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ETSI DGS ISG-PDL 029 V0.0.3 (2024-04)

**Group Specification**

Digital Autonomous Organization (DAO);

Permissioned Distributed Ledger;

Group Specification PDL029

Release 1

<

Reference

GS/PDL-0029\_Digital\_Autonomous\_Organization

Keywords

Data Interoperability, Data Models, PDL

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Contents

Intellectual Property Rights 5

Foreword 5

Modal verbs terminology 5

Executive summary 5

Introduction 5

1 Scope 6

2 References 6

2.1 Normative references 6

2.2 Informative references 6

3 Definition of terms, symbols and abbreviations 6

3.1 Terms 6

3.2 Symbols 6

3.3 Abbreviations 6

4 Definition of a DAO 7

4.1 Foreword 7

4.2 Current definition 7

4.3 Current Implementations 7

4.4 Differences between a DAO and traditional organizations 8

5 Minimum requirements to operate a DAO 9

5.1 Foreword 9

5.2 Minimum Requirements 9

5.2.1 Implementation Agreements 9

5.2.2 Governing Entity 9

5.2.3 Smart Contracts 9

5.2.4 Data Models 9

5.2.5 Processes 9

5.2.6 Chains 9

5.2.7 Code Base 10

5.2.1.1 Introduction to code base 10

5.2.1.1 Open Source 10

5.2.1.2 Proprietary code 10

5.2.2 Chain type 10

5.2.3 Validating nodes 10

5.2.4 Neutral nodes 10

6 Operating a DAO 11

6.1 Foreword 11

6.2 Single Chain environment 11

6.2.1 Single Chain considerations 11

6.2.1.1 Codebase 11

6.2.1.2 Nodes 11

6.2.1.3 Governance 11

6.3 Hybrid environment 11

6.3.1 Types of Hybrid environments 11

6.3.1.1 Multi Chain 11

6.3.1.2 Multi Vendor/Code base 11

6.3.2 Multi-chain 11

6.3.2.1 Interoperability 11

6.3.2.1.1 Data Interoperability 11

6.3.2.2.1 Consensus interoperability 11

6.3.2.3.1 Smart-Contract interoperability 11

6.3.3 Multi Vendor/Codebase 11

6.3.3.1 Data Model alignment 11

6.3.3.2 Architectural alignment 11

6.3.3.2.1 Interface Reference Points 11

6.3.3.2.2 Functional blocks 11

6.3.3.3 Process alignment 11

6.4 Tokens 11

7 Governance 12

7.1 Definition of governance 12

7.1.1 Functionality 12

7.1.2 Architectural elements 12

7.1.2.1 Implementation agreements 12

7.1.2.2 Governing Entity 12

7.2 Governance in a Single chain environment 12

7.3 Governance in a Hybrid environment 12

7.4 Governance through consensus 12

7.4.1 on-chain consensus 12

7.4.2 off-chain consensus 12

7.4.3 multi-chain consensus 12

7.4.3.1 Voting and majority in a multi chain environment 12

7.5 Governance without consensus 12

7.5.1 Delegated governance 12

7.5.1.1 Human delegates 12

7.5.1.2 Machines as delegates 12

7.6 Automated governance 12

7.6.1 Minimum requirements 12

7.6.1.1 Unified data models 12

7.6.1.2 Unified processes 12

7.6.1.3 Unified IRPs 12

7.6.2 Code-base alignment 12

7.7 Hybrid governance 12

7.7.1 Evolution of hybrid governance 12

7.7.2 Initiation 12

7.7.3 Scale 12

7.7.4 Self sustained 12

7.7.5 Change management 13

7.8 Tokens in a Hybrid environment 13

Annex A (normative or informative): Title of annex 14

Annex B (normative or informative): Title of annex 15

B.1 First clause of the annex 15

B.1.1 First subdivided clause of the annex 15

Annex (informative): Bibliography 16

Annex (informative): Change history 17

History 18

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# Foreword

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# Executive summary

# Introduction

# 1 Scope

The present document …

# 2 References

## 2.1 Normative references

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The following referenced documents are not necessary for the application of the present document but they assist the user with regard to a particular subject area.

