Token

Transformative impact of disruptive technologies
in public services

www.token-project.eu

D6.1: Plan for the Exploitation and Dissemination of Results

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1 Introduction

Executive Summary

The H2020 project 'TOKEN', in the scope of digital transformation of Public Administrations, aims to develop an experimental ecosystem to enable the adoption of Distributed Ledger Technologies and to prove its value via highly replicable Use Cases, as a driver for the transformation of public services. To facilitate and make effective such transformation an open and collaborative approach has been chosen.

The transformation is centered on the adoption of blockchain technologies. The created Blockchain Platform as a Service Solution (BCPaaS) includes a developer-friendly set of plug-and-play services and open-source components for building decentralized apps and services. This document prepares pathways to assure that the TOKEN BCPaaS can continue its operations and even grow further after the end of the project.

This is the first of a series of deliverables on Exploitation and Sustainability that will address a definition of what and how the innovation products of TOKEN are to be exploited, i.e. the pilot platform for Public Administration to develop use cases and pilot their solutions or a fully operational DLT as a Service platform for Public Administrations.

Hence, this deliverable contains the current value proposition of the TOKEN platform based on the dedicated workshops that were conducted guided by the Open Commons Business Model. In this context the below items are initially addressed in this document and will be updated over the course of TOKEN project as we continuously gather further inputs from the users (early adopters) and project partners partners:

- In Chapter 2, we present general information on the TOKEN platform, including information about use case readiness and implementation, impact assessment ,communication and community building;
- Chapter 3 presents an exploitation plan and vision, including approaches through which the project results will be sustained, developed, extended (services and functions) and scaled up promotion and recruitment of new users/members for example with the Early Adopters program which is developed in detail in Chapter 4. The process of developing the ground for building a credible business, cost and revenue model that can ensure the longer-term sustainability of the platform its work in progress, what has been advanced is described in this Chapter but will be addressed in a complete document by the end of October 2022 (D6.2 TOKEN Business Plan);

- The Plan for activating and engaging early adopters is shown in Chapter 4. We present the current activities happening recently and planned during (workshop and technical events) the TOKEN project, and those we foresee for after the project. Furthermore, an initial plan for attracting early adopters is elaborated;
- Chapter 5 presents the legal structure (profit or non-profit) and governance model which will: manage, maintain and exploit the platform and its technical evolution; regulate the coexistence of different operators and services; establish rules and criteria for other nodes to join the platform; ensure the compliance with existing policies and regulation at national and international level. In this regard this deliverable also shows the work done so far and a full deliverable (D6.3 Governance Model) is planned to be submitted as well by the end of October 2022.
- Finally, in Chapter 6 we present a general conclusion for this deliverable by emphasising the current progress and furthermore addressing the possible on further evaluation of activities on different TOKEN related activities, and their reflection in future deliverables.

So this document contains a jointly designed and detailed exploitation and dissemination strategy, defining the current status related to how TOKEN results will impact on the market, on future developments and/or policy making.

Intended audience

- Project and system managers considering improvement of their platform and synergies with TOKEN BCPaaS, i.e., all potential users.
- Developers and users of the Token Platform.

Acronyms

BCPaaS	**Blockchain Platform as a Service**
DoA	**Description of the Action**
PUC	**Pioneer Use Case**
WP	**Work Package**
DAPPs	**Decentralised Applications**
GRTD	**Governance Review Template Document (GRTD)**

2 General information on TOKEN

Within the TOKEN project the different streams of work divided in 7 Working Packages (WP) are contributing to this deliverable in the following way. **WP1 DLT Architecture** provides the main technological assets and resources that will be embedded in the Value Proposition defined in this document; **WP2 Use Case Readiness** brings practical lessons for refining the value proposition and for shaping onboarding services for newcomers; **WP3 Use Case Implementation** provides case studies for shaping the business and engagement models; **WP4 Impact Assessment & Policy Learning** provides inputs for refining the business model; **WP5 MarCom & Community Building** will support the provision of newcomers and adopters to be engaged in the Association that will maintain the TOKEN BCPaaS beyond the project, this WP will also provide events and dissemination actions that will transmit the main messages designed as part of the sustainability strategy. Please note that bringing newcomers can be initiated by any partner, the communication activities will certainly provide opportunities for that. In this Chapter, we present general information of the TOKEN platform as contextual information to support other Chapters in this document.

2.1 Technical Components of TOKEN Project

2.1.1 BCPaaS

Blockchain Platform as a service (BCPaaS) offers a developer-friendly set of plug-and-play services and open-source components for building decentralized apps and services described in Figure 1. The TOKEN team is conscious that it is not only the technical service which will make the platform sustainable but all the socio-economic, organizational, cultural, institutional , legal and political environment that will also

influence the success of it. Those aspects are being taken in account and are being incorporated as inputs through the different streams of the project through the Portfolio of Pioneer Case Studies, the Toolkit for Policy Makers which collects inputs and learnings on public sector blockchain from the TOKEN Observatory for Policy Makers described on section 4.2.1.2 of this document and publishes TOKEN briefing and research papers The papers have been disseminated via our website and beyond and will continue to be used as input for our Exploitation and Sustainability activities.

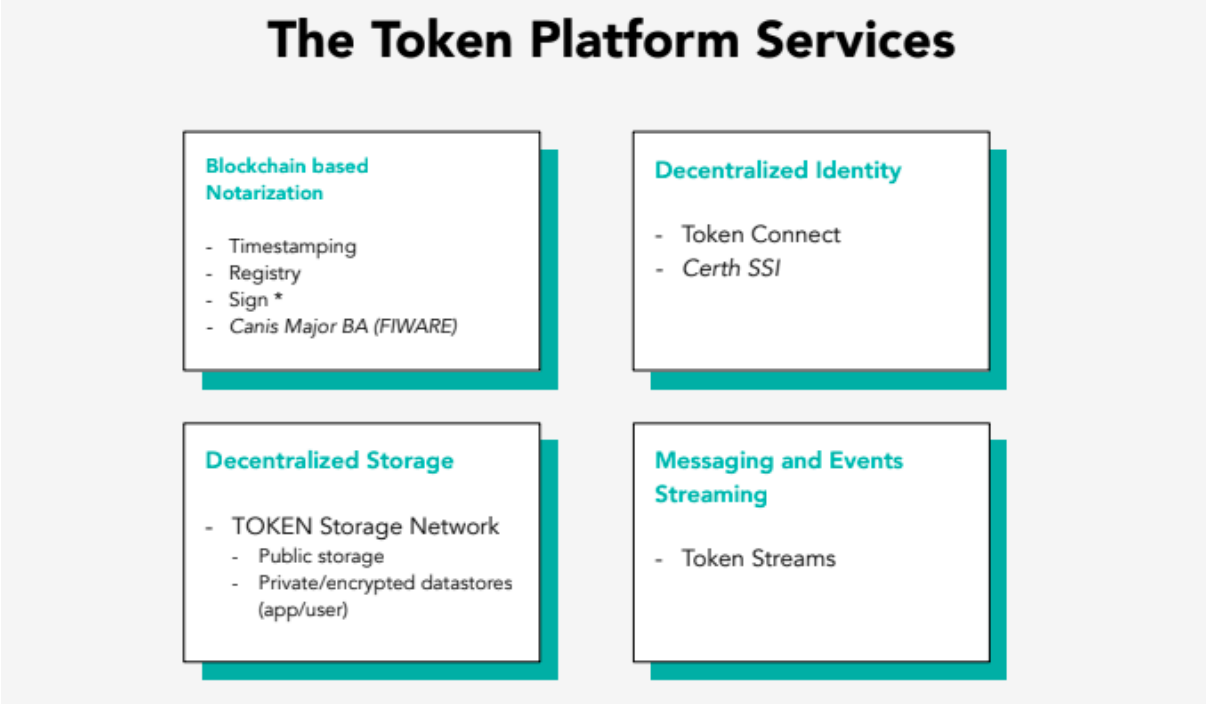

Figure 1 – The TOKEN platform services

2.1.2 DLT Architecture

WP1 is providing the main technological assets and resources that are embedded in the Value Proposition defined in this WP.

That TOKEN infrastructure comprises:

▪ An organized collection of standards, specifications and data formats/vocabularies providing capabilities such as identity, authentication, authorization, verification, messaging, etc.

▪ A set of open source software components, APIs and SDKs related Decentralized Identity and Storage.

▪ Specifications and design notes describing an API to extend existing standards and achieve the interoperability with existing DLT solutions, to guide developers building servers or applications.

▪ A Testnet (distributed network) implementing the TOKEN specification.

▪ A test suite for testing and validating TOKEN implementations.

▪ An ecosystem of applications, identity and storage providers, and helper libraries that run on the TOKEN Platform.

▪ A community providing documentation, discussion, tutorials, and presentations.

2.1.3 TOKEN Wiki

The TOKEN Wiki provides useful information that may answer upfront many of the questions that users and developers of the TOKEN BCPaaS might have. It provides the correct documentation of the hardware and software resources, as well as the methodologies for an agile adoption and transformation of Public Services (See deliverable D1.5)

The TOKEN Wiki can be accessed via this link.

2.2 Use Case Readiness

WP2 brings practical lessons for refining the Value Proposition and for shaping onboarding services for newcomers.

In the first year of the project (2020) the different PUCs conducted a series of activities. which involved

- The two-day Immersive Bootcamp activating the PUCs and stakeholders involved in the Token project. The outcome of this bootcamp resulted in a readiness roadmap, describing the guidelines for analysis of current processes. The details of this readiness roadmap can be found in the official deliverable D2.1 Readiness Roadmap
- A progress tracking tool to guide the PUCs was implemented, based on IMEC's developed software called Innovatrix. The tool can be accessed via token.innovatrix.be. A series of individual coaching sessions was held to scope the PUCs for the user story mapping workshop. The progress of the different PUC can be found in the Innovatrix too.
- User and market research activities (through interviews, observations, and state of the art analysis) by the different PUCs validating key assumptions
- A user story mapping workshop was organised with each PUC individually to gather the user requirement. The output of this workshop was processed in D2.3 User Requirement Report

- During the two-day warm-up bootcamp the PUCs reflected on the implementation phase and touched upon technical and organisational dimensions. The outcome of the bootcamp was processed in D2.4 Use case implementation plan.

2.3 Use Case Implementation

WP3 provides case studies for shaping the business and engagement models. It provides real scenarios for piloting the technology and users' feedback and requests for improvement, support, and maintenance.

The scope is to execute four Pioneer Use Cases (PUCs) that will pilot the use of Distributed Ledger Technologies (DLT) in the transformation of Public Services.

Coordination, monitoring, and technical support are important goals for this WP. For this reason, a help desk system is used by the PUCs. More details can be found in deliverable D3.1 "Help Desk Space Thread: incident management system".

The four PUCs are the following ones: Public Funding Distribution (PUC1, FBA), Public Accounts Management (PUC2, CERTH-MUKA), Urban Logistics (PUC3, IMEC-VIL) and Data Valorisation Services (PUC4, UC-AYTOSAN).

PUC1 aims to bring experience in cascade funding projects. It deals with grant distribution via competitive open calls. It can lead to advantages such as reduced administrative burden and increased transparency.

PUC2's objective is to incorporate blockchain into active Smart Cities. In particular, it deals with public procurements and e-voting services, and it can lead to benefits such as saving costs and time, increased trust, real time expenditures, audit trails and participatory decision making.

PUC3 has the objective to assess the specific value of DLTs for urban mobility. The combination of DLTs and IoT can lead to more efficient logistics and better pricing. So, there will be greater customer satisfaction and less congestion in the city.

PUC4's goal is to improve citizens' lives, to increase urban services efficiency and to explore new economic models, based on data valorisation. So, the result will be a transparent solution for the evaluation and the valorisation of the use of data by third parties, without taking into consideration who is the owner of the data.

2.4 Sustainability Objectives

Our objective is to explore and prepare pathways to assure that the TOKEN BCPaaS can continue its operations, and even grow further once the EU funding dries up. The specific objectives are:

- O6.1. **Support the sustainability of the Pioneer Use Cases** resulting from the WP4, with specific actions to scale and maintain the PUCs operational in the pilot sites and, to reach early-adopters for replicability and take-up by using the DAPPs offered within the TOKEN BCPaaS.

- O6.2. S**upport sustainability of TOKEN BCPaaS as an "all-in-one" package of DLT services** that can support transformation of public services by using DLT beyond the project.

2.5 Impact Assessment & Policy

Evaluation Framework based on a systematic review of the literature on the benefits, risks, and challenges of using DLT (and other disruptive technologies) in public administrations was produced by TOKENs team This Evaluation Framework was then used to guide the analysis of current processes and contract the results achieved versus the ex-ante scenario. In addition, the Impact Assessment Plan regarding public authorities' development of pathways to introduce disruptive technologies was completed. Outcomes for Evaluation Framework were published as an article in a leading, prestigious international review, IEEE Access, respecting Open Access criteria.

In June-October 2021, WP2/4 updated its Evaluation Framework, enriching it by taking into account the impact of TOKEN in each of the technological, socio-economic, organizational- cultural, and institutional (legal and political) dimensions. This newly enriched Evaluation Framework included common evaluation questions for each issue of concern in its respective dimension. In addition, the PUCs worked hand in hand with these evaluation questions to produce common KPIs where possible, and specially tailored KPIs where required. These KPIs will be used in the upcoming months of the project to evaluate the impact of TOKEN. This work also provides extremely valuable inputs for the upcoming iterations of the Business and Governance Model.

2.6 MarCom & Community Building

Community building activities are led by FBA and Events by DEMOS. See WP5 for more information. WP5 is providing users' community feedback and early adopters using the BCPaaS for their prototyping. For such deliverable early adopters would be our key attention since we focus on Exploitation of results, and of course our first main clients

are the Early adopters in the PUCs. The Strategy for the Early Adopters is laid out later in Chapter 6.

BCPaaS was officially launched to the public on October 7, 2021. We currently have 9 people who requested access after the launch. They represent an important source of feedback for the future work of the Business Model (BM). The presentation of the BM Workshops so far discussed are detailed in Chapter 3.

In addition to this as a measure to maximize impact the below actions were defined to go from communication to exploitation (Figure 2).

Figure 2 – Actions to maximise the impact

3 Exploitation Strategy

This section shows the exploitation strategy for the TOKEN project. Initially, we present the innovative products defined at the beginning of the project. As the project evolved we welcomed a more exhaustive list of innovative products which are also shown in this section under the innovation radar. The radar gave us more granularity to see further the possible exploitation products of TOKEN. And it is being used as a reference here and in the next series of deliverables. Then, we present the exploitation plan as initially defined at the project genesis, which continues evolving as we gather further inputs from the experience of the users. Next, we show the exploitation plan and vision and the Business idea under the Open Canvas Business Model (OCBM), fulfilled by the elaboration of 2 workshops. Finally, we present some aspects of sustainability of the TOKEN platform partner perspective.

