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MODELLING LEGISLATION AS A GRAPH IN THE OTF PROSE OBJECT MODEL AND BLOCKCHAINS

The intersection of Contract, Legislation and Ontologies

ENDORSE.

THE EUROPEAN DATA CONFERENCE ON REFERENCE DATA AND SEMANTICS

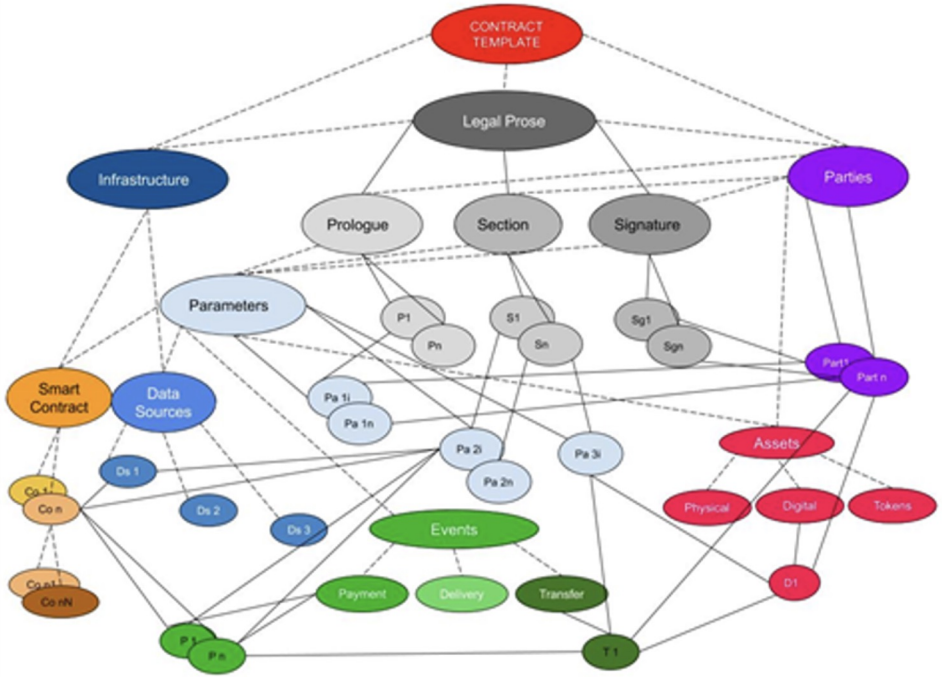
CONTRACTS:

Tomorrow, you'll hear from Sally Guyer and Luigi Telesca about the **Open Trust Fabric** and the EU's "**Modelling the EU Economy as an Ecosystem of Contracts**"

I will introduce **Prose Objects**
IAMAL – (merely a lawyer)

We start from the observation that "contracts" can be expressed as **nodes** of deal specifics that **reference** nodes for the parties, form of document and other relevant entities

If we write this way, then the contract information *remains* structured as a graph