[i.1] <Standard Organization acronym> <document number><version number/date of publication>: "<Title>".

[i.2] etc.

# 3 Definition of terms, symbols and abbreviations

## 3.1 Terms

For the purposes of the present document, the [following] terms [given in ... and the following] apply:

## 3.2 Symbols

For the purposes of the present document, the [following] symbols [given in ... and the following] apply:

## 3.3 Abbreviations

For the purposes of the present document, the [following] abbreviations [given in ... and the following] apply:

# 4 Definition of a DAO

## 4.1 Foreword

The acronym DAO stands for Decentralized Autonomous Organization:

**Decentralized** – in a manner that it is managed through decentralized governance using tools that allow it to function without a centralized authority. Blockchain, DLT and PDL (which by themselves are common derivatives of blockchain) are often used as the tool enabling such decentralized governance.

**Autonomous** – in a manner that a DAO operates by itself and independent of involvement of external entities or powers. That does not mean that a DAO is disconnected from its surroundings and does not require certain resources from external sources (e.g., power supply, communication facilities) but it is able to perform its tasks in an autonomous manner without being influenced by external events or forces.

**Organization** – in a manner that corroborates to achieve goals defined by a multitude of entities (individuals, groups, companies or institutional bodies).

There are additional aspects to a DAO:

1. It is **collectively owned** by multiple entities. Some DAOs are owned by an equal split of ownership. Others allow differential split based on criteria such as amount of investment, amount of use, amount of assets/tokens etc.
2. It operates towards a **shared mission** defined collectively by the shared owners.

Operation using Blockchain allows:

1. **Automated functionality** using smart contracts.
2. Data is **immutable** (or resistant to change) and **non-repudiable**.
3. **Trust** between otherwise non-trusting entities.

It is often claimed that Bitcoin [i.x] was the first DAO, because it arguably meets the above criteria. While this may indeed be the case, there are additional uses for a DAO other than cryptocurrency and the current view of a DAO has taken a slightly different shape as described in section 4.2 herewith.

## 4.2 Current definition

The abstract definition of a DAO is a system that enables distributed decision making, management and ownership of assets.

The current implementations of DAOs are based on an operational model characterized by:

1. **A single ledger technology.** Any type of ledger can be used (distributed or not) as long as it supports smart contracts (code executed automatically when certain conditions are met). There are no implementations utilizing two or more ledger technologies.
2. **Non-proprietary codebase.** The code may be open sourced (open and available to the public through a git) or partially open (open and available only to members in a consortium operating the DAO). One way or the other – there should not be elements of the codebase that are proprietary (meaning: can be executed by everyone but visible only to certain entities).

NOTE: There are DAOs that are based on proprietary code.

## 4.3 Current Implementations

DAOs are currently used for a multitude of purposes. A non-exhaustive list can be found below. While it is beyond the scope of the current document to discuss each implementation, the following list provides a glimpse to the variety of use-cases where a DAO can be used to offer a democratised solution to a service that would otherwise be operated and governed centrally.

* Legal services (LexDAO)
* Venture capital (“The DAO”, BitDAO)
* Crowdfunding (UkraineDAO, ConstitutionDAO, MakerDAO)
* Shared interests and collaboration (Decentraland, “Friends with Benefits”, Aragon, PleasrDAO)
* CryptoCurrency trade (Uniswap, “Curve DAO”, DASH)
* Investment (Aave, Compound, HeadDAO, GnosisDAO)
* Governance (Aragon)
* Entertainment and Media (Flufworld)
* Social Networking (Blockster)
* DAO as a service (DAOstack, Aragon)

## 4.4 Differences between a DAO and traditional organizations

While traditional organizations operate in more than one manner table [x] herewith describes the main differences between a DAO and a traditional organization:

