

a commitment is a pair (an obligation and a corresponding right)

Regards

Max

### MB Response

I think for transactions at least we should label Commitment as being a mutual commitment to exchange two Obligations, or in some cases one Obligation and one Right (for options, credit facilities and so on).

This is perhaps best labeled “Transaction Commitment”

Are there other kinds of exchange of commitment?

Also the pairs (or more?) of obligations which people may agree to exchange may go beyond Transaction – OR – we define everything which is an exchange in these terms, as a Transaction or at least apply the REA framework to every such commitment.

Here for example one has things like insurance products, including Credit Default Swaps, where the commitment made be one party is to enter into some other, contingent transaction (buy you a new car / refund you for your losses in the case of insurance; enter into a Contingent Transaction for CDS).

We need to consider whether there are exchanges of obligations, labeled as Commitments, which go beyond transaction contexts.

Then again, in the dictionary senses of these words, the difference between Commitment and Obligation are not as described here, but rather are differences in time and tense. I commit to something because it is in the future that I will do it, and having entered into some commitment to carry out some future act, I am under obligation to do so.

The future act I commit to may well be to pay you some money (with, no doubt, a mutually agreeable commitment on your part to deliver me some things, or perform some service).

The commitments are entered into when the transaction is struck (or more accurately from a labeling perspective, when a “Bargain” is struck). Commitments, then, are struck.

Obligations are not struck, they are discharged.

Obligations are discharged because bargains are struck.

There is a time component sitting between the commitments entered into when bargains are struck, and the obligations which are discharged when a transaction has been completed. This is the same time difference that makes up the distinction between accrual and cashflow. The existence of a commitment is recorded on one’s books as either an asset (someone is going to deliver this stuff / this money to me) or a liability (I am committed to delivering this stuff to that person / transfer this money to them).

So assets and liabilities are kinds of (or reflective of) Obligations.

Each Obligation clearly has a “Side” in the 2nd order sense discussed earlier. That is, the Obligation is one Event (committed to by the parties), but is described from two perspectives (deliver to or receive from).

The Event is when the obligation committed to is discharged.

Perhaps we should model this: such that, an REA Event is the event which happens, the delivery or the transfer of money to your account; and the legal Obligation (per FIBO Legal section), is the beginning of the process.

Then different accounting bases can be described in terms of which they link to, the Obligation (from that party’s perspective), or the Event (discharging of an obligation), (again, from that party’s perspective).

Then the REA reciprocal pairs of events are a special case of the kinds of events which discharge obligations more generally, and the obligations exchanged in a transaction contract can be seen as a special case of the obligations exchanged in contracts more generally, which in turn are a special case of any obligation (as, then, is legal duty).

Then I think we have it.

# Further Thinking

## Options

One more thing remains to be unraveled: what do we do about Options?

Options, unlike other transactions, are an exchange in which one side is not a commitment (to receive or deliver, depending on one’s perspective), but a Right.

This has been difficult to fit into the current framework. On the one hand, we have a generalization hierarchy of kinds of commitment: Transaction Commitment is a kind of Contractual Commitment which is a kind of Commitment. On the other hand we have a fundamental difference in what is exchanged, defined in terms which belong at the very top of our legal terms taxonomies: the difference between an obligation and a right. So it has been difficult to work out how to define the option terms, right at the bottom of these hierarchies, in terms of differences which exist at the very top.

I think we can unpick this in the light of the suggested distinction between the striking of a deal or bargain – the exchange of commitments, and the enactment or satisfaction of a transaction in terms of the exchange of actual things of value (goods, underlying deliverable securities and so on).

That is, an Option is a kind of Deal: a deal is an exchange of commitments or Rights. The Deal in a sales transaction is simply a Bargain. This is the point at which the Commitments (in the case of the Option, a Commitment and a Right) are exchanged. The REA terms relate to the “Events” which each discharge the obligations of the parties. In accounting terms, the point at which a deal is struck is the point at which liabilities and assets are incurred, and belong in an accrual-based ledger. The REA Events are the point at which the exchange is made (“Settlement” for securities transactions), and would be recorded in a ledger which is cashflow based.

The word “Transaction” as generally used as a label in financial industry language, sometimes refers to a Transaction in the REA sense, but at other times it actually refers to a Deal – the exchange of Commitments (and Rights, for options, rights instruments), at the start of the process.

If we ignore the distractions of these industry labels, we can define some of our derivatives transactions in terms of the Deal that they represent (analogous to the Bargain in a sales transaction), and others, or other aspects of those derivatives transactions, in terms of the exchange of cashflows that they represent.

More accurately, all derivatives represent an exchange of commitments (these are represented by the “Contract” in the existing FIBO models, which have Contractual Terms Sets such as Interest Leg), AND an exchange of cash or goods in the form of (REA) Events such as delivery and settlement.

# Conclusions

Putting all this together:

* An “Aspect” is a kind of relative thing, defined by the fact that the range of the “in the context of” relationship is not a third order thing, but a first order thing
	+ Aspects may be concrete (the sides of a two dimensional object; the faces of a 3-dimensional object and so on), or abstract (the sides of an REA Event)
* REA Event is a kind of Event
* Our existing term “Side” as applied to Transaction Side is NOT a relative thing as at present, but is a kind of REA Event
	+ This is an Independent Thing, being an Event
* Transaction Sides have a reciprocal nature (per REA): Each side of a transaction has a correspondence to the other “Side” of the transaction
* Each side of a transaction has two perspectives from which it is seen
	+ Delivery or receipt of goods (Delivery Side)
	+ Delivery or receipt of Consideration (e.g. money) (Settlement Side)
* A Perspective is that of some Party
	+ We need to think about whether to expose “Perspective” itself as a kind of class, or simply have the relationship fact (object property) between the “Aspect” and that which is the party from whose perspective that aspect is defined
* Ledger Accounts are a kind of Record
	+ So are Reports
	+ Ledger accounts are a record of one Aspect of some economic movement or an economic commitment
	+ The aspect is seen from the perspective of the parties whose accounts these are
	+ Nostro and Vostro accounts are records of the same movements from two, reciprocal perspectives
* The exchange of Commitments or Rights represents a Deal
	+ In sales transactions, a suitable label for the specialization of this is a Bargain
	+ In derivatives transactions, this is usually called a Deal
	+ Most “transactions” as commonly labeled in financial services (that is, most Deals) are an exchange of Commitments
	+ Option deals are an exchange of a Commitment and a Right
* The exchange of goods or services and considerations (money or kind) is framed in REA terms, and is a pair of Events
* The Events which make up the exchange, or Transaction, are the means by which the obligation(s) incurred when a Deal was struck, are discharged
* When commitments are made, obligations are incurred and rights conferred.
	+ This is not a “kind of” or “is a” relationship but a temporal one
	+ The relationship is “incurs”: a commitment incurs an obligation
* Obligations form a taxonomy at the top of which is “Deontos”: the concept of which all deontic logic is made.
* Liabilities and assets are aspects of an obligation; or a liability is a kind of obligation and an asset is a kind of right, these being perspectives on the obligation as seen in the round
	+ There are not enough words to go around at this point; this part needs some work on the labeling of these concepts and their perspective-related aspects
* Obligations exist other than as a result of an exchange of commitments (and sometimes rights) in a Contract
* Ledger accounts may report on
	+ the exchange of commitments (incurring the liabilities and assets which then go on those books), or
	+ the exchange of cash or goods (cashflow ledgers)