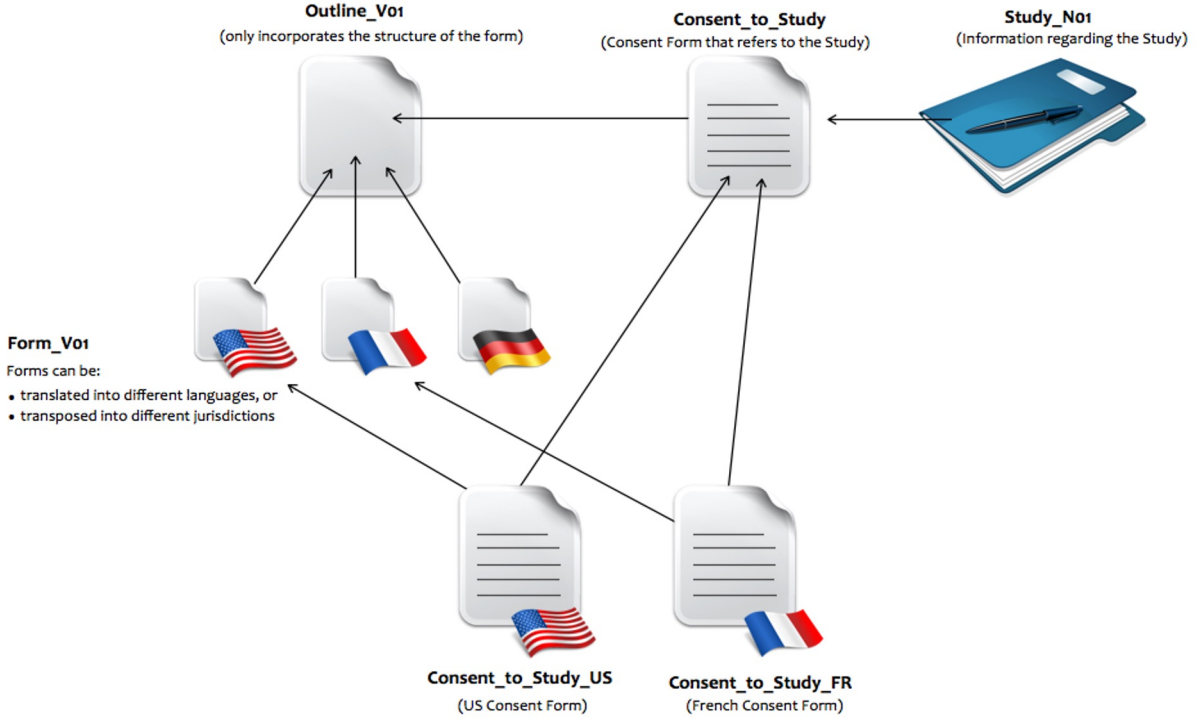


RELATIONSHIPS:

Relationships can be expressed as objects

Patient Consent

Global Alliance for Genomics and Health (GA4GH) model form



PROSE OBJECTS:

The “Prose Object” data format is a very simple semantic web model for documents

Prose Objects are unitary and composable with other functions and objects

They are composable and **malleable** via inclusion and **overriding**

They are compatible with smart contracts, blockchains, and ontologies

Contract Hash Tree

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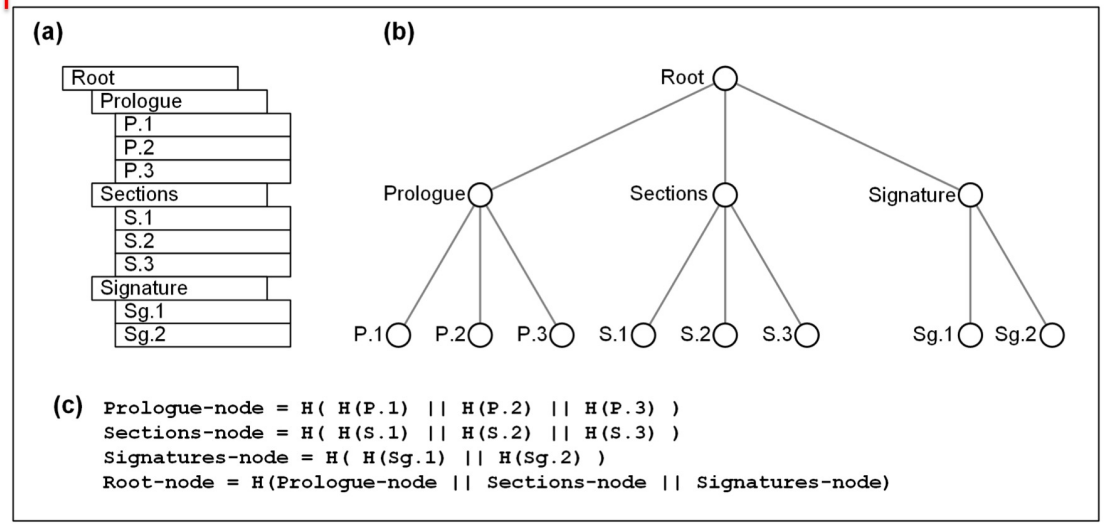

- Contract expressed as a tree of parts
- Compute hash-points from leaf upwards
- Start contract negotiation using root-document and root-hash
- Contract modification causes new hash-points to be computed

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TRANSACTION FLOWS:

Prose Objects linked together can model contract negotiation and performance flows