It is also important to consider that:

The TOKEN exploitation strategy tries to maximise the project impact by:

- **Designing a business plan** for the TOKEN BCPaaS that will support the sustainability of the Pioneer Use Cases and of the TOKEN BCPaaS itself. The plan is described in Chapter 4.
- **Positioning the TOKEN BCPaaS as a sandbox infrastructure for public service** operators to optimize work processes and to integrating evidence-based decision-making processes in public services; The positioning of this will be achieved by
- **Disseminating the findings obtained in the impact assessment process** for enabling public authorities to develop pathways for the introduction of DLT while also addressing the societal challenges raised by such technologies

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3.1 What To Exploit

3.1.1 TOKEN Innovation Potential & Innovative Products

The innovation potential of TOKEN covers the four categories of innovation considered in the Oslo Manual for measuring innovation as follows:

- **Product and service innovation**: TOKEN provides a totally new Blockchain Platform as a Service Solution that includes significant improvements in technical specifications, components, and functional characteristics for developers and CTOs of operators of Public Services. Moreover, at least one of the Pioneer Use Cases is focusing on the creation of a totally new Public Service oriented to the valorisation of Data generated by Smart Cities. (PUC 4 Santander) helped by the radar tool provided by the European Commission shown below
- **Process innovation**: Three of the PUCs will be focused on providing a significantly improved **delivery method** for existing public services, while the fourth one (data valorisation services) creates a **novel service**. This implies significant changes in techniques, equipment and/or software for delivering such services by using DLTs.
- **Marketing innovation**: TOKEN will provide an Open Commons Business Model as a marketing innovation that will involve significant changes in the pricing of the technology stack for public service transformation.
- **Organisational innovation**: TOKEN will test a Distributed Governance Model for the sustainability of the TOKEN BCPaaS that will result in a new organisational method in business practices and external relations among operators of public services. The advancement of this work is described in this deliverable.

Table 1 provides an overview of the innovative tools related to TOKEN. Further innovation and revisions coming from the PUCs are continuously added. One of the findings on work of the TOKEN Observatory reminded us that there is a need for careful consideration into what kinds of innovation is needed, and how it is regulated, supported, and integrated into public services, both in the current and an ideal system of governance – this includes the wisdom to assess when DLT is not the right approach. This is initially taken in account with a table developed in section 3.6.4 on deciding if DLT is the right approach or not.

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Table 1 – TOKEN Innovation items list

ID	Name	Acronym	Token partner leading	Current status	Funct. Description link	Technical spec.	Test reports	Area	Type of innovation
I01	Token Platform offering plug-and-play services and open-source components for building decentralized apps and services	TokenPlatform	FBA	In test	D1.1, D1.4	https://docs.token-project.eu/	TBD	Token Services/Components	Product and service innovation
I02	Token Notarization - STAMP API	STAMP	FBA	In test	D1.1, D1.4	https://docs.token-project.eu	TBD	Token Blockchain Notarization Services/Components	Product and service innovation
I03	Token Registry Anchoring API (Blockchain Storage)	Anchoring	FBA	In test	D1.1, D1.4	https://docs.token-project.eu	TBD	Token Blockchain Notarization Services/Components	Product and service innovation
I04	Canis Major, a DLT adaptor for FIWARE technologies	CM	FF	In dev.	D1.1	https://github.com/FIWARE/CanisMajor	TBD	Token Blockchain Notarization Services/Components	Product and service innovation

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I05	Decentralized Identity - Token Connect	Connect	FBA	In test	D1.1, D1.4	https://docs.token-project.eu/	TBD	Token Decentralised identity	Product and service innovation
I06	CERTH SSI services provide individuals and organizations with the ability to control and manage their identities as well as their digital credentials	CerthSSI	CERTH	In test	D1.1, D1.4	https://docs.token-project.eu/	TBD	Token Decentralized Identity	Product and service innovation
I07	Token Storage network - IPFS web gateway and storage and pinning service	TSN	FBA	In test	D1.1, D1.4	https://docs.token-project.eu/	TBD	Token Decentralised Storage	Product and service innovation
I08	Token Streams	Stream	FBA	In progress	D1.1, D1.4	https://docs.token-project.eu/	TBD	Messaging and event streaming	Product and service innovation
I09	Funding Passport - Improving the public funding process	Passport	FBA	In dev.	D2.3		TBD		Product and service innovation
I10	Management of Public Accounts with DLTs for improving transparency	MPA	CERTH/MUKA	In dev.	D2.3, D3.3		TBD		Product and service innovation
I11	Dynamic Access Controller, granting	DAC	imec	In dev.	D2.3		TBD		Product and service innovation

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	access rights for the city								
I12	Data Valorisation Services based on DLT for boosting IoT data economy	DVS	UC/AYTO SAN	In dev.	D2.3		TBD		Product and service innovation
I13	Distributed Governance Model	DGM	ITR	In spec	D6.3			Project management, Governance	Organisational innovation
I14	Open Commons Business Model for the sustainability of the TOKEN Platform & Pioneer Use Cases	OCBM	FBR		D6.2				Product and service innovation

The following table (Table 2) provides a description of the above-mentioned tools.

Table 2 – Description of TOKEN innovative tools

TokenPlatform	The TOKEN platform is the first platform which provides access to a range of state-of-the-art decentralized technologies. The platform allows developers to prototype in an easy way using plug-and-play services with no need to develop complex architecture and components. In production environments, the platform can be used as a service by accessing the rest of the APIs, or the open-source components can be used. Benefits are a reduction in development time and cost. Key DLT components are provided as services: notarization, decentralized storage, and identity.
Registry	A REST-API to provide tamper-resistant, immutable On-Chain storage.
CM	Canis Major is an adaptor that is easy to use, and it can be integrated by solutions that are developed using FIWARE technologies. Canis Major provides configurable options such as a choice of blockchain/DLT where you want to store your data. Here user does not have to write any code or develop any smart contract for the reason that Canis Major has inbuilt required technology which user needs for integrating blockchain/DLT

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	in their solutions.
Connect	An Identity Wallet implementing the DID AuthN profile for OpenID Connect.
CerthSSI	By using Token's CERTH SSI implementation, individuals and organizations can create new connections and exchange credentials following the SSI principles. The credentials are stored in a secure wallet which provides quick and easy access to them, and also CERTH's SSI functions as a service. Following the same direction, any organization, agency, municipality, or governmental service, in general, can take advantage of the unique characteristics of SSI.
TSN	IPFS - providing a decentralised network for storage. chunked into parts and replicated in different nodes. Replaces a typical cloud infrastructure. No single organisation administering the data.
TimeStamping	A REST-API to provide anonymous, tamper-proof time stamps for any digital content as a for Proof of Existence of a given document, data or transaction in a given time.
Stream	Instead of having a central machine handling the different jobs, the messages are distributed among different nodes. It is using Kafka from the apache foundation.
FP	Funding Passport is the pioneer use case for providing users with an easy way to apply for funding. By creating and populating their funding passport with their data, they can easily check their suitability and apply to different funding opportunities. The purpose of this use case is to show how DLTs can help in providing a better service for end users, and using the services of the Token platform to comply with GDPR, privacy, and data portability. The passport provides for users an identity layer that can be used regardless of their location and allows them to maintain control over their own data and who is authorized to access it. There is currently nothing similar to this on the market.
MPA	An innovative solution regarding the management of public accounts is to use Distributed Ledger Technologies (DLTs). The solution will empower civil servants, citizens and policy-makers in the terms of control and accountancy of the public funding distribution in a transparent way. In addition, an anonymous and secure e-voting system for municipalities procedures enhancement will be provided in order to allow citizens to be involved in participatory decision-making, empowering in this way social trust.
DAC	The Dynamic Access Controller is a system that enables city administration (for logistics service companies) to grant additional access rights (e.g. local goods) to the city in return for meeting certain sustainability measures. In order to do so, it uses the trust in distributed network.
DVS	DVS is a service to design, deploy and assess a FIWARE based architecture which provides DLT services for data traceability and valorisation of urban ecosystem data. The solution will provide the basis for managing SLA (Service Level Agreements) upon the Smart Contract paradigm.

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DGM	**The DGM provides guidance for the governance of BCPaaS maintenance and DLT projects in the form of a policy that can be tailored to a specific context. It also provides an audit or review template to measure gaps with regard to ISO TS 23635 Blockchain and DLT – Guidelines for Governance. Thus it supports the evaluation and implementation of appropriate governance for DLT service involving infrastructure providers, application providers, end users, and including functional, security, legal and data protection, innovation aspects in form of policies, procedures, responsibilities, and agreements.**
OCBM	**Model that encourages sharing of knowledge under open licences. On the basis of the common balance of collaborative platform economy, commons collaborative economy can be defined as a tendency, a set of qualities, and a modality of collaborative platform economy - regarding both the design and the performance of the process characterized by a common approach regarding the dimensions of governance, economic strategy, technological base, knowledge policies and social responsibility of the externalization impacts of the platforms.**

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3.2 Exploitation Plan & Vision

Table 3 shows the initial exploitation plan for the results for the TOKEN project which summarizes key points on how the results will be exploited by indicating the audience (potential users), communication channel, and finally the targeted impact of TOKEN in coming years.

Table 3 – TOKEN PEDR at project start

Table 2.2.(a).1 – 1. TOKEN -PEDR Overview

Project Results	Main Uses (What)	Users (who)	Channels (how)	Follow up (Impact)	
				End of Project	3 years later
TOKEN BCPaaS	DLT integration in Public Services	Developers and CTOs of public service operators	TOKEN Observatory, communication plan, events & early-adopters campaign	4 PUCs + 10 early adopters	100 adopters
Public Funding Distribution	Improving workflow procedures for productivity, co-creation and transparency	Policy Makers - Civil servants of any type of Public authority - intermediary bodies (NGOs)		€20M of Public Funding fully tracked by the PUC implemented	Recommended Best Practices for intermediary bodies under Horizon 2020 - More than €100M a year fully tracked
Transparent Management of Public Accounts	Improving workflow procedures for productivity, co-creation and transparency	Policy Makers - Civil servants of municipalities and regions		€20 M of Public Funding fully tracked by the PUC implemented	Recommended Best Practices for municipalities - More than € 1,000M a year fully tracked
Last mile logistics in Smart Cities	Lowering admin burden and increasing automation	CTOs of Smart Cities - Operators of Public Services in Municipalities		3 spots producing yearly savings of 7.5 tons of Co2 emissions* and 2,500 Hours of transport in Leuven	10 spots producing yearly savings of 25 tons of Co2 emissions* and 8,335 Hours of transport in Leuven
Valorisation of Datasets of Smart Cities	New methods of Data commercialization	CTOs of Smart Cities		Data Marketplace launched	30 datasets integrated with blockchain technologies
Toolkit for Policy Makers	Guidance & policy recommendations	Policy Makers		800 downloads of the Toolkit	5,000 downloads
Research papers	Knowledge transfer	Researchers	Publication in specialized research channels	3 Publications in relevant Journals	Impact factor: first quartile

* Calculated based on the following Co2 emissions equivalent: 0.5 Kg of Co2 per kilometre of distance.

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3.3 Business Idea – What we know

TOKEN business ambition is to contribute to support the sustainability of the TOKEN BCPaaS and the Pioneer Use Cases by developing a Business Plan based on the principles of the Open Commons Collaborative economy

An overview of the outline Business Plan foreseen for the 'TOKEN' results is included hereafter. We should distinguish here among '**Business Model**' and '**Open Commons Business Model**' as we will refer in this section to both terms.

- We will define the concept of **business model** (a concept for which there is no consensual definition in the literature)[1] as "the distinctive and fundamental principles and mechanisms by which an organization deploys a strategy to create, sell, and use values (of use and change), in order to fulfil its primary goals" (Harracá, 2017).
- We will define the concept of **open commons business model** as "those models that encourage sharing of knowledge under open licenses, from free to some rights reserved" (Tebbens, 2017). On the basis of the commons balance of collaborative platforms economy, commons collaborative economy can be defined as a tendency, a set of qualities, and a modality of collaborative platform economy - regarding both the design and the performance of the process - characterized by a commons approach regarding the dimensions of governance, economic strategy, technological base, knowledge policies and social responsibility of the externalizations impacts of the platforms. In this regard, commons collaborative economy is characterized by:
    - favouring **peer-to-peer relations** -in contrast to the traditionally hierarchical command and contractual relationships detach from sociability, and merely mercantile exchange - and the involvement of the community of peers generating in the governance of the platform
    - being based on **value distribution** and governance among the community of peers, and the profitability is not its main driving force
    - being developed over privacy-aware public infrastructure, and resulting in the (generally) **open access provision of commons resources** that favour access, reproducibility and derivativeness
    - and, finally, the **responsibility towards the externalities** generated by the process.

[1] Mayo et al, "Multidisciplinary Framework on Commons Collaborative Economy", DECODE project (GA 732546), last modified 2017.

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3.4 Exploitation Strategy

For the TOKEN platform, we selected the OCBM to support BCPaaS. In addition, the concrete impact of the **OCBM is the extension of the three followings 'boxes' (Figure 3):**

- CC Licensed Work - **what products within the TOKEN platform should be considered to be licensed**. For example, the TOKEN platform could be Open Source, allowing the code to be freely used, modified, and shared

- Common Good - What is **TOKENS impact** in the (these points are thoroughly addressed in the Ex-Ante Scenario (Deliverable 2.2 via PUC interviews) :
    - **Legal:** which regulation Gap are we adding value to?
    - **Socio-Economic:** Investment gaps addressing? Cost and Benefits of DLTS/TOKEN
    - **Cultural Challenges:** which knowledge/Organisational and Workforce Gap are we addressing?

- CC licensees - **what license to use** to ensure that the work produced within TOKEN has the most impact for the users: Open Common Business Model as **"those models that encourage sharing of knowledge under open licenses, from free to some rights reserved" (Tebbens, 2017)**

For applying the OCBM, we have defined a business model canvas (BMC) which allows us to identify key OCBM elements useful for the exploitation and sustainability plan in the TOKEN platform. The BMC is shown in Figure 3, and the separated boxes present key elements of OCBM related to the TOKEN platform.