Table 1

|  |  |  |
| --- | --- | --- |
| Title | DAO | Traditional Organization |
| Hierarchy and structure | Flat, controlled through democratic vote of all participants | Centralized hierarchy controlled by select entities. |
| Speed of decision | Fast. Flat hierarchy: everyone can decide (by vote) in parallel | Slow, Sequential approvals following hierarchy. |
| Voting | Any change has to be agreed through a democratic vote | A single or a subset of all entities may make decisions and changes without need for consent by entities affected by such change |
| Governance | The entire community governs the behaviour of the DAO | Select entities govern the behaviour of the organization |
| Transparency | All actions and decisions are transparent and visible to all participants (in public DAOs: visible to everyone). | Restricted visibility and transparency. Decisions may be kept confidential. |
| Operation and handling of events | Automated using smart contracts | Often requires manual processes |

# 5 Minimum requirements to operate a DAO

## 5.1 Foreword

A DAO is structured of certain mandatory components which, as a minimum, include the following:

1. **Implementation Agreements** that are accepted and adhered to by all participants of the DAO.
2. **A Governing Entity** that performs the governance tasks.
3. **Smart contracts** that control the behavior of the DAO by implementing and enforcing the Implementation Agreements.
4. **Data Models** that are used to define the objects managed through the DAO.
5. **Processes** defining the actions and transitions of such objects through their life cycle.
6. One or more **chains** capable of executing smart contracts.
7. One or more **code-bases** that are used to configure the smart contracts.
8. **Nodes** that store the data, validate the data and take part in consensus and governance activities.

The Objects referred to in this clause can be physical items/goods, virtual goods, tokens, cryptographic currencies, services, products and any combinations thereof.

## 5.2 Minimum Requirements

### 5.2.1 Implementation Agreements

Implementation Agreements are collectiosn of rules and agreements that define how the DAO is implemented. They are defined in section 4.6.3.6.1(a) of PDL-12 [i.x].

### 5.2.2 Governing Entity

The Governing Entity performs governance tasks by defining the rules and Implementation Agreements, as well as ensuring compliance and resolving conflicts where needed. It is defined in section 4.6.3.6.1(b) of PDL-12 [i.x].

### 5.2.3 Smart Contracts

Smart Contracts are executable code embedded into the chain that operates on certain conditions. They are defined in PDL-4 [i.x].

### 5.2.4 Data Models

Data Models organize elements of data and standardizes how they relate to one another and to properties of real-world objects. They are defined in section 4.6.3.14.3 of PDL-12 [i.x].

### 5.2.5 Processes

Processes are a series of actions or events performed for the purpose of a chieving a certain result. In a multi-entity environment, there may be *internal processes* that occur within an entity and *externally-facing processes* where the progress of a process relies on input from other processes or requires output to other processes.  
  
While internal processes do not require adherence to standard data models and sequence of events, externally-facing processes require alignment of data-models and sequence with other externally facing processes to ensure that data exchanged between such processes is meaningful and can be correctly consumed by the other process.

### 5.2.6 Chains

Chains are at the heart of the blockchain paradigm. They are blocks of data linked to each other in a manner that creates dependency of each link in the chain on all previous links. Such dependency allows a quick and easy way to identify attempts to modify the data in previous links thus making the data in the links of such chain immutable to change (tamper-proof). While it is argued that the term “immutable to change” or “tamper-proof” may not be absolutely accurate and some definitions prefer the term “tamper-resistant”, the overall approach considers the data in the chain as more secure and more reliable than traditional data repositories managed centrally.

### 5.2.7 Code Base

#### 5.2.1.1 Introduction to code base

A codebase is an inclusive term that describes the code used to develop the smart contracts in chains as well as the applications that use such chain and the user (GUI) and machine interfaces (e.g., APIs) through which different objects and entities interact. A code base would typically use one or more computer programming languages.