Each event is treated as a node

A history of a transaction expressed as a graph permits reasoning about impacts and meanings

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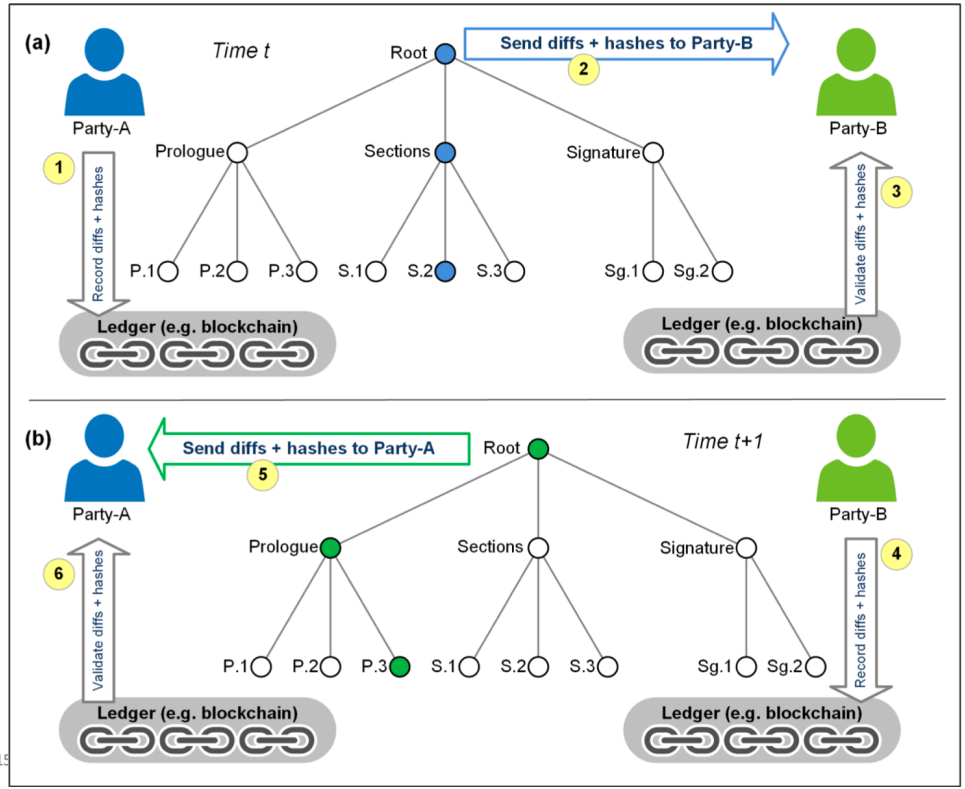
Contract Exchange Flow - Concept



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Prose Objects:

Prose Objects are:

Simple in theory

Agnostic in format - in files and emails, git, blockchains, databases, wikis, JSON, XML ...

Composable – and able reference other resources

Malleable - the end user can override or extend every element

A Named Collection of Nodes:

ThisNode:

KeyName=Value as a string with {VariableName} and <ol><li>{1.sec} </li></ol>.

1.sec=HTML Formatting

PrefixName=[OtherNode1]

=[OtherNode2]

Objectified Agreements:

/Docs/OTF/Agt-NDA-CmA/Demo/Acme-Quake/**0.md**

Document views: **Document** Xray Print Source views: Source OpenParameters See the original on GitHub

A contract document ordinarily:

- Links to the parties
- Links to some environmental factors
- Links to a form, parameterized for a use-case
- Has parameters
- Makes some choices among alternatives

//	This presents a completed NDA. It lists the parties, a place for choice of law and dispute resolution, a form and then the business points. The parties and the place are "objects" that stand for the parties and places, which makes the agreement partially "computable", as well as easy to write. The form is a One-Way, built on a common library for all NDAs. Follow the form link to see the One-Way, the general library and its components. The components include libraries for each section. It links to a general frame for "all" agreements, universally.
P1.	[OTF/U/Who/acme_incorporated.md]
P2.	[OTF/U/Who/quake_incorporated.md]
Law.	[OTF/U/Place/US/CA/San_Mateo/Geo]
	[OTF/Agt-NDA-CmA/Form/Mutual/0.md]
_P1	*Acme*
_P2	*Quake*
Doc.GUID	012346
Purpose.cl	discuss a possible collaboration between {_P1} and {_P2} in food delivery
EffectiveDate.YMD	2016-07-09
Relate.Conf.Life.End.YMD	2018-12-31
Relate.Conf.Engage.Access.sec	{Entity;Employees;NeedToKnow;Sign.sec}