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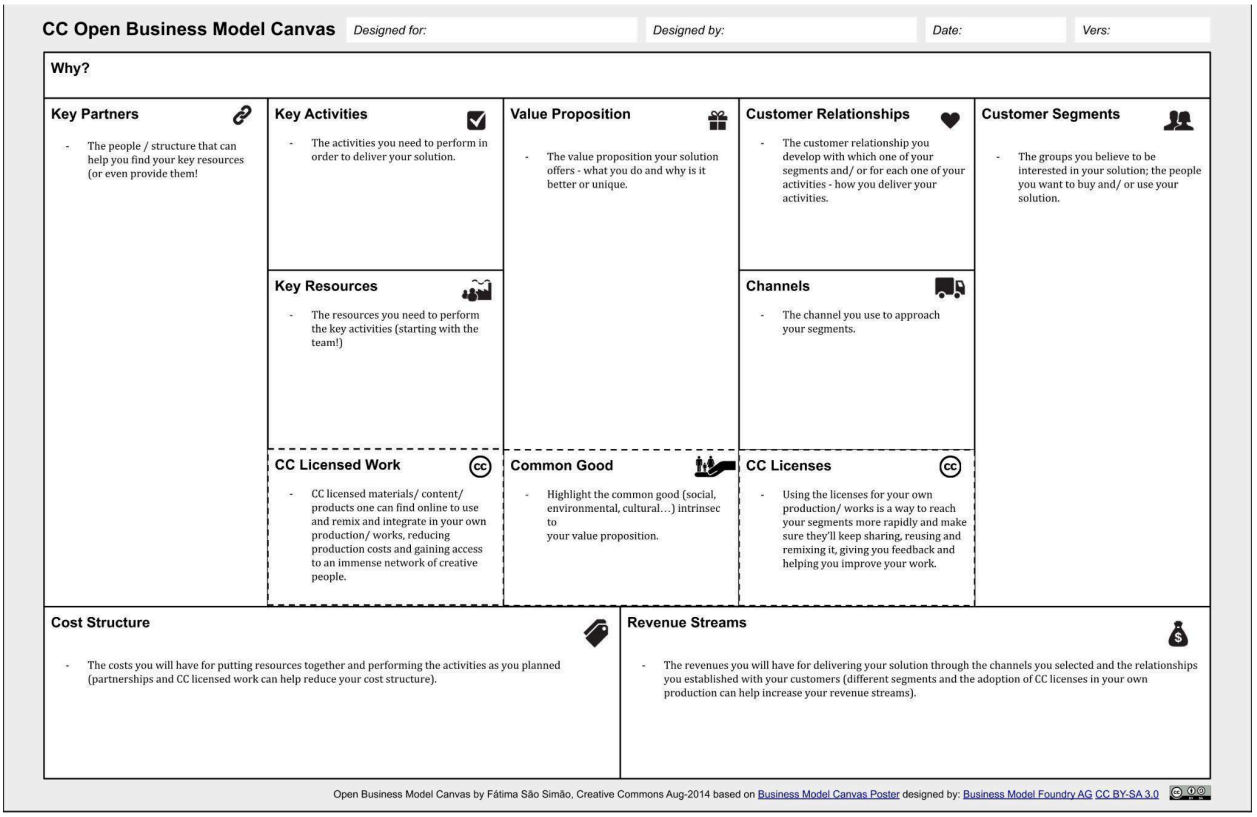

Figure 3: Overview of the TOKEN Business Model canvas

To fill this BMC we designed three workshops to fill each of the boxes of this canvas (Figure 3). The goal was to validate each box by exchanging it with end users. It's important to note that a BMC evolves constantly and will be adapted all along with the project, and even after the project (a first version of the TOKEN BCPaaS can be found in section 3.1) This process will continue asking key questions to partners, and gather feedback from the 4 PUCs, to issue an answer to the following question: **is there a business model for TOKEN platform, based on Open Commons, that can sustain itself in time?**

- If yes, what is it and what should be the implications of a partner?
- If not, how can it be linked to an **existing project or program** to take advantage of the knowledge created during the project?

The goals of each workshop were the following:

- **Workshop 1**: Defining a value proposition of the TOKEN platform
- **Workshop 2**: Exploring the willingness to pay off the end users and the willingness to sell of the tech providers
- **Workshop 3**: Finalising the last version of the BMC.

It is also important that during this process, lessons are learned from interactions with PUCs. This means that mistakes will be made, useless actions might be undergone but the end goal is to confront them. We will also focus on gathering the most inputs

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possible from new prospects (potential clients who will go through our onboarding process) to optimise elements of BMC.

3.5 Workshop 1: TOKEN Platform Value Proposition

3.5.1 The Goal

In this first session, partners and PUCs worked together on the **Value Proposition**. The goal was to see how both sides correlate to create a product that customers need by filling the value proposition canvas (Figure 4) which gathers the needs of customers and confronts it with the product that is being developed.

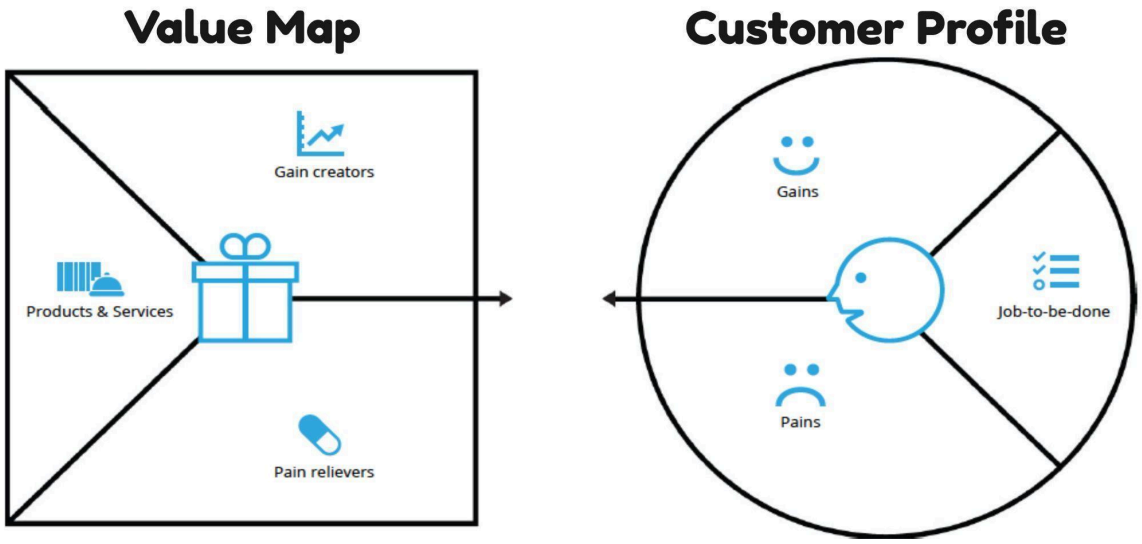

Figure 4: Value Proposition Canvas

The workshop was conducted via MIRO, a collaborative **tool** that allows participants to create post-its and be fully engaged in each part of the workshop.

3.5.2 The Context

A review on the concept of Creative Commons (CC) was given and examples of successful products based on CC licenses were presented:

- OpenDesk (Conversion of Digital to physical): download the file of the furniture and modify (open source) and/or build it yourself. Or contact a local maker via the website to help you produce the furniture you are interested in. Figure 5 shows an example of OpenDesk.

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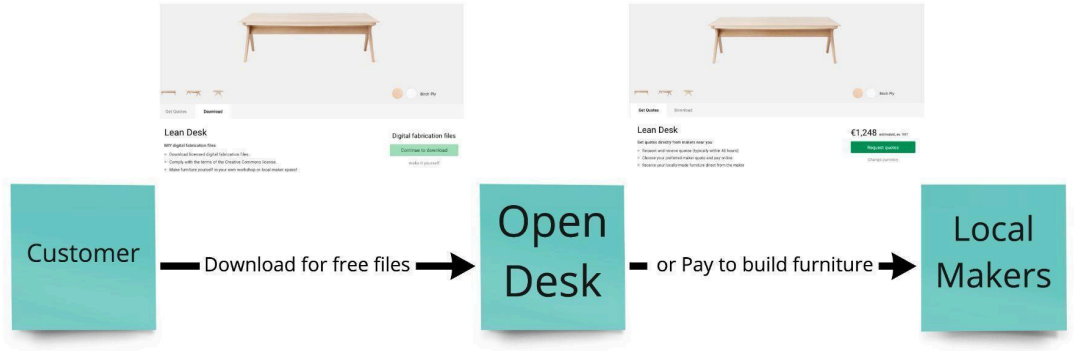

When customers download an OpenDesk product:
1. user can customise the file to their needs
2. non-commercial only in DIY way
3. Building furniture requites special milling tools

When customers buy an OpenDesk product directly from a registered maker they pay:
1. the manufacturing cost as set by the maker
2. a design fee for the designer
3. a percentage fee to the OpenDesk platform

Figure 5 – Open Desk process

- Cards Against Humanity (Conversion of Digital to physical): the game is available online for free by downloading it in .pdf format, as shown in Figure 6. The user can also choose to receive it home in physical format for *x* amount of money.

Figure 6 – Cards Against Humanity process

- Wikipedia (Donation): allowing users to donate the amount they feel is right for the usage they make of the platform, as showin in Figure 7. They can also decide not to donate anything which does not alter the functionality of the platform.

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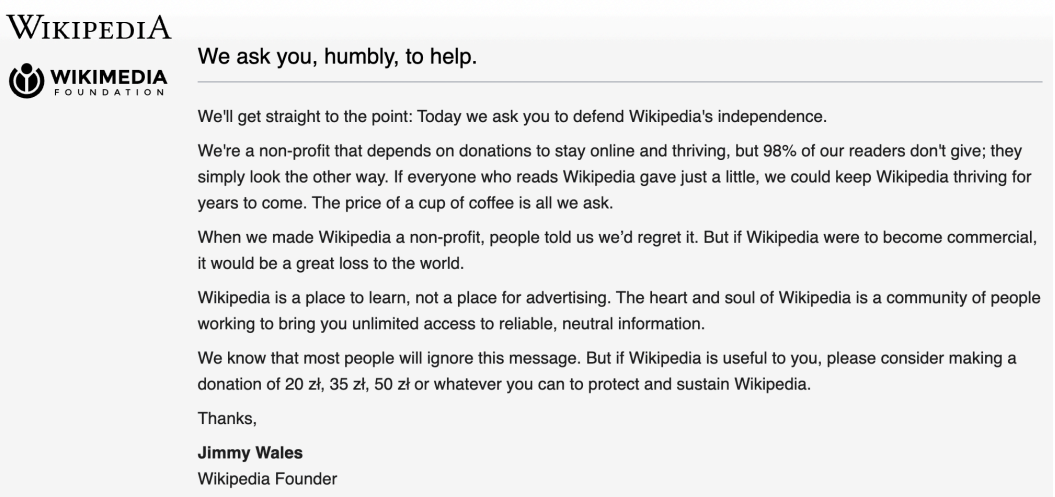

Figure 7 – Example of Wikipedia page for donation

- Icons for everything (Matchmaking): basic functionalities for free (download and modify) but if the user wishes to download images in better quality or in specific format he will have to pay a subscription fee, as show in Figure 8.

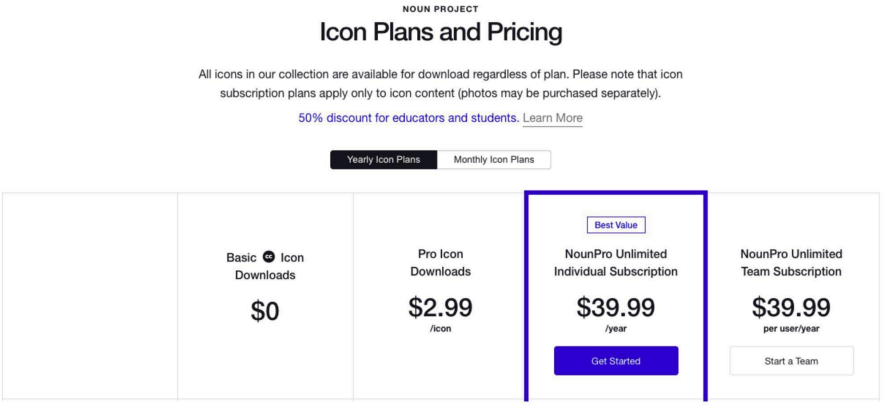

Figure 8 – Icons for Everything

After reviewing the concept of CC all partners attending were split into three break-out rooms to work on the value proposition canvas. Smaller groups allow more interactions between partners. We then obtained three canvases and the target audience of the TOKEN platform was also defined.

3.5.3 Results

The three canvases obtained were regrouped into one single canvas offering an overview of the challenges of the TOKEN platform (see results in Figure 9). A similar work done by Universidad of Cantabria in the **Deliverable 2.2,** which consisted of interviews to

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workers or civil servants of each PUC, is aligned with the feedback gathered during that workshop.

These results were then used to update the BMC (see Figure 10).

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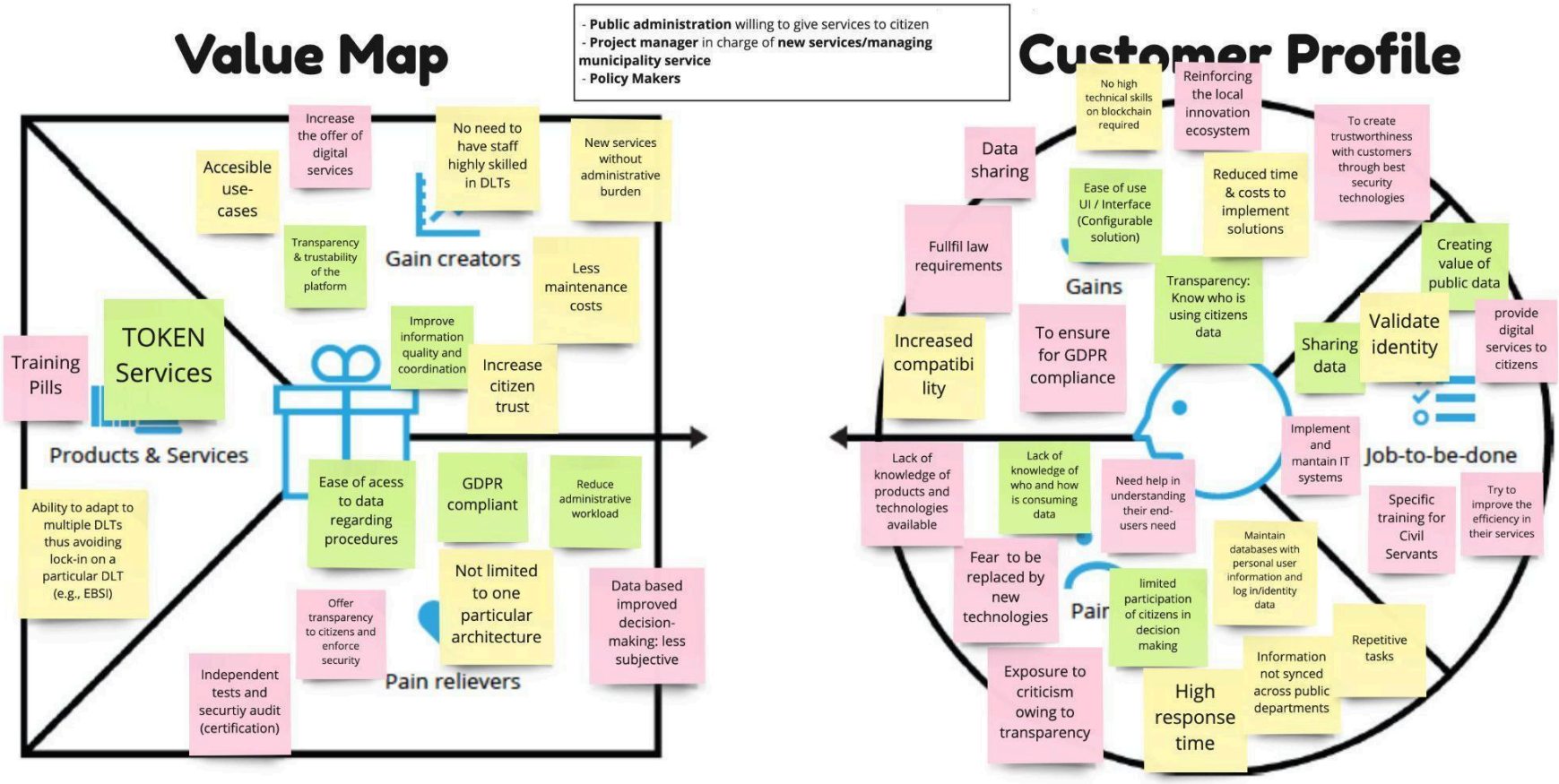

