Accord Project - Open Data Standards
<u>Smart Legal Contracts: State of Play</u>

1. **Working Group Scope and Issues**
   a. standardizing data identifiers and data formats
   b. encryption standards
   c. verifying data integrity
   d. technical standards for data transmission
   e. data structure and standard interoperability
   f. data ownership (e.g., IoT)
   g. authoritative sources and minimum standards (e.g., ISO standard 17442)
   h. universal unique identifiers, object spaces, and namespaces
   i. data protection, privacy, and permanence/transience
   j. data obfuscation technologies and standards (e.g., SGX, Zero-Knowledge Proofs)
   k. interaction with legal regulation - GDPR, etc
   l. Legal Entity Identifiers
   m. dealing with disputes over data integrity and accuracy.

2. **Modeling and Markup Languages and Data Standards**
   a. **General**
      i. SGML
      ii. XML (see also Linked Data)
      iii. Open Data Charter principles

   b. **Business**
      i. EDI
      ii. SDXF (Structured Data eXchange Format)
         1. data serialization format defined by RFC 3072
      iii. XBRL - the open international standard for digital business reporting
      iv. Open Document Format
         1. OpenDocument Format (or ODF for short) is the worlds leading document standard as maintained by the Organization for the Advancement of Structured Information Standards (OASIS), and was first adopted as an international standard in 2005 by ISO/IEC JTC1 SC34.
      v. Hyperledger Composer modelling language (CML)

vi. GS1 - globalsupply chain standards for identification and structured data
1. Press Release, "Blockchain: GS1, IBM and Microsoft collaborate to leverage standards"
vii. ACORD insurance industry data standards

c. **Finance**
   i. Financial Industry Business Ontology (FIBO)
   ii. FpML (Financial products Markup Language) - an XML message standard for the OTC Derivatives industry (Wikipedia)
   iii. ISDA Common Domain Model (CDM) - a standardized, digitised representation of derivatives trade lifecycle events and actions. Such a common representation will help realize the full potential of emerging technologies, such as distributed ledger and smart contracts
   iv. MLFi: the Modeling Language for Finance
   v. ACTUS - goal of ACTUS is to break down the diversity in financial instruments into a manageable number of cash flow patterns – so called Contract Types (CT). Thereby, ACTUS defines two standards: ACTUS Data Standard. ACTUS Algorithmic Standard.
   vi. **Financial taxonomies**
      1. Legal Entity Identifiers (LEIs) - a 20-digit, alpha-numeric code that connects to key reference information that enables clear and unique identification of legal entities participating in financial transactions
         a. Bloomberg LEI
      2. UPI and Taxonomy
      3. UTI/USI
      4. Harmonisation of the Unique Product Identifier (UPI) - guidance issued by CPMI-IOSCO
      5. Harmonisation of critical OTC derivatives data elements (other than UTI and UPI) - third batch, consultative report, June 2017 (Bank for INternational Settlements)
   vii. SWIFT Data Standards
   viii. List of financial other domain specific languages

d. **Contracting and Smart Contracting**
   i. IACCM standards

      ii.   Accord Protocol (proposal; [template specification](#))
      iii.   [Stanford Contract Description Language](#) (CDL)
      iv.   [LegalXML](#)
      v.   [Open Contracting Data Standard](#)
      vi.   [Solidity Data Types](#)
      vii.   Corda [Key Concepts](#) and [Legal Prose](#)
      viii.   [Ivy smart contract docs](#)
      ix.   [Quorum](#)

3. **Open Data - Organizations and Projects**
   a. [Open Data Institute](#) - we help people identify and address how the web of data will impact their businesses and their sectors. Together, we will build a strong data infrastructure that delivers open innovation at web-scale.
   b. [Open Contracting Partnership](#): We connect governments, civil society and business to open up and monitor public contracting. Publisher of [Open Contracting Data Standard](#).
   c. [Open Ownership](#): A new project to create a Global Beneficial Ownership Register to fight corruption
   d. [Joined Up Data Standards](#)
      i. Development Initiatives works to end absolute poverty by 2030 by making data and information on poverty and resource flows transparent, accessible and useable.
      ii. Publish What You Fund is the global campaign for aid transparency. Our mission is to achieve a significant increase in the availability of comprehensive, timely, comparable and accessible information about development flows.
   e. [Open Data Charter](#): "a collaboration between governments and experts working to open up data. It was founded in 2015 around six principles for how governments should be publishing information. The aspiration was that data should be open by default.
   f. [Legal Entity Identifier Regulatory Oversight Committee](#)
   g. [Global Legal Entity Identifier Foundation (GLEIF)](#)
   h. [United Nations Centre for Trade Facilitation and Electronic Business (UN/CEFACT)](#)
   i. [The Federal Geographic Data Committee (FGDC)](#)
   j. [The National Information Exchange Model (NIEM)](#)
   k. [Open Standards principles - GOV.UK](#)

4. **Identity and Trust Frameworks**

a. **Identity and TFs: Approaches and standards**
   i. [W3C DID Spec](#)
   ii. self-sovereign identity
      1. [Self-Sovereign Identity: Whitepaper about the Concept of Self-Sovereign Identity including its Potential](#) by Andreas Abraham (2017)
      2. [uPort: Self-Sovereign Identity](#)
   iii. [OpenID](#)
   iv. [GS1 ID Keys](#)
      1. give companies efficient ways to access information about items in their supply chains (e.g., Global Location Number (GLN) for parties and locations; Global Individual Asset Identifier (GIAI))
   v. [Corda Identity](#)
   vi. [Civic Identity Verification](#)
   vii. governmental approaches
      1. Virginia Electronic Identity Management Act
      2. EU eIDAS Regulation

b. **Identity: Organizations and initiatives**
   i. [Open Identity Exchange](#)
   ii. [Sovrin Foundation](#)
   iii. [Mooti](#) - Mooti is the new standard for cryptographic identification and validation. based on our identity chain technology, we are reimagining the security of personally identifiable information and authentication.
   iv. [Everynym](#) - Our technology enables any person, organization, or connected thing to strongly and instantly authenticate any other person, organization or thing, without a platform in the middle and without contacting third parties
   v. [Hyperledger Indy](#)
      a. Sovrin is a specific deployment of the Hyperledger Indy codebase

c. **Trust frameworks**
   i. [US ICAM LOA 1](#)
      1. [DG - Blockchain and Smart Contracts](#)
   ii. Line Information Database
   iii. [Sovrin Trust Framework](#)

        iv.   [Trust Framework for Health Information Exchange](#)

        v.   [Online Trust Alliance IoT Trust Framework](#)

        vi.   The Open Identity Trust Framework (OITF) Model

    d. **Verifiable Claims**

        i.   [W3 Verifiable Claims Working Group Charter](#)

        ii.   [Verifiable Claims Deep Dive - IIW](#)

5. **Selected Resources and Publications**
   a. "[The Success of Open Data Depends on Open Standards](#)"
   b. [The Open Data Handbook](#)
   c. [What Is an Identity Trust Framework? - American Bar Association](#)
   d. [Interoperability In the New Digital Identity Infrastructure](#) by Rundle