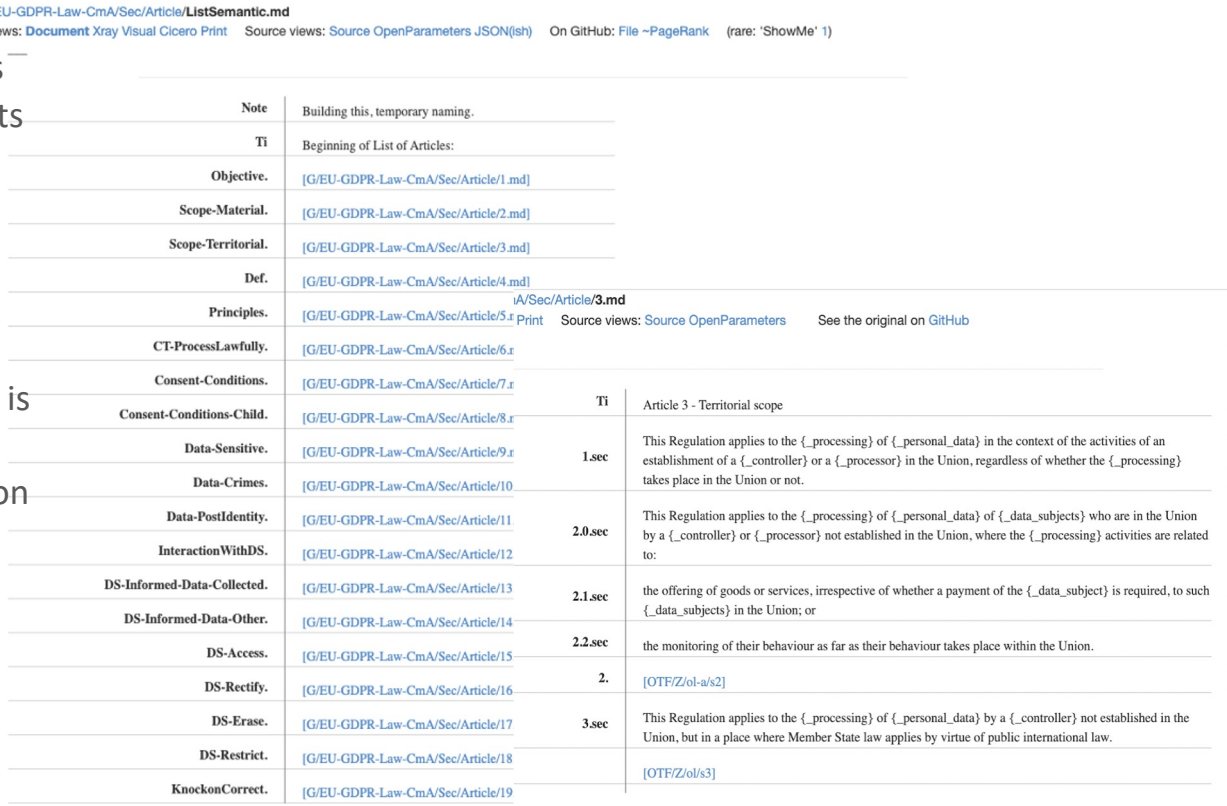
PRIMARY LAW as PROSE OBJECTS - the GDPR:

Legislation and other collective terms can also be expressed as Prose Objects

A contract may include legislative language for convenience or because the law requires it

When reading a contract provision, it is often useful to follow links to the legislation that motivates the provision

This also helps machine learning



STANDARDS and DISPUTES – ICC ARBITRATION:

Similarly, a contract may give rise to a dispute that needs to be resolved by litigation

If the contract is expressed as Prose Objects, drawing from open models, the adjudicator may be able to cut to the substance of the dispute more quickly.