Figure 9: Value Proposition Canvas after Workshop

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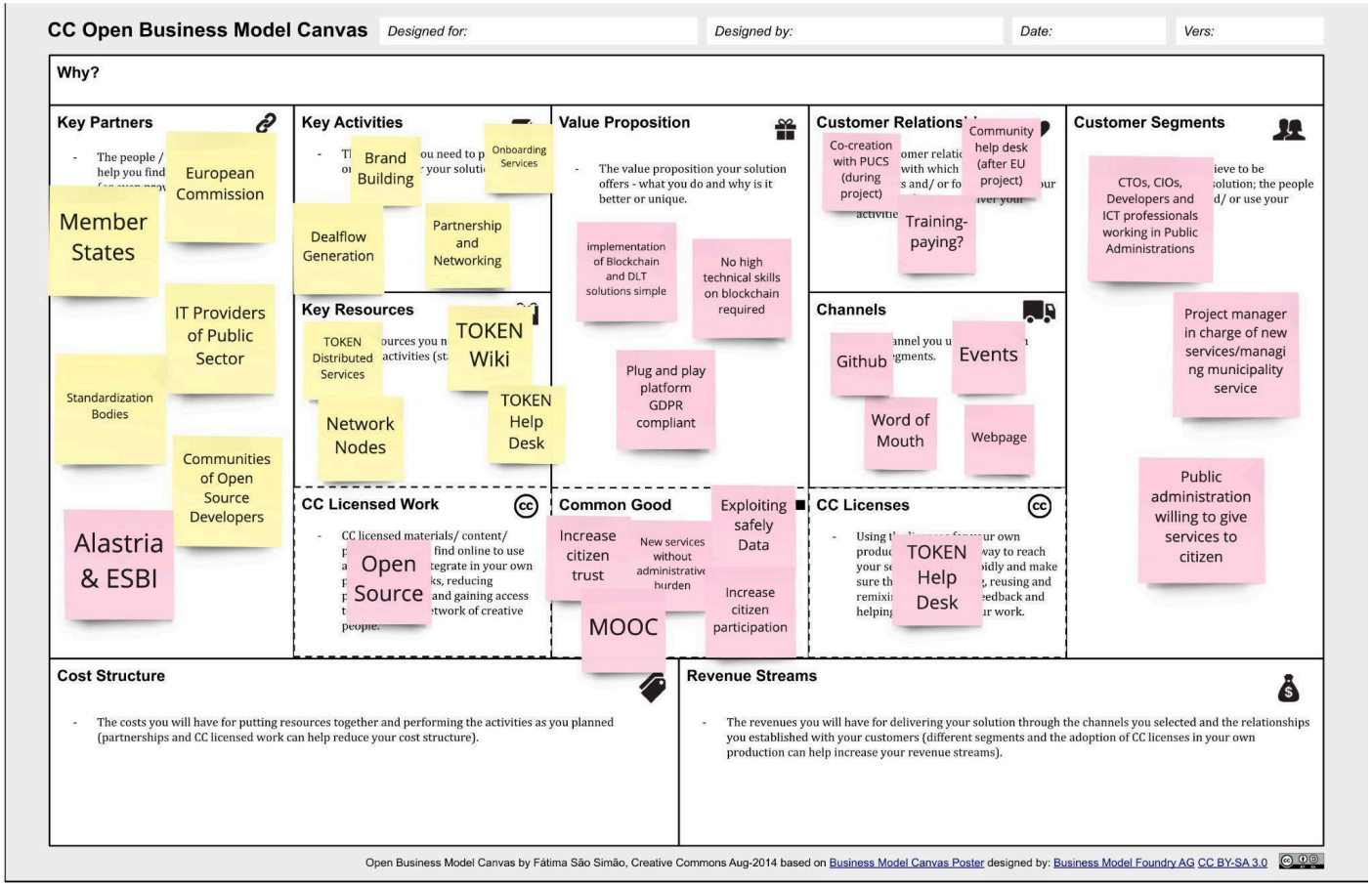

Figure 10: BMC with insights of Value Proposition Canvas (in pink)

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3.5.4 Conclusions from Workshop 1 and next Steps

A few points to retain from this workshop and final value proposition canvas are:

- The speech to showcase TOKEN services and products towards civil servants should be: *services that will help digitalise and simplify tasks, and allow more power to citizens. Indeed blockchain and DLT technologies are words that reflect complexity and can scare off potential users. This is important to take into consideration when presenting the platform.*
- The legal perspective is also essential to ensure the civil servants to evolve in compliant data environment and give them arguments towards citizens that their data are handled well, and the administration can be trusted.

Therefore, the value propositions of the BCPaas:

A simple plug-and-play GDPR-compliant platform requiring low technical skills on DLT technology for users.

The workshop contributed towards an updated version of the BMC. Each post-it added should be confronted with the reality of the market with PUCs as new users or with early adopters. Therefore those hypotheses will get feedback once the first early adopter will be unboarded to the TOKEN platform. This will be reflected in the next deliverable.

The actions triggered to update the BMC are the following:

- **Clarify the customers** of the **TOKEN platform** (the ones who will be deciding and buying the services) and the **users** (the one who will be using the products)
    - One step towards this clarification will be done via the analysis of the first access request following the launch of the TOKEN platform which took place in October 2021: 9 requests (out of 50 participants) were made the day of the launch of the platform and through Task 6.4 led by Infrachain (Activating and engaging early adopters).
    - Then a f**ollow up survey** will be sent to explore the onboarding questions
    - A **customer journey map** will be iterated following the constant feedback of first users (Figure 14).
- **Clarify** what are **the products developed within TOKEN**. There's a **lot of products** being developed so it's important to understand **how they'll integrate to the TOKEN platform** and **when they will be ready**. These results will be shown during Workshop 2.
- **EBSI** and **Alastria** may be one of the **DLTs to adapt to**. A discussion and alignment with both of those providers will be ongoing. Currently the status is:
    - It is planned to modify the CERTH SSI wallet already being used by Token to be EBSI compliant.
    - We are exploring the possibility of making all TOKEN APIs EBSI compliant in order to be aligned with the European strategy to be EBSI-compliant, meaning any solution designed for one network can be replicated in another. This will ensure interoperability among networks. TOKEN could

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help ESBI in promoting that all solutions in the public administration (and also private sector) are based on the same set of standards for application development.

    - TOKEN is already a member of Alastria and it is planned to deploy some of the services on the Alastria network such as the blockchain notarization service.

- **High and specialized technical experts** are the **main barrier to developing** this kind of TOKEN solution. In this regard the following report from the OECD: The uncertain promise of blockchain for government (recommend to check p.13 and 16) is a good way to measure the necessity for a client to use DLT technology. An idea is to implement in the onboarding of a new customer a form evaluating this need.
- See benefits also from other perspectives such as legal, socio-economic not only functional perspectives: the distributed governance model (see **deliverable D2.2**).
- Explore Revenue streams and Cost structure of the BMC (topic of **workshop 2**).

3.6 Workshop 2: Setting up Hypothesis for Revenue Streams and Cost Structure of BCPaaS

3.6.1 The Goal

The goal of this workshop was to create some new hypotheses related to the Revenue Streams and Cost Structure of the Business Model Canvas. It is essential to have this clear from a consortium point of view to facilitate the decision when the uptake of the platform will have to be discussed.

3.6.2 The Context

In this second workshop an overview of the last workshop was given with a summary of the Value Proposition canvas integrated in the general BMC (see Figure 11). Following those conclusions, and having clear the desirability section of the business model canvas, it was now important to finalise a first version of the BMC by focusing on the viability section: what is it worth? In other words, what are potential revenue streams and cost structure of the TOKEN platform?

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Figure 11 – BMC divided in 3 main sections Feasibility, Desirability (workshop 1) and Viability (workshop 2)

A work, prior to the workshop, was done to measure the need for each component and services developed by the tech providers for the PUCs.

Table 4 – Synthesis of Services and Components possibly used by PUCs

Service		PUC1 (FBA)	PUC2 (CERTH)	PUC3 (IMEC)	PUC4 (Santander)	Total
Blockchain Notarization	STAMP API	**Yes**	**Yes**	No	**Yes**	3
	Anchoring API	**Yes**	No	No	No	1
	FIWARE Canis Major	No	No	**Yes**	**Yes**	2
Decentralized Identity	Token Connect	**Yes**	No	*Under Consideration*	No	2
	CERTH SSI	**Yes**	**Yes**	*Under Consideration*	No	3
Decentralized Storage	Token Storage Network	**Yes**	*Under Consideration*	No	**Yes**	3
Messaging and Event Streaming	Token Streams	**Yes**	No	No	No	1
	Total	6/7	3/7	3/7	3/7	

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Service		PUC1 (FBA)	PUC2 (CERTH)	PUC3 (IMEC)	PUC4 (Santander)
Blockchain Notarization	STAMP API	It will be used for the time stamping of application submissions to an open call. This will ensure that applications have been submitted on time and not modified afterwards (The hash of the document will be stored in the blockchain). This will create an audit log.	It will be used for the time stamping of the required documents of tenders for procurements. It will be used as a Proof of Existence to ensure that applications have been submitted on time and not modified afterwards (The hash of the document will be stored in the blockchain). Also, this will create an audit log.	Not planned to use this service as Canis Major will be used.	Stamp API will be used to log the consumer access of the data.
	Anchoring API	Possibly will be used to store some metadata from the application in the blockchain (under investigation).	Use case does not require this service now.	Not planned to use this service as Canis Major will be used.	Currently no requirement to use this service
	FIWARE Canis Major	Not required as FIWARE technology not in use for PUC1	Use case does not require this service now.	Notarization will be used to track orders/order changes and the delivery of orders for locally and non locally sourced goods within the city of Leuewen. Canis Major is the best choice because since FIWARE technology is already in use. A private blockchain will be used but still needs to be decided on. A hash of the order will be stored in the blockchain and a timestamp of the event. Maybe be additional events logged, such as an audit trail of order/delivery status etc.	The subscription serivce and authorisations will be managed by the FIWARE components Canis Major will be used to detect out of range data. E.g. if a sensor stops working. This will ensure the quality of the data. The context broker will check that the values are in range and make sense.
Decentralized Identity	Token Connect	Token Connect will be implemented as an authentication mechanism, allowing users to verify control of an existing DID and use it to log in into the funding Passport.	Use case does not require this service because Certh SSI solution will be used.	Will start with the FIREWARE capabilties for authorization but may use the Token connect in the future for identity management. However, identity management is not key to the PUC3 use case at the moment. The main goal is that the login is safe.	Currently no plan to use this service. Identity components don't apply to to this PUC because it is machine to machine and SSI cannot be applied from machine to machine and it would complicated to implement due to the fact that FIWARE components are being used.
	CERTH SSI	Possibly will be used in the future for identity management.	Decentralized Identifiers will be used for secure communication and information exchange among the participants (using DIDComm protocol). Verifiable Credentials, containing various attributes, will be used in different stages of both the procurement and voting procedures. In addition, in future releases, participants may login to system using Verifiable Credentials.	May use in the future as an identity provider for logistic providers and consumers.	Currently no plan to use as FIWARE components are being used (as above)
Decentralized Storage	Token Storage Network	All documents linked to public profiles will be stored into public datastores within the Token Storage Network (i.e. Logos, images, videos...) Other binary data will be uploaded to private datastores (i.e. Private documents, Applications attachments...)	Token Storage Network may replace the traditional databases from MUKA for storing all the public documents in order to have a shared, tamper-proof and publicly available data storage that will be accessed by different entities(citizens and public services). When the procurement is closed, the corresponding documents will be uploaded within the Token Storage Network. At the moment, this data will be uploaded to MUKA data storage and can be accessed only through MUKA. (under investigation)	Storage will be handled by the Context Broker so there is no need for this service. There is no need to store files as the system will not be an ordering system. The system will just receive the minimum information in order to control the access to the city.	It will be used to store the Service level Agreements for users. The marketplace will allow the user to subscribe per use or per month and pay a corresponding fee. The plan is to monetize the datasets provided by external providers.Each of type of subscription will require a different type of SLA and these will be stored using the Token Storage Network.
Messaging and Event Streaming	Token Streams	Token streams will be used to handle all notifications sent to the users, including: notifications to applicants about potential funding opportunities, on the status of their application or also requests from funding bodies for further information.	Use case does not require this service now.	Given the use of a Context Broker and its associated communication mechanisms, there little need for this service for PUC3.	Currently no requirement for this service

The synthesis of these answers (Table 4) was used to measure the **willingness-to-pay (WTP) of the PUCs.** WTP is a key element in a business model. It explores how much a client is willing to pay for your service or product you are developing. A set of key questions was defined and were answered by each PUC during this second workshop in order to evaluate this WTP.

In parallel we explored the **Willingness-to-sell (WTS)** declarations of the commercializing partners (tech developers: CERTH, FBOX, and FIWARE). Even though part of the TOKEN platform will be open source, it's important to understand what possible annex revenue streams could be created for partners. The overall results of these metrics are reported on a chart which will help to set a customer price for the product or service (Figure 12).

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Figure 12: The Value Creation Opportunity

The questions addressed to the PUCs and related to their interest in products and services offered by the TOKEN platform were:

- Would you be ready to pay for services/products of TOKEN Platform?
  - If YES, how much or what is the budget of your department* per year?
  - If NO, please let us know why
- Would you be ready to pay to complement those services? (ex. training, technical support…)
  - If YES to Q2, how much or what is the budget of your department per year?
  - If NO, please let us know why.

On the other hand, to measure the WTS the following questions were discussed with tech providers of the consortium:

- Are there any prerequisites for this solution implementation?
- What commercial activities could complement the services/components? (matchmaking, donation, consulting, training, locked features…)
- Stand alone product?
- What similar product do you already sell?
- If yes, how do you sell it? (via what revenue model for example)
- Any competition on TOKEN products/services?

The last step of the workshop focused on the uptake of the TOKEN platform. Meaning what structure will be created to sustain the platform after the end of the project - with no more funding from the EC. This part of the workshop was only destined to the tech providers and is part of a first towards the update strategy that will be led by Infrachain.

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The objective was to measure a partner's interest in up taking the platform and if yes via what kind of structure. The scope of the questions was the following:

- What structure (profit, non-profit)?
- What resources will you be willing to invest? (Money, Person/hours)
- What product or services will you be ready to propose?
- New users/clients strategy?
- Any association/community we could propose TOKEN to? Complementarity (EBSI, Alastria..)
- Business Model? Add on to your own services?

3.6.3 Results

From PUC perspective

Difficult to gather concrete information from them. The issue comes from the different layers of individuals in each PUC. Knowledge owners for each topic are very specific: who will use the platform, who takes the decision, who takes care of the budget? Classic complexity of public administration structure which shines a light on the challenges ahead of the TOKEN platform: who is the person in charge of taking decisions in each administration?

The main feedback we had is gathered in the following table:

Table 5 – Willingness to Pay of PUCs

	PUC1	PUC2	PUC3	PUC4
Would you be ready to pay for services/products of TOKEN Platform?	Yes. 1200€/year	Yes. 2000€ from Department of Planning, development and organisation	No. We consider a model where the logistics provider would cover the cost of operationalization of the services.	Yes, we could make an initial investment but the maintenance and upgrades should be paid for by marketplace revenues.
Would you be ready to pay to complement those services? (ex. training, technical support...)	1000€/year. We have in house knowledge already but if we need support, we are willing to	Yes. 500€ from Department of Planning, development and organisation	Yes	Yes, as a way to promote the platform

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	pay for that			
Comments		The responses are based on previous, similar procurements of the Municipality and are only approximates	Above answered need to be checked and validated by the City of Leuven	There is a need for a clear business model, assessing the point of view of stakeholders and other considerations.

Feedback we collected:

- Impossible to have a donation model (like Wikipedia) for such a platform. As public entities it's not possible to engage in such financial process
- Clear structure of each entity needs to be drawn to know who does what. This is key to develop a marketing strategy and understand who we should target:
  - Decision maker
  - IT person
  - Budget manager

Training is a service that could be added to the platform to support the implementation of new TOKEN tools in an institution. It can be one source of revenue. There's always a section of public administration budgets dedicated to training. MOOC format could also be an option and this case would be an Open Source training module. Referring to the previous Value Proposition canvas it is also part of teaching of DLT technology and part of potential common good created.

From Partners' perspective

Each block of services (notarization blockchain, decentralized identity, decentralized storage, Messaging) engage different types of cost. A first input was disclosed in section 3.1. "What to exploit". We will therefore describe a cost structure giving the services/components in Table 4.

Table 6 – Revenue Streams and Cost structure of TOKEN platform

Services/Components		Cost Structure	Revenue Stream	Onboarding questions	Possible Extra Revenue
Notarization Blockchain	Stamp API	Main cost is infrastructure and depends on traffic For example:	Cost will be put on the user -> use it for free, but with limits	How many customers will the client have?	Consultancy assessment about implementation
	Anchoring API				

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		Alastria -> Free Ethereum -> free if client has account			
	Canis Major	The entity operating the sw in production will probably require some compensation, depending on the model of the overall solution.	Open source part so should be free		Complimentary services
Decentralized Identity	TOKEN Connect	No Cost involved			Consultancy about SSI models implementation
	CERTH SSI	Depends on how many credentials the customer will issue	Some credentials for free -> for more you have to pay per added credential	How many users/customers will you deal with?	
Decentralized Storage	TOKEN Storage Network	Most expensive service-> depends of Volume	10Gb free -> for more storage you pay	How many Gb do you wish to store?	Consultancy about distributed storage
Messaging	Streams	Based on number of customers and transactions		How many users/customers will you deal with?	Consultancy about streams

Comments about Table 6:

- Revenue models and especially the ones based on traffic (CERTH SSI, TOKEN storage Network, Streams) will be adapted giving the usage and feedback of customers. That is why it is key to include the 'Onboarding Questions' in the onboarding process to monitor this information.
- Each service or component could offer consultancy services which will allow an extra revenue stream for the TOKEN platform. It will have to be measured based on the person/hour rate of the consultant. Also, the form: freelance or consultants from the TOKEN platform structure.

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- In the cost structure should be included the people working within the structure of TOKEN platform.

Following this last workshop an updated version of the BMC was made available (Figure 13).

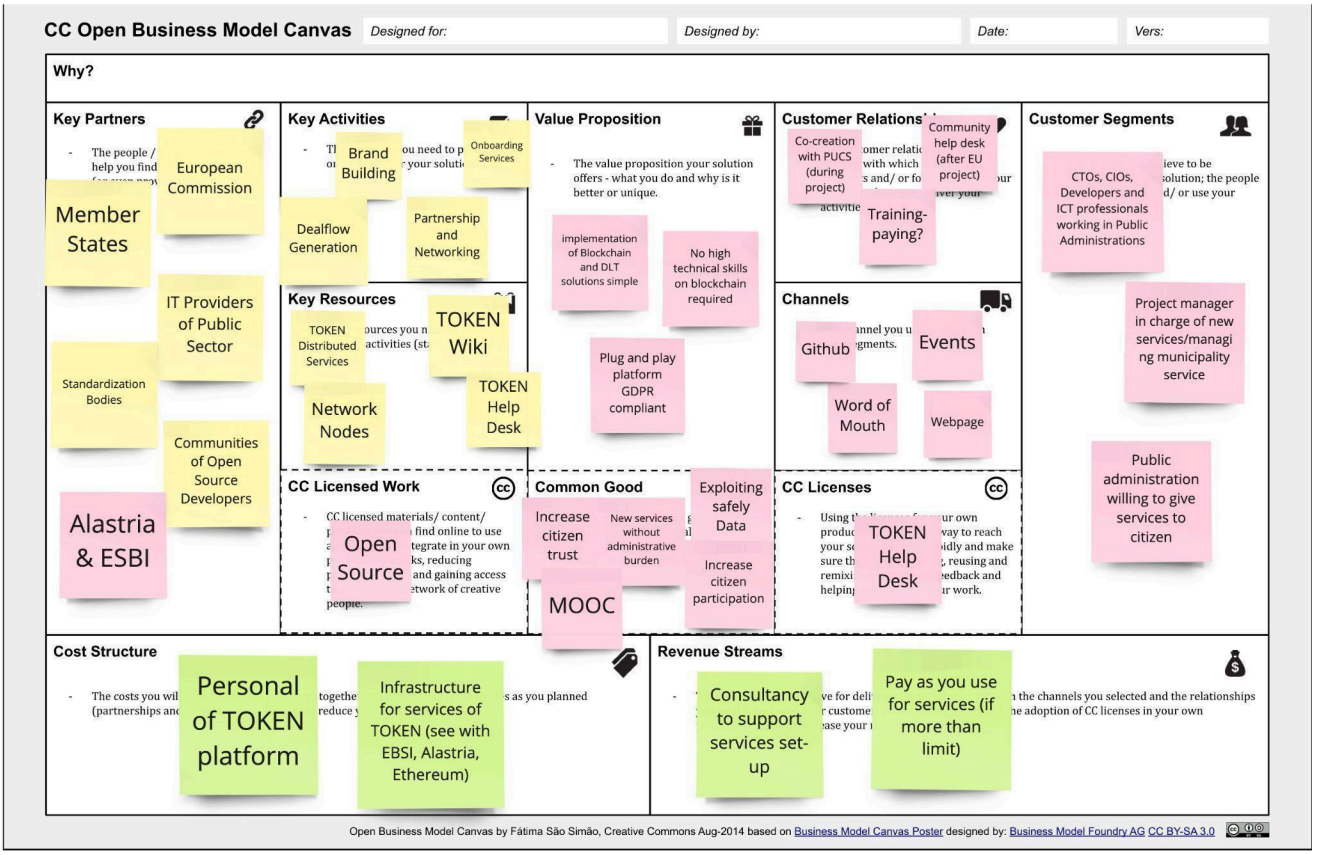

Figure 13 - Business Model Updated with Cost Structure and Revenue Streams

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The final part of the workshop was dedicated to exploring the sustainability strategy of the TOKEN platform. The main feedback is shown in the following table:

Table 7 – WS2 feedback on sustainability

	General Option	What Structure?	Resources willing to invest?	Product or services to be proposed?	New users/clients strategy?
FIWARE	Social, legal and cultural, impact FIWARE technologies will be still active after project	Depend on expectations on the consortium - Joint Foundation between FBOX, FIWARE, and CERTH	Training support for FIWARE Components related to TOKEN (DLT's) Person	Canis Major	PublicAdminnitration that would want to use DLT adaptors for their processes.
FBox	Important to be EBSI trusted party	Joint Foundation between FBOX, FIWARE, and CERTH	The technical maintenance and support for the components FBOX is responsible for.	Blockchain Notarization	We have access to both public administrations as potential customers; as well as private sector (investors).
CERTH	Important to be EBSI trusted party (already working with 2 nodes)	Joint Foundation between FBOX, FIWARE, and CERTH	Not yet defined?	CERTH SSI	Target Market: Greece

3.6.4 Conclusions from Workshop 2 and Next Steps

- The **Business Model Roadmap** has been updated (Figure 16) including the different perspectives of the consortium ensuring a strong **alignment between all parties.**
- The deliverable 2.2 by Universidad de Cantabria (UC) regrouping key **KPIs that matters for PUCs** will be followed up in the coming months. The feedback on the KPI will give a **marketing insight** when addressing the public administration: save X amount of working hours of your staff.
- A **financial model** will be drafted to allow **simulation of cost and revenue structure** and make some **financial projections**. It will support the decision on the type of structure to be created to support the TOKEN platform. We can

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already have a scenario with a municipality: 2000€/year for component/service and 500€/year for consulting/training.

- **Launch of the platform** and **first analysis of interested users (prospects)**. This will allow us to create a first **customer journey** and set up an **onboarding process** for new users. It is key to gather data and iterate the financials input (Figure 14). An interesting option for registration users would be to evaluate if DLT technologies is what they need. We will transform the process issued from OECD: The uncertain promise of blockchain for government as a questionnaire helping the prospect in the decision making (Figure 15). It would serve as a great market inbound tool.
- Workshop 3: updated version of the BMC thanks to iteration via first users and KPI update.

Figure 14 - Customer Journey Map of TOKEN platform user

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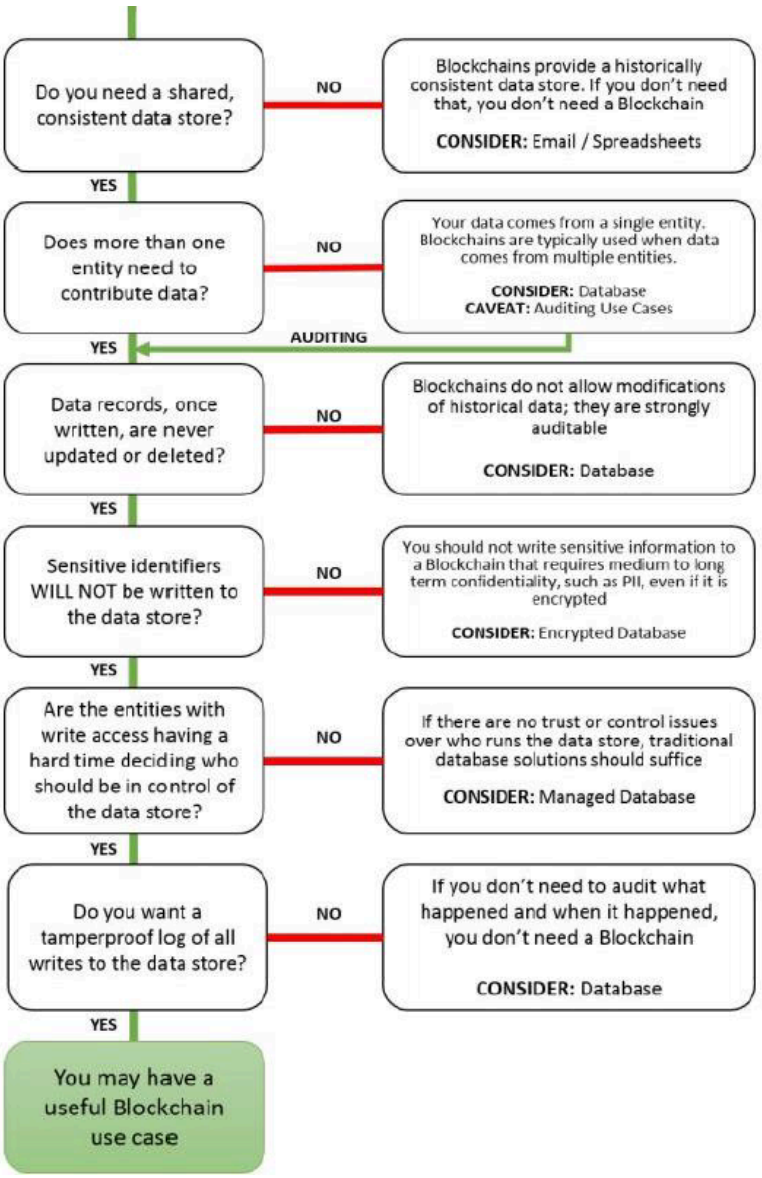

Figure 15 - Onboarding process to help prospect in their decision making to adopt DLT technology or not

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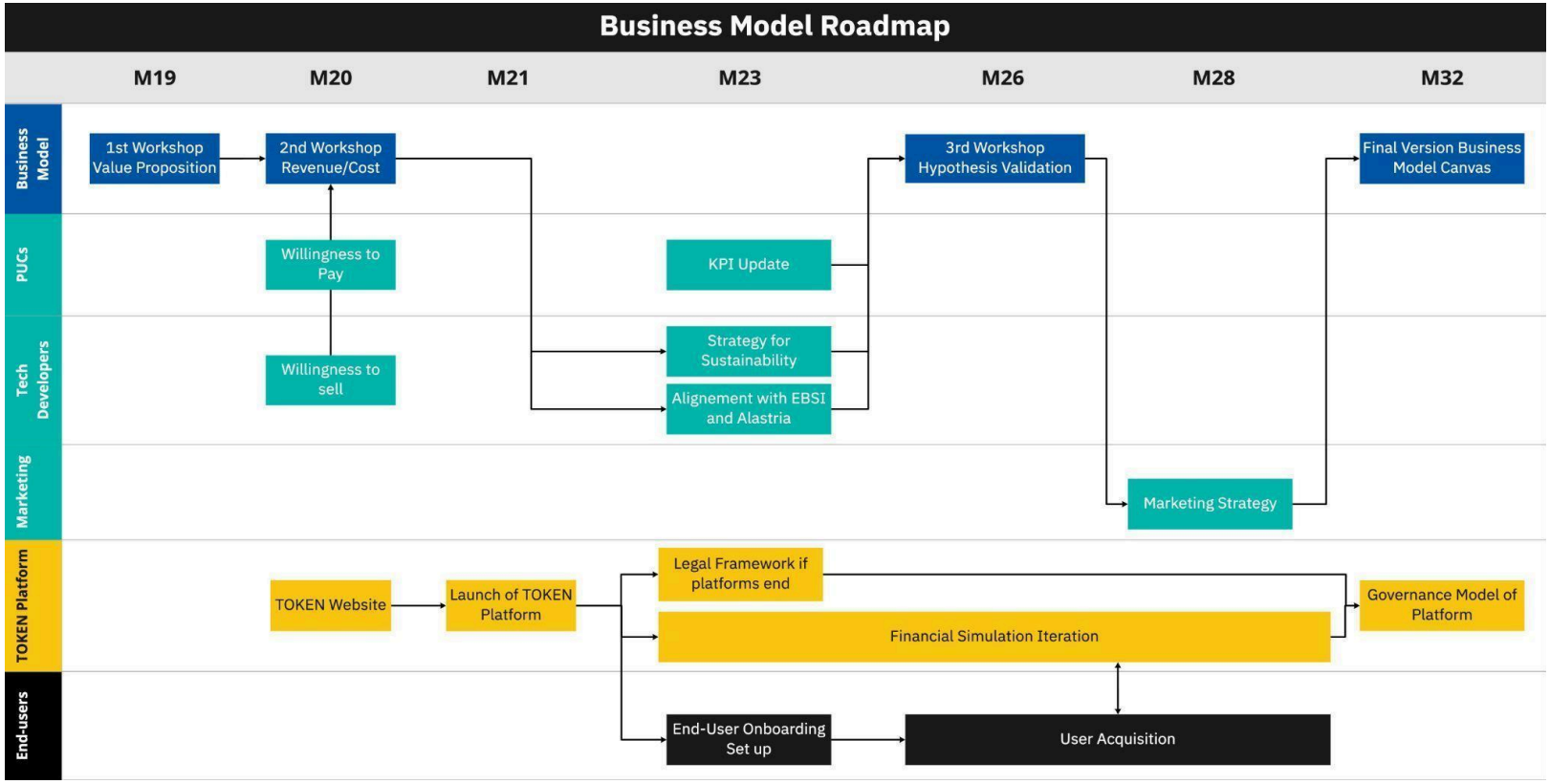

Figure 16 - Business Model Roadmap

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3.7 Workshops overall Conclusions

The roadmap to the business model (Figure 16) sets the perspective of the last 18 months of the project. The main focus from that point onward will be to gather new users to the TOKEN platform. (*Task 6.4. Activating and engaging early adopters (M18-M36)*) and in parallel gather data thanks to the onboarding process described in this deliverable (Figure 15). These data will feed the financial simulation spreadsheet and help the decision-making towards a governance model and sustainability strategy for the TOKEN platform. The BMC will go through various iterations along those 18 months.

3.8 Conclusion: Sustainability from a TOKEN Platform Partner Perspective

The initial exploitation (understanding) from different partners is already stated in Table 7 and in the proposal under the industrial/commercial exploitation per partner is expressed below.

Following, we present some detailed activities related to sustainability of the TOKEN platform from the partner perspective.

FIWARE Foundation

FIWARE brings a curated framework of Open Source platform components which can be assembled together with other third-party platform components to build Smart Solutions faster, easier and cheaper. CannisMajor, our FIWARE DLT Adaptor, is a blockchain adapter that supports TOKEN, the adaptor aims to submit the data to DLT powered by FIWARE Architecture. As a Foundation we promote the adoption of our technologies so we would be pleased to continue supporting Public Administrations that would wish to add blockchain processes using CanisMajor. We understand as well that DLT technologies are evolving so CanisMajor versions may also be evolving over time. Currently PUC3 (City of Leuven, Belgium) and PUC4 (City of Santander, Spain) are using our CanisMajor.

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FundingBox

For FundingBox, TOKEN project is a strategic project, due to the company's strong interest in bringing the technology to the market and real use through PUC 1, the Funding Passport. The aim is to open up the TOKEN platform services and components to a wide range of organizations, with a special focus on public administrations as the primary target group. Furthermore, from the PUC (Funding Passport) perspective, FundingBox will contribute to the sustainability by engaging public administrations that are distributing innovation funding and also private investors, onto the Funding Passport platform as customers, making the results of the TOKEN platform development widely available to the European innovation ecosystem participants. Consequently, the TOKEN services help to strengthen the competitiveness of the European innovation and entrepreneurial ecosystem and contribute to strengthening our region's position in the global context.

CERTH

CERTH provides SSI (Self Sovereign Identity) service available for all PUCs. It is now used by PUC2 and it may be used by PUC1 and PUC3 as well.

Furthermore, CERTH is PUC2 owner. The PUC2 solution will empower civil servants, citizens and policy-makers in the terms of control and accountancy of the public funding distribution in a transparent way. The solution will be implemented for the Municipality of Katerini in the context of PUC2, but it will be able to be adapted for other municipalities as well.

Moreover, CERTH and the Municipality of Katerini have recently (2 November 2021) signed a memorandum of cooperation. The aim of this agreement is upgrading and modernizing the structures of Municipality of Katerini, by utilizing the know-how and infrastructure of CERTH.

In particular, innovative pilot use cases will be implemented in the Municipality of Katerini. CERTH and the Municipality of Katerini will participate together in project proposals and implementation, taking into account sustainability and exploitation.

VIL

VIL leads logistics optimization projects with a strong emphasis on sustainability. The main focus in TOKEN PUC 3 is to find a way to create automatic non-monetary incentives for sustainable last mile delivery and creating trust between the different stakeholders. VIL wil set up new projects to continue the basic fundamentals developed in TOKEN and PUC 3, concerning dynamic access control, and extend it with new

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parameters and user-friendly tools, together with it's cluster members: logistics companies, knowledge institutes (such as IMEC, also partner in Token) and Flemish cities. Therefore, VIL is looking at new Horizon Europe projects for fundings, but also at regional funding opportunities.

According to VIL, DLT and blockchain will play an important role in the further digitalisation of logistics flows, and the growing integration of different types of logistics flows into a holistic network of operations. VIL is looking towards the ALICE roadmap towards zero-emission logistics, through the concept of physical internet. Blockchain is described as one of the enablers to reach this goal.

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4 Plan for Activating and Engaging Early Adopters

This section provides a description of the current activities in T6.4 in months M18-M36 with the final deliverable scheduled at the end of the dissemination activities undertaken or planned during the TOKEN project, and those we foresee for after the project. In particular, this section describes the different objectives, means, and materials used to disseminate TOKEN ideas.

4.1 Task 6.4 Main Objectives and Target Audience

Task 6.4 aims to set up and operate a group of public organizations across Europe that might become preferred candidates to replicate the PUCs implemented in WP3 even before the end of the project.

The quantitative objective for T6.4 is to find and engage 10 early adopters before the end of the task (M36) and the consortium planned to have 100 early adopters of the four PUCs within 3 years after the project's end (ref. above Table 2 TOKEN - PEDR Overview).

4.1.1 Target Audience

Task 6.4 is creating a network of policy makers and technical experts coming both from the extended networks of the consortium and from reaching out widely within the EU countries. The core of this network has already been formed among the satellite virtual

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nodes that will follow each PUC. There are three main target audiences we are referring to:

1. **ICT and Open Source Technology communities focusing on technology and infrastructures for the public sector**
   This is the designated target for the BCPaaS.
   The plan of actions to let them use the infrastructure consists of technical webinars/workshops, and a dedicated online community for engaging the early adopters. We will also actively interact with groups on social media in order to disseminate the results and raise awareness on the PUCs.

2. **CTOs, CIOs, Developers, ICT professionals working within Public Administration**
   This is the preferred audience for the four PUCs. Our plan of actions consists mainly in organizing dedicated showcase events to each individual PUCs. We will also exploit the contacts gathered in the ecosystem mapping documents which all partners are contributing to. Business development representatives from T6.4 will contact the prospects directly via email, telephone, or invitation in order to organize one-to-one demo sessions of each specific Pioneer Use Case. We have also planned specific activities on LinkedIn.

3. **Policy makers and public administration representatives willing to innovate services to citizens**
   We can address this segment with actions aimed at downloading the Toolkit for Policy Makers as well as dedicated Delegation meetings to show them the PUCs.

PUCs' early adopter profile and technological dimensions are shown in the Figure 17.

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		PIONEER USE CASE Poland	PIONEER USE CASE Belgium	PIONEER USE CASE Spain	PIONEER USE CASE Greece
	Public Service	Grant distribution via competitive Open Calls	Mail post/ Mobility	Smart City Services	Public procurement
	Problems to be solved	Red-tape burden, transparency, trust. Data Silos, double-granting, biased distribution	Lastmille logistics in Smart Cities, automotion of delivery process	Market Valorization of Data Sets generated by Smart City IoT Platforms	Red-tape burden, transparency, trust. Data Silos, double-granting, corruption
	Service Operator	Public Private Partnership among EC and Non for Profit	Public Private Partnership among Ministry-City and Business Operator	Municipality	Municipality
	Early adopters Profile	EC, Ministries & Regions	Smart Cities	Smart Cities	All type of Public authorities
Technological Dimension	**eID (KYC+AML)**	✓	✓	✓	✓
	Proof of Stamp	✓	✓	✓	✓
	PbD DATA	✓	✓	✓	✓
	Digital Wallet	✓	✓	✓	✓
	eVoting	✓	✓		✓
	ioTinterop.		✓	✓	
	DATA interop.	✓	✓	✓	
	Blockchain interop.				✓

Figure 17 - PUCs Early adopters Profile and technological dimension

The action plan for attracting and engaging early adopters can count on the Ecosystem mapping and liaising strategy performed by partners and LTPs:

- Mapping consists of identifying organizations playing an active role at European scope in the different aspects of DLT and its application to public sector services. These organizations have been identified within the partners' networks scanning the general landscape of this domain. Also networks gathering groups of target users (e.g. regional governments, cities, funding bodies, etc.) or addressing DLT professional communities will be researched and identified.
  ALL partners and LTPs are collaborating on the collection of contacts in the document "Reporting template for ecosystem mapping" (WP5).
  Moreover all partners and LTPs will engage with the stakeholders mapped in our ecosystem through specific emailings, phone calls, invitations and workshops.
  At the end of Q3-2021 the list of contacts in the ecosystem mapping counted:

Table 8 - Ecosystem Mapping's Key Performance Indicators

TOKEN Ecosystem Contacts	**100%**	**97**
To be contacted	**65%**	**63**

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Contacted	**20%**	**19**
Collaborating	**15%**	**15**

- Liaison strategy outlines how the TOKEN initiative in general, and the TOKEN Community in particular, will collaborate with entities identified in the community mapping with special attention to the activities of related communities like eublockchainforum.eu by joining their forums (eublockchain.mobilize.io) or participating as speakers in events like Democracy4all (d4a.io). We will engage all these stakeholders in the upcoming events to support the early adoption of the TOKEN Platform.

4.2 Attract Early Adopters for the Pioneer Use Cases (PUCs) Results

Main activities here will be to attract selected newcomers from the activities of WP5 and, activate them as, firstly, followers through demo, workshops, and showcase events based on the PUCs and, secondly, adopters by committing to execute the individual roadmaps for take up and implementation [D.6.4.].

There is planned Communication and Dissemination activity (WP5) focused on supporting the activation and engagement of early adopters. The main objective of this campaign is to set up and operate a group of public organizations across Europe that might become preferred candidates to replicate the PUCs implemented in WP3 even before the end of the project.

We will engage with the stakeholders mapped in our ecosystem through specific emailings, phone calls and invitations. All partners are collaborating on the collection of contacts from the TOKEN ecosystem (WP5).

4.2.1 Workshops and Events

The dissemination events organized in WP5 from July 2020 until October 2021 attracted the interest of more than 400 participants.

These participants have been added to the ecosystem mapping document and are prone to follow up emails and calls to convert some of them into early adopters.

We will present few events' types to provide practical examples on our plan of actions for the events:

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4.2.1.1 TOKEN Launch Event

There were 74 attendees at the online event and 9 follow up requests to access the developer dashboard. These early adopters will have the opportunity to test the platform for their own use cases and provide their feedback, which will feed into the future development and improvements of the platform and its sustainability. Figure 18 shows the TOKEN Launch Event.

Figure 18 - Cover image for TOKEN Launch Event

4.2.1.2 International Events, National Events & TOKEN Policy Observatory

A set of two international events and three further TOKEN Policy Observatory sessions will disseminate the findings and message of TOKEN, encouraging key target audiences to engage with the project and help attract and identify possible early adopters (Figure 19). In addition to these, a further 8 national events will be organized near the end of the project (Q4 2022) by TOKEN consortium partners to disseminate the results of the project and at the same time help bring in potential newcomers from national networks.

The planned international event for 2021 has been moved to be held in conjunction with the FIWARE Global Summit in January 2022. Due to the ongoing pandemic, the session will be held in hybrid mode, presenting PUC plans and findings as well as the policy context to the target audiences of TOKEN. The international event for 2022 is pending to be scheduled, but will be held in Q4 2022, with the intention of disseminating TOKEN results, PUC experiences and proving the value of the TOKEN BCPaaS through these, in order to directly engage possible early adopters.

The TOKEN Policy Observatory operates a group of influencers (network of policy makers and technical experts coming both from the extended networks of the consortium and from reaching out widely within policy making think tanks across Europe) that might contribute to scale the impact of communication and dissemination actions and to attract a critical mass of newcomers. The main activity to reach those influencers is to organize a series of dedicated meetings to let the influencers dive in the PUCs and produce the TOKEN Observatory briefing papers that will be published along the project and compiled at the end of it. The Observatory sessions serve as a meeting

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place for more technically oriented people as well as those policy makers and public administration officials who are key players in pushing for adoption of DLT in public services – potential early adopters and key players in possible PUC scaling. More details on the implementation of the TOKEN Policy Observatory, structure and aims of the meetings are explained in the D5.1.

Two out of five Policy Observatory meetings were held from M1-M18, bringing together a selected group of policymakers, civil servants (from city level, national level and EU level), researchers, industry and forward-looking thinkers. COVID forced the meetings online, but this has enabled a wider group of people to meet than originally budgeted. One-to-one meetings outside the Policy Observatory meetings have strengthened ties of TOKEN to Observatory participants and this growing network can be used to identify and engage potential early adopters.

The first two Observatory meetings have both used co-creative futures studies methodologies to look at the development of DLT in the European public sectors. A first briefing paper was launched in December 2020, written on the basis of the first meeting and focused on a vision for trust-based transformation in the public sector through DLT.

Through the observatory we were reminded that the adoption of technology alone is not enough to solve the issues of trust. Increased participation and agency of citizens and public servants alike can help in building a culture that not only enables smoother transitions, but ultimately better services.

A second briefing paper was published in October 2021, focusing on uncertainties and future images of DLT in the European public sector Some of the questions will be good material for the next planned work of the project for e.g., How to conduct regulation and governance related to technologies that are very contextual in a rapidly changing operational environment? The third observatory meeting and deep dives with PUCs are planned in January of 2022, with a focus on creating scenarios for DLT in the European public sectors. A fourth observatory meeting in the spring 2022 will drill down what these developments mean for policy in cities and a final one at the end of the project will coalesce around learnings from the process, the toolkit for policymakers D4.4 and needed further steps in policy. These policy-focused dedicated sessions are on one hand exploring the enablers and roadblocks to PUC scaling in future contexts, and on the other are about proving the value of the PUCs to the potential early adopters involved in the Observatory sessions.

TOKEN Policy Observatory Meetings Plan

- TOKEN Observatory Meeting 1: Future vision of DLT in Public Services **Held Online.**
- TOKEN Observatory Meeting 2: Uncertainties and tensions of DLT for European public sectors. **Held Online.**
- TOKEN Observatory Meeting 3: Scenarios and building blocks for DLT Adoption in Public Services Planned Q1 2022 (FIWARE Global Summit in Jan 2022).
- TOKEN Observatory Meeting 4: Policy Recommendations to Cities, Preliminary conclusions. Planned in Helsinki.

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- TOKEN Observatory Meeting 5: final CaseStudies & Impact Assessment, potential application beyond PUCs. Location to be confirmed, in conjunction with an international event.

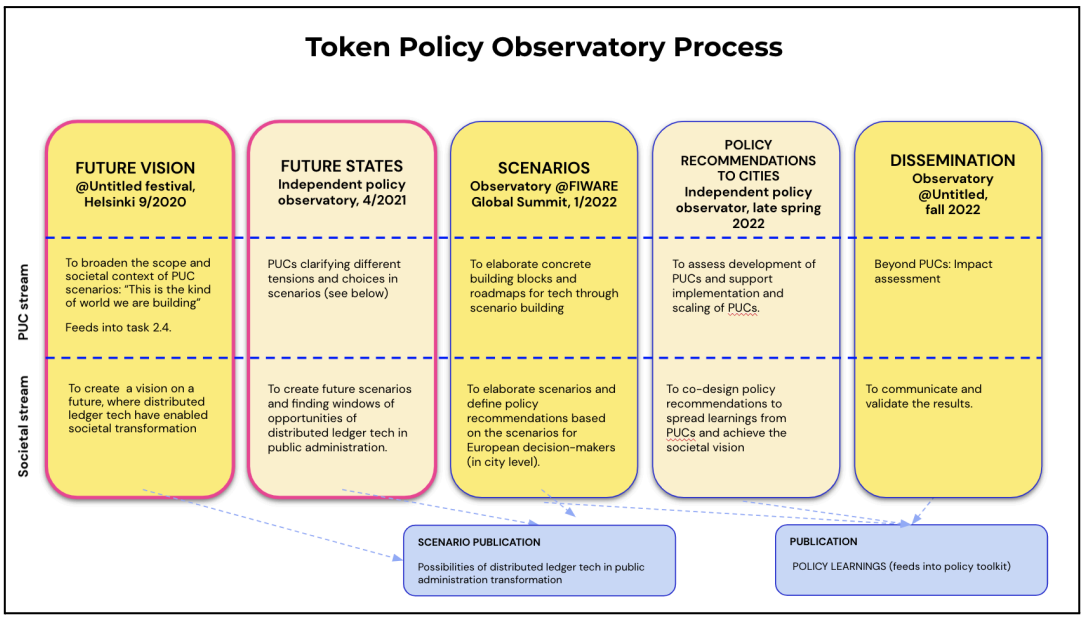

Figure 19 - TOKEN Policy Observatory Process

4.2.1.3 Workshop and Technical Events

Five webinars are planned in the grant agreement to share conclusions of the project amongst European CTOs and policy-makers of Public Sector agencies immersed in digital transformation roadmaps with a target audience of 400 attendees.

In the context of T6.4: Activating and Engaging Early adopters tasks, the events are more focused on developers and members of the IT communities. Those are the target segments for the BCPaaS.

We provide few descriptions of workshops and technical events:

- Infrachain Summit 2021
  This event is scheduled for the 18th of November 2021. Infrachain will organise a side-track on TOKEN as part of its annual conference Infrachain Summit on 18th November (www.infrachainsummit.com). The Infrachain Summit will be opened by a keynote of the Luxembourg Minister of the Economy Franz Fayot.
  The TOKEN side-track will focus on the presentation of the TOKEN BCPaaS by the technology providers. The objective is to present the potential of the BCPaaS and to identify potential early adopters.

- Blingathon
  This event is promoted by BLING - Blockchain in Government in conjunction with

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the North Sea Region. It is scheduled for the 13th and 14th of November, and it will cover most technical aspects of TOKEN.

The full list of events Workshop & Technical Events is available in WP5 - Token Dissemination and Communication Reporting - Partners' Activities Dashboard.

4.2.1.4 Demo and Showcase Events

Demo and showcase events will be part of the strategy to find and activate early adopters for the PUCs. As part of the dissemination strategy (WP5) PUCs will share learnings from pilot implementation to interested parties and potential early adopters in 4 different showcase events to be organised in each of the locations, provided that the Pandemic restrictions allow it, at the end of the project, focused on the specific application area piloted in each case:

- Warsaw - Funding Distribution
- Katerini - Accountability
- Leuven - Postal Services
- Santander - Data Valorisation

These demo events are scheduled for M26-28-29-31

Emailing and calling participants in the planned webinars to share conclusions of the project amongst all-EU CTOs and policy-makers of Public Sector agencies immersed in digital transformation roadmaps will be part of the activities carried out in T6.4

Moreover, we planned from Q4-2021 until the end of the project a monthly showcase events to specific member states delegations. To provide few examples:

- Infrachain will organise a presentation of the TOKEN project to a high level delegation from Uzbekistan led by the Deputy Minister of Justice on 15th November 2021 with a view to engage them as early adopters. The Uzbek delegation would like to learn more on Digital Transformation projects in the implementation of blockchain technology to the public service delivery in EU countries and the TOKEN BCPaaS could be an excellent tool for them. The Uzbek delegation will be composed of 11 members representing the Public Services Agency (4 people), Ministry of Justice (2), Ministry for Development of Information Technologies and Communications (1), Ministry of Foreign Affairs (1), State Cadaster Agency (1) and UNDP Uzbekistan (3). The visit is part of a Joint project of the Public Services Agency under the Ministry of Justice of the Republic of Uzbekistan, United Nations Development Programme in Uzbekistan "Improved public service delivery and enhanced governance in rural Uzbekistan" financed by the European Union.
- The active participants of T6.4 intend to organize a conference on the use of Blockchain and DLTs in the public sector in Q2/2022. The conference is planned to take place in Brussels. The primary target are potential early adopters in

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Benelux and the secondary targets are potential early adopters in other EU countries. Infrachain will seek synergies with other EU funded initiatives through co-organisation with the Interreg IV project BLING (Blockchain in government). The objective of the conference is to recruit early adopters for TOKEN by showcasing the PUCs and other relevant DLT projects in the public sector.

Note that the full list of events Workshop & Technical Events is available in WP5 - Token Dissemination and Communication Reporting - Partners' Activities Dashboard. However, the focus of this delivery is the events with the main goal to strengthen the sustainability of TOKEN.

4.2.2 Social Media Publications and Lead Generation's Campaigns

A curated selection of content has been used to broadcast what is going on in the TOKEN ecosystem with a special focus on contents provided through the Community Spaces (DLT4Gov). The strategy in WP5 has initially considered organic content that may be eventually combined with paid ads (on Twitter and LinkedIn, shown in Table 9) to reach the expected target audience. The following tables and graphics offer a summary of the dissemination activities performed in social media. We are using Twitter and LinkedIn Analytics tools to keep track of the performance of the publications in TOKEN owned channels together with a reporting dashboard for partner's contributions in their own social networks.

Table 9 - TOKEN Social Media Channels/Partners activity

Social Media Channels	
Twitter	Tweets: 136 (TOKEN) - 59 (Partners) Following: 244 Followers: 186 Engagement: 1.2% (average 3 months) Retweets, Likes, link clicks: 16, 61, 21 (average 3 months)
Linkedin	Network: 289 Updates: 86 (TOKEN) - 52 (Partners) Engagement: 9,4%%
Youtube	Videos: 6 Views: 377
Facebook	Posts: 13 (FIWARE)

As part of the objective for T6.4 we monitored these social media channels and answered comments and direct messages.

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In Q1-2022 we will assess if a lead generation campaign can add more contacts to our list of potential early adopters of the PUCs by raising their current work and future impact. The target audience will need to book a demo session filling a form with his/her name and work email.

4.2.3 Booking Management System for 1-to-1 Demo

Starting Q2-2022 we will work on presenting a new feature of the token-project.eu website. We will develop a new landing page to engage with the prospect contacts interested in the BCPaaS and/or any of the PUCs. Through this page they will be able to book a demo with a Business Development Representative (BDR).

The 1-to-1 demo page of the website will feature a booking management system where the users can see the available time slots of the BDR and book an appointment accordingly.

The demo will last 30 minutes and the BDR will explain:

- the value proposition and impact dimensions of the PUCs
- the results achieved with each PUC (KPIs)
- all technical aspects that could speed up the implementation for the early adopters

Talking about customer journey, the user will be able to access the demo page clicking the button with the label “BOOK A DEMO”. This call-to-action button will be very visible in the menu bar and in the footer of token-project.eu

Once this feature is implemented and tested jointly with partners from WP5.2 we will activate some social media campaigns to drive some traffic to the demo page. A specific call to action driving to this demo page should be used in all the planned PUCs webinars and other planned events.

Please note that all partners and LTPs will combine the effort to invite policy makers and IT people in the public sectors to book 1-to-1 demo from the newly created demo page.

We believe this feature will help in the dissemination of results and toward the T6.4 objective of acquiring 10 early adopters before the project’s end.

4.3 Retain and Nurture Early Adopters

In order to provide value for early adopters we will nurture their knowledge with contents specific spaces of the TOKEN website, sending newsletter and organizing events for early adopters.

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WP5 developed TOKEN owned channels for community building, and we will use these to disseminate the results to the community shown in Table 10:

Table 10 – TOKEN Upcoming Community dissemination activities

Upcoming activities Q4 2021 - Q1 2022			
Channel	**Action**	**Date**	**Content**
Web	Developers' Page Design	Sept 2021	Github Wiki Developer's Portal
Community Spaces	TOKEN Support	Sept 2021	General Q&A on TOKEN Platform (for early adopters) - Ready after platform launch event - Expert Group - Add/Link the TOKEN documentation to a space in the Community - wiki format.
	TOKEN Help Desk	Sept 2021	Specific Q&A on TOKEN Platform (for techies) - Ready after platform launch event
	TOKEN Observatory	Dec 2021	Private Space for Policy Makers - Specific emailing to the organisations in the Ecosystem Mapping + All leads gathered through the National Events + Observatory Meetings
Planned Webinars	PUCs x 4	Q4 2021 / Q1 2022	Emailing to participants in the planned webinars to share conclusions of the project amongst all-EU CTOs and policy-makers of Public Sector agencies immersed in digital transformation roadmaps.
International Event	3rd Observatory meeting	Q1 2022	This event could be collocated with the FIWARE Summit expected to be held end of January 2022

The public spaces of the TOKEN website, the developers' portal and DLT4Gov community will be valuable communication channels for the dissemination of the results.

The TOKEN Community Spaces have the initial design plan of the community is described in D5.4 Community entry points and included (Table 11):

Table 11 – TOKEN Community Spaces

PUBLIC SPACES	Associated collections
DLT4Gov (TOKEN) Updates Type: Forum	Articles, Announcements, Events TOKEN Partners: introduce yourself Guidelines for the community Similar communities
Blockchain for Policy Makers	Articles, Events TOKEN Platform Glossary
Blockchain for Techies	
TOKEN Observatory - Planned for the early adopters phase	Discussion Group for Policy Makers

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Pioneer Use Cases - Planned for the early adopters phase	**4 Discussion Groups. One per PUC**

The specific content relevant for policy makers and technical audiences have been split in two spaces:

- Blockchain in Public Services for Policy Makers
  A new collection has been created in the Space for Policy Makers with the TOKEN Project Outcomes such as the Policy observatory briefing paper.

- Blockchain for Techies
  This space will be used to engage our more technical target audience (CTOs, developers, etc.) around the TOKEN Platform following our first webinar presenting the platform.

Finally, one space per use case is foreseen to be launched at a further stage of the project and one related to the Policy Observatory members to support early adopters.

- PUC Funding
- PUC Public Accounts
- PUC Last Mile logistics
- PUC Data Valorisation
- Policy Observatory: for those participating in the observatory in a pre- and post-event.

These spaces developed in WP5 will be monitored by a community manager and a Business Development Representative (BDR) from the partners in T6.4

4.3.1 Community Surveys

Starting Q1-2022 we will submit customer satisfaction surveys with the community and the early adopters.

The main objective of the survey is to gather information about the satisfaction and the most requested features of the PUCs and BCPaaS. Specifically, these surveys will be organized in a way to extract information for PUCs capabilities and support for public services. That would help us to identify possible gaps and further extend our support for early adopters of the TOKEN platform.

4.3.2 Emails with Direct Link to the BCPaaS Training Material

To speed up the onboarding of the early adopters we designed specific emails with the hyperlinks to the training materials developed in WP5. Namely:

- **The Token Platform Website**: This is the website dedicated to the Token Platform. It gives an overview of the available services, including links to access

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the documentation/help desk and the developer portal.
https://platform.token-project.eu

- **The Token platform wiki:** The wiki provides all of the documentation required to start implementing a solution using the Token Platform.
https://docs.token-project.eu
- **The Token Platform Launch Webinar**: The Token platform was officially launched on the 7th of October 2021. The webinar recording includes an overview of the Token platform infrastructure and explanations of each of the services, including a demonstration of how to implement a solution. https://youtu.be/-dt27PZntCA
- **The Token Platform Launch Webinar Presentation**: The powerpoint presented during the webinar which gives an overview of the platform and the services.

5 Current progress on Governance

5.1 Governance of the BCPaaS Owner after the TOKEN Project

5.1.1 Introduction

In this chapter, we show the progress which was made regarding this project.

This chapter reports the key principles and guidance related to the governance scheme. It contains the prerequisites for a community driven BCPaaS with a view towards integrating it to any blockchain environment. It specifies the structure and organization of the project. As a next step we will be discussing the below principles, ideas and model structures internally more in depth in order to prompt further iterations to reach a suitable Governance model that can support the sustainability of the platform.

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5.1.2 Governance Principles

We identified in the currently draft ISO 23635 the governance principles that need to be implemented:

- Principle 1: Define identifiers of entities involved
- Principle 2: Enable decentralized decision-making
- Principle 3: Ensure explicit accountability
- Principle 4: Support transparency and openness
- Principle 5: Align incentive mechanisms with system objectives
- Principle 6: Provide performance and scalability
- Principle 7: Make risk-based decisions and address compliance obligations
- Principle 8: Ensure security and privacy
- Principle 9: Consider interoperability requirements

We explained to the TOKEN participants what this means, and we currently elaborate how this should be implemented by the Owner of the BCPaaS platform.

5.1.3 Governance for an Open-Source System

Governance is a 'system of directing and controlling'. In this chapter, we explain how TOKEN recommends open-source system implementers to direct and control its different activities.

The so-called TOKEN governance is spread out over multiple governance bodies and committees, each assuming a specific role. An initial proposal by TOKEN partner INF is reviewed to fit for TOKEN and is currently tailored to the specific context.

In this section, for each such entity, we indicate its:

a. responsibilities sorted by its duties to:
    1. assure
    2. communicate
    3. direct
    4. evaluate and
    5. monitor
b. members, indicating how members are selected, for how long
c. main activities
d. decision taking, indicating how decisions are taken in case of diverging opinions
e. performance, indicating deliverables, frequencies, and financial aspect of the operation.

These entities are:

1. the General Assembly
2. the Board
3. the Committee for Safeguarding Impartiality
4. the Committee for Financial Control
5. the Legal Committee

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6. the Certification Committee
7. the Profit and Loss Committee, and the
8. Product and Asset Committee.

Each committee, except for the Committee for Safeguarding Impartiality and the Committee for Financial Control, should be chaired by a member of the Board.

Figure 20 explains which entity elects, nominates, or validates the nomination of which entity. The relevant entity then reports in the inverse direction.

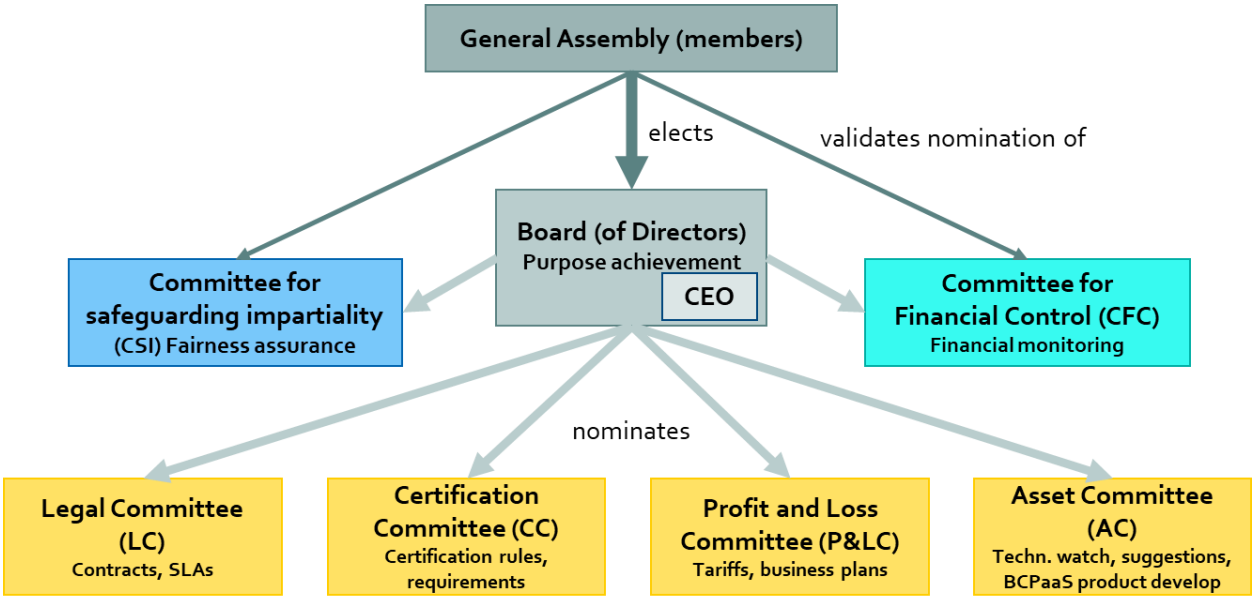

Figure 20: Governance bodies and nominations

In the following, we give the main responsibilities, whereas details are currently under assessment:

1. The General Assembly
   i. role and responsibilities defined in the bylaw/statutes
2. The Board
   i. responsible to assure
   ii. communicate
   iii. evaluate and monitor the processes and activities
3. Governance applicable to all Committees (each committee has specific responsibilities)
4. Committee for Safeguarding Impartiality
   i. assures fairness of contracts and certification criteria
5. Committee for Financial Control (CFC)
   i. documentation of BO transactions
   ii. reports on financial situation to the GA
6. Legal Committee (LC)
   i. assures BO compliance to relevant laws and regulations
   ii. evaluate compliance of BO activities to relevant laws and regulations

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7. Certification Committee
    i. assures creation
    ii. quality of governance scheme
    iii. communicate description of certification scheme and evaluate it
    iv. monitors NIS 2.0, verification conformity, auditor's performance
8. Profit and Loss Committee
    i. assures profitable activities of BO
    ii. fair pricing of BO
    iii. drafting of contracts and SLAs
    iv. pre-sales activities
9. (Product and) Asset Committee
    i. assure the BO's technical product creation, maintenance and quality
    ii. the BO's consultancy services
    iii. a technological watch over relevant IT fields
    iv. communicate software and all relevant documentation
    v. advice from its technological watch to GA
    vi. direct technical work on BCPaaS software
    vii. evaluate quality of software and monitor.

5.1.4 Roadmap

To build the governance structure the following roadmap has been defined, and presented in Table 12.

Table 12 - Roadmap – Action list

#	Action	Responsible	Deadline
1	Approval of this governance document	Board	
2	Define Committee members	Board	<date of next GA>
3	Define product specification	Product and Asset Committee	TBD
4	Write onboarding procedure for HOs and APs	Product and Asset Committee	TBD
5	Approve onboarding procedures for HOs and APs	Board	TBD
6	Write governance rules document	Certification Committee	TBD
7	Write specific document on rules regarding conditions and capabilities to forcibly halt a chain instance	Certification Committee; Asset Committee	TBD
8	Write certification scheme, process and criteria	Certification Committee	TBD
10	Approve certification processes and criteria	Board	TBD
11	Contract CB	Board	TBD
…	…	…	…

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5.2 Governance Review of DLT Projects

The current section, except for text marked in grey, is taken from a tokan document called Governance Review Template Document (GRTD).

We created a review methodology and check list helping DLT project managers to review the governance of their DLT solutions.

The methodology consisted in identified requirements and recommendations for reference sources, in this case DTR 23635. This information is then structured in a table form and organized in Sections and subsections, ideally maintaining the structure of the original standards. Then the requirements are completed by a description of verification items, further guidance, and potential issues that can typically be raised during the review.

Thanks to a Word macro, the structure of the tables is transformed to a work template, which can be used by the reviewer to document his review.

The reviewer selects the right answer for each verification item (Out of scope, OK, Not Ok, ...), completes the evidence considered, and removes or updates the potential issues.

Thanks to Word macros, the conclusion containing overview tables on findings and statistics can be updated.

Finally, the reviewer shall proofread and add his manual conclusion.

In the following section we show some extract of the GRTD, whose cover page is displayed in Figure 21.

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Partner itrust consulting is offering support to PUC when deploying this review.

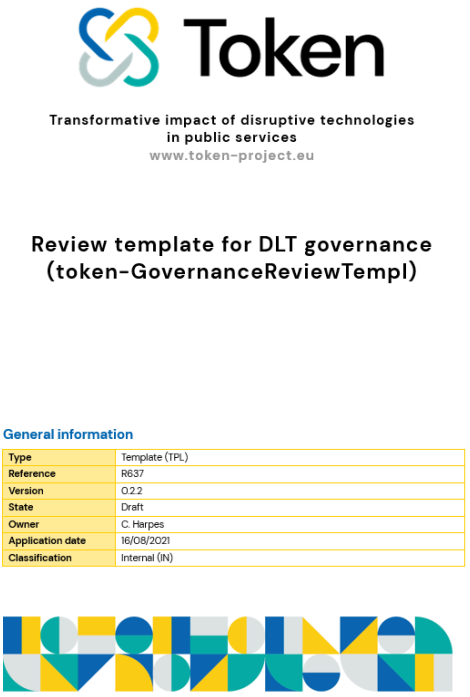

Figure 21- Cover page of the Governance review template

5.2.1 Extract from GRTD

5.2.1.1 Introduction

This document offers a detailed review on governance principles for blockchain and DLT systems, governance framework for DLT system, and the guidance on how to govern different types of such systems. The document also includes an assessment on how to govern DLT systems through its different lifecycle stages (establishment, operation, termination stage) and contexts (data, protocol, application, and institutional context). Details regarding role establishment and assignment in the governance framework, governance instruments and governance of interoperability are provided as well.

5.2.1.2 Detailed findings in GRTD

In this part, the reviewer encodes his observations and results. We used tables to provide a good overview. The blue elements (Figure 22) are decisions that the reviewer can select from a list of predefined fields.

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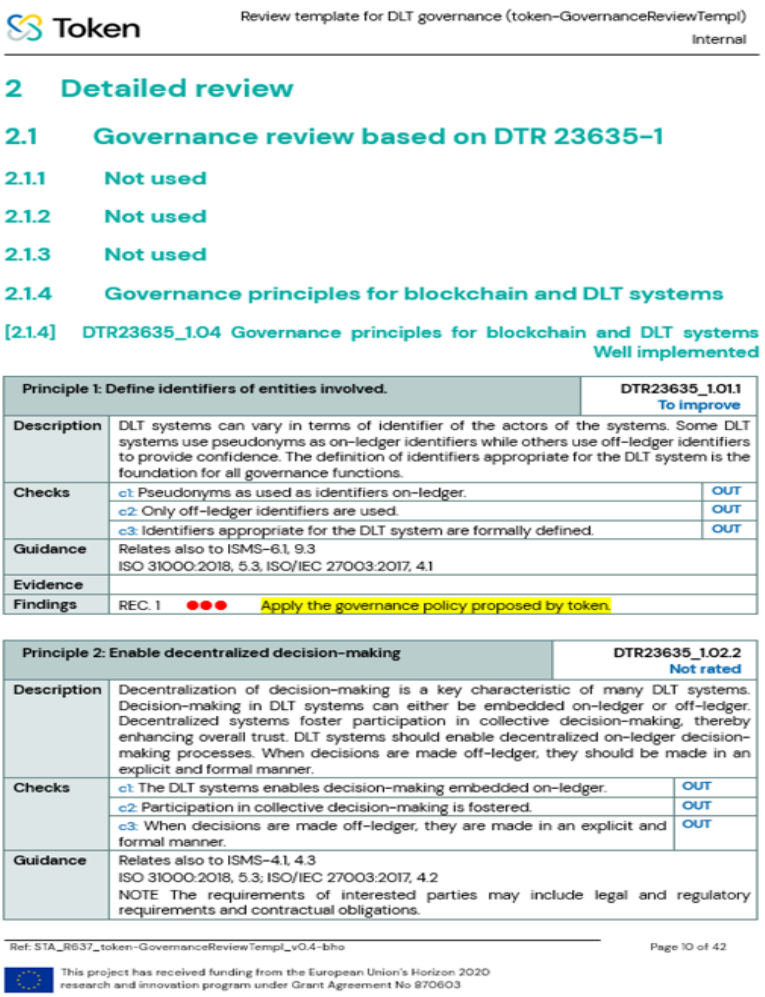

Token Review template for DLT governance (token-GovernanceReviewTempl)
Internal

2 Detailed review

2.1 Governance review based on DTR 23635-1

2.1.1 Not used

2.1.2 Not used

2.1.3 Not used

2.1.4 Governance principles for blockchain and DLT systems

[2.1.4] DTR23635_1.04 Governance principles for blockchain and DLT systems
Well implemented

Principle 1: Define identifiers of entities involved.		DTR23635_1.01.1 To improve
Description	DLT systems can vary in terms of identifier of the actors of the systems. Some DLT systems use pseudonyms as on-ledger identifiers while others use off-ledger identifiers to provide confidence. The definition of identifiers appropriate for the DLT system is the foundation for all governance functions.	
Checks	c1: Pseudonyms as used as identifiers on-ledger.	OUT
	c2: Only off-ledger identifiers are used.	OUT
	c3: Identifiers appropriate for the DLT system are formally defined.	OUT
Guidance	Relates also to ISMS-6.1, 9.3 ISO 31000:2018, 5.3, ISO/IEC 27003:2017, 4.1	
Evidence		
Findings	REC. 1 ●●● Apply the governance policy proposed by token.	

Principle 2: Enable decentralized decision-making		DTR23635_1.02.2 Not rated
Description	Decentralization of decision-making is a key characteristic of many DLT systems. Decision-making in DLT systems can either be embedded on-ledger or off-ledger. Decentralized systems foster participation in collective decision-making, thereby enhancing overall trust. DLT systems should enable decentralized on-ledger decision-making processes. When decisions are made off-ledger, they should be made in an explicit and formal manner.	
Checks	c1: The DLT systems enables decision-making embedded on-ledger.	OUT
	c2: Participation in collective decision-making is fostered.	OUT
	c3: When decisions are made off-ledger, they are made in an explicit and formal manner.	OUT
Guidance	Relates also to ISMS-4.1, 4.3 ISO 31000:2018, 5.3; ISO/IEC 27003:2017, 4.2 NOTE The requirements of interested parties may include legal and regulatory requirements and contractual obligations.	

Ref: STA_R637_token-GovernanceReviewTempl_v0.4-bho Page 10 of 42

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Figure 22 - Extract from Governance review template

5.2.1.3 Conclusion in GRTD

In the conclusion of this document (GRTD), we can see the results regarding the following aspects:

a. Assessment of review domains
   i. table with global result of security domains assessment for the targeted system.

b. Summary of the results per security criterium
   i. overview of the results per criterium according to a defined scale.

c. Summary of the check results per criterium and domain
   i. table with the summary of checks result and table regarding the distribution of check results per criterium and domain.

After X days of review on the targeted system, we conclude that "*TEXT TO BE COMPLTED BY THE REVIEWER*".

The tables below give a clear summary of findings, tests performed and security levels of the system according to the customer's needs in terms of scope, depth, and granularity of the audit.

5.2.1.3.1 Assessment of Review Domains in GRTD

Table 13 gives a summary of the assessment of the 0 domains considered during the audit and also the final evaluation of the compliance.

Table 13 – Global result of security domains assessment for the targeted system

Evaluation of the considered domains	Total/Type
Well implemented	7
Appropriate	0
Satisfied	0
To improve	0
Partly satisfied	0
Not satisfied	0
Not applicable	0
Out of scope	0
Global result	Partially satisfied

In conclusion, the audit of the system has been evaluated according to **…** of **…** domains included in the standard … and is considered as Partially satisfied.

Detailed Rating[2]

Table 14 – Results per security domain

Reference	Title	Rating
[2.1.4]	DTR23635_1.04 Governance principles for blockchain and DLT systems	Well implemented
[2.1.5]	DTR23635_1.05 Governance framework for DLT systems	Well implemented
[2.1.6]	DTR23635_1.06 Governance of different types of DLT systems	Well implemented
[2.1.7]	DTR23635_1.07 Governance throughout the DLT system lifecycle and contexts	Well implemented
[2.1.8]	DTR23635_1.08 Roles in the governance framework	Well implemented
[2.1.9]	DTR23635_1.09 Governance instruments	Well implemented
[2.1.10]	DTR23635_1.10 Governance of interoperability	Well implemented

[2] The number of chapter into bracket shows that the evaluation has been focused on a specific sub-domain of the standard in order to check specific and mandatory points.

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5.2.1.3.2 Summary of the Results per Security Criterium in GRTD

Table 15 gives an overview of the results per criterium according to a defined scale (included previously in the document):

Table 15 – Summary of criterium results

Criterium assessment results	Total/Type
Not rated	32
Well implemented	0
Appropriate	0
Satisfied	0
To improve	1
Partly satisfied	0
Not satisfied	0
Not tested	0
Not applicable	0
Out of scope	0
Total	33

Table 16 gives the details of the tests performed with their rating.

Table 16 – List of results per security criterium

Reference	Title	Rating
DTR23635_1.01.1	Principle 1: Define identifiers of entities involved.	To improve
DTR23635_1.02.2	Principle 2