#### 5.2.1.1 Open Source

Open source code base is code that is available for select groups of users to view, copy and use. Such select groups may be “everyone” (in which case the code has to be stored in a repository allowing unrestricted access to anyone). In certain cases the code is only open to select groups that meet certain criteria, such as participants of a certain project or DAO (in which case access to the code is controlled and only allowed to users that meet such criteria).  
Most open-source code based projects allow users to contribute their own code. The code is typically managed through a git that is used to control the distribution and versioning of such code.  
Open Source code may be subject to licensing which may pose certain restrictions on distribution, use and modification of such code. Such licenses are typically not associated with a cost but the use of licensed open source code indicates acceptance of the rules and procedures defined in such license.  
In the event such code as IPR the owners of such IPR would not charge for its use, thus the code can be used for free.

#### 5.2.1.2 Proprietary code

Proprietary code is developed by a developer or group of developers that maintain IPR of such code and do not expose it to the users. In such case all development is done by the owners of the IPR and no other contributions are allowed. It is the prerogative of the owner of the IPR to charge money for the development and use of such code.

### 5.2.2 Chain type

### 5.2.3 Validating nodes

### 5.2.4 Neutral nodes

# 6 Operating a DAO

## 6.1 Foreword

## 6.2 Single Chain environment

### 6.2.1 Single Chain considerations

#### 6.2.1.1 Codebase

#### 6.2.1.2 Nodes

#### 6.2.1.3 Governance

## 6.3 Hybrid environment

### 6.3.1 Types of Hybrid environments

#### 6.3.1.1 Multi Chain

#### 6.3.1.2 Multi Vendor/Code base

### 6.3.2 Multi-chain

#### 6.3.2.1 Interoperability

##### 6.3.2.1.1 Data Interoperability

##### 6.3.2.2.1 Consensus interoperability

##### 6.3.2.3.1 Smart-Contract interoperability

### 6.3.3 Multi Vendor/Codebase

#### 6.3.3.1 Data Model alignment

#### 6.3.3.2 Architectural alignment

##### 6.3.3.2.1 Interface Reference Points

##### 6.3.3.2.2 Functional blocks

#### 6.3.3.3 Process alignment

## 6.4 Tokens

# 7 Governance

## 7.1 Definition of governance

### 7.1.1 Functionality

### 7.1.2 Architectural elements

#### 7.1.2.1 Implementation agreements

#### 7.1.2.2 Governing Entity

## 7.2 Governance in a Single chain environment

## 7.3 Governance in a Hybrid environment

## 7.4 Governance through consensus

### 7.4.1 on-chain consensus

### 7.4.2 off-chain consensus

### 7.4.3 multi-chain consensus

#### 7.4.3.1 Voting and majority in a multi chain environment

## 7.5 Governance without consensus

### 7.5.1 Delegated governance

#### 7.5.1.1 Human delegates

#### 7.5.1.2 Machines as delegates

## 7.6 Automated governance

### 7.6.1 Minimum requirements

#### 7.6.1.1 Unified data models

#### 7.6.1.2 Unified processes

#### 7.6.1.3 Unified IRPs

### 7.6.2 Code-base alignment

## 7.7 Hybrid governance

### 7.7.1 Evolution of hybrid governance

### 7.7.2 Initiation

### 7.7.3 Scale

### 7.7.4 Self sustained

### 7.7.5 Change management

## 7.8 Tokens in a Hybrid environment

Annex A (normative or informative):  
Title of annex

Annex B (normative or informative):  
Title of annex

# B.1 First clause of the annex

## B.1.1 First subdivided clause of the annex

Annex (informative):  
Bibliography

Annex (informative):  
Change history

| Date | Version | Information about changes |
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| <Month year> | <#> | <Changes made are listed in this cell> |
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# History

|  |  |  |
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| **Document history** | | |
| <Version> | <Date> | <Milestone> |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |

*Latest changes made on 2022-03-14*