The rules themselves can also be expressed as Prose Objects

/Docs/G/ICCWBO-Arbitration-CmA/Sec/**0.md**
Document views: **Document** Xray Visual Cicero Print Source views: Source OpenParameters JSON(ish) On GitHub: File ~PageRank (rare: 'ShowMe' 1)

Table Name	English	Francais	Espanol	Deutsch
ARB.1	All disputes arising out of or in connection with the present contract shall be finally settled under the Rules of Arbitration of the International Chamber of Commerce by **Choose: one arbitrator appointed OR one or more arbitrators appointed OR three arbitrators appointed** in accordance with the said Rules.	Tous différends découlant du présent contrat ou en relation avec celui-ci seront tranchés définitivement suivant le Règlement d'arbitrage de la Chambre de commerce internationale par **Choisissez: un arbitre nommé OR un ou plusieurs arbitres nommés** conformément à ce Règlement.	Todas las desavenencias que deriven del presente contrato o que guarden relación con éste serán resueltas definitivamente de acuerdo con el Reglamento de Arbitraje de la Cámara de Comercio Internacional por **{Spanish for Choose}: uno árbitro nombrado OR uno o más árbitros nombrados** conforme a este Reglamento.	Alle Streitigkeiten, die sich aus oder in Zusammenhang mit dem vorliegenden Vertrag ergeben, werden nach der Schiedsgerichtsordnung der Internationalen Handelskammer (ICC) von **Wahlen: ein gemäß dieser Ordnung ernannte Schiedsrichter OR einem oder mehreren gemäß dieser Ordnung ernannten Schiedsrichtern** endgültig entschieden.
ARB.2	All disputes arising out of or in connection with the present contract shall be finally settled under the Rules of Arbitration of the International Chamber of Commerce by **Choose: one arbitrator appointed OR one or more arbitrators appointed OR three arbitrators appointed** in accordance with the said Rules. The Emergency Arbitrator Provisions shall not apply.	Tous différends découlant du présent contrat ou en relation avec celui-ci seront tranchés définitivement suivant le Règlement d'arbitrage de la Chambre de commerce internationale par **Choisissez: un arbitre nommé OR un ou plusieurs arbitres nommés** conformément à ce Règlement. Les Dispositions relatives à l'arbitre d'urgence ne s'appliquent pas.	Todas las desavenencias que deriven del presente contrato o que guarden relación con éste serán resueltas definitivamente de acuerdo con el Reglamento de Arbitraje de la Cámara de Comercio Internacional por **{Spanish for Choose}: uno árbitro nombrado OR uno o más árbitros nombrados** conforme a este Reglamento. Las Disposiciones sobre el Árbitro de Emergencia no serán aplicables.	Alle Streitigkeiten, die sich aus oder in Zusammenhang mit dem vorliegenden Vertrag ergeben, werden nach der Schiedsgerichtsordnung der Internationalen Handelskammer (ICC) von **Wahlen: ein gemäß dieser Ordnung ernannte Schiedsrichter OR einem oder mehreren gemäß dieser Ordnung ernannten Schiedsrichtern** endgültig entschieden. Die Bestimmungen zum Eilschiedsrichterverfahren finden keine Anwendung.
ADR.1	In the event of any dispute arising out of or in connection with the present contract the parties agree to submit the matter to settlement proceedings under the ICC ADR Rules. If the dispute has not been settled pursuant to the said Rules within **45** days following the filing of a Request for ADR or within such other period as the parties may agree in writing, such dispute shall be finally settled under the Rules of Arbitration of the International Chamber of Commerce by **Choose: one arbitrator appointed OR one or more arbitrators appointed OR three arbitrators appointed** in accordance with the said Rules.	En cas de différend résultant du présent contrat ou s'y rapportant, les parties conviennent de soumettre ce différend à la procédure de règlement des différends prévue par le Règlement ADR de la CCI. Si le différend n'a pas été réglé dans le cadre dudit Règlement dans un délai de **45** jours suivant le dépôt de la demande d'ADR ou dans tout autre délai dont les parties peuvent convenir par écrit, le différend sera tranché définitivement suivant le Règlement d'arbitrage de la Chambre de commerce internationale par **Choisissez: un arbitre nommé OR un ou plusieurs arbitres nommés** conformément à celui-ci.	En caso de desavenencias derivadas del presente contrato o relacionadas con él, las partes se comprometen a someterlas al proceso de solución de desavenencias del Reglamento ADR de la CCI. A falta de resolución de las desavenencias según dicho Reglamento dentro de los **45** días siguientes a la presentación de la demanda de ADR, o al vencimiento de otro plazo que hubiera sido acordado por escrito por las partes, dichas desavenencias serán definitivamente resueltas de acuerdo con el Reglamento de Arbitraje de la Cámara de Comercio Internacional por **{Spanish for Choose}: uno árbitro nombrado OR uno o más árbitros nombrados** conforme a dicho Reglamento de Arbitraje.	Die Parteien vereinbaren, im Falle aller Streitigkeiten, die sich aus oder in Zusammenhang mit dem vorliegenden Vertrag ergeben, ein Streitbeilegungsverfahren nach den ICC-ADR-Regeln durchzuführen. Wird die Streitigkeiten nicht innerhalb einer Frist von **45** Tagen ab dem Tag des Einreichens des Antrags auf Durchführung eines ICC-ADR-Verfahrens oder innerhalb einer anderen, von den Parteien schriftlich vereinbarten Frist im Einklang mit den ICC-ADR-Regeln beigelegt, wird die Streitigkeit nach der Schiedsgerichtsordnung der Internationalen Handelskammer (ICC) von **Wahlen: ein gemäß dieser Ordnung ernannte Schiedsrichter OR einem oder mehreren gemäß dieser Ordnung ernannten Schiedsrichtern** endgültig entschieden.

PROSE OBJECTS and ONTOLOGIES:

Contracts are a great vehicle for incremental codification, standardisation and convergence on ontologies

Some powerful ontologies are ready for use

This is an example of an ontology - ACTUS - expressed as Prose Objects

Please tell us about others!

/Docs/OTF/ACTUS/Taxonomy/Financial/**0.md**
Document views: **Document** Xray Print Source views: Source OpenParameters See the original on GitHub

Financial Contract

1. Basic
    1. Fixed Income
        1. Maturities
            1. PAM
                1. **Name:** Principal at Maturity
                2. **Summary:** Principal payment fully at Initial Exchange Date (IED) and repaid at Maturity
                3. **Real World:** All kind of bonds, term deposits, bullet loans and mortgages etc.
                4. **Status:** Implemented, tested
            2. ANN
                1. **Name:** Annuity
                2. **Summary:** Principal payment fully at IED and interest plus principalrepaid periodically i to be fully matured at MD.
                3. **Real World:** Classical level payment mortgages, leasing contracts etc.
                4. **Status:** Implemented, tested
            3. NAM
                1. **Name:** Negative Amortizer
                2. **Summary:** Similar as ANN. However when resetting rate, total amount (interest plus prir
                3. **Real World:** Special class of ARM´s (adjustable rate mortgages), Certain loans.
                4. **Status:** Implemented, tested
            4. LAM
                1. **Name:** Linear Amortizer
                2. **Summary:** Principal payment fully at IED. Principal repaid periodically in constant amou recalculated. Fixed and variable rates.
                3. **Real World:** Many amortizing loans.
                4. **Status:** Implemented, tested
            5. ANX
                1. **Name:** Exotic Annuity

NEXT STEPS:

Prose Objects are in their infancy.
- a well-developed theory,
- a multitude of examples,
- support from the OpenTrustFabric.org, the WorldCC and the EU Commission's "Modelling the EU Economy as an Ecosystem of Contracts."

aNewGovernance.org is also adopting Prose Objects.

Our ontology is provisional and primitive. The model needs further development along the lines of semantic web.

We welcome connections:

Please see OpenTrustFabric.org to learn more and subscribe, or contact any of us.

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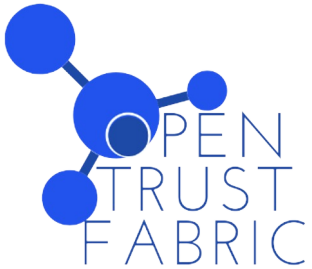

Modelling legislation as a Graph when using the OTF Prose Object Model, Blockchain and more

James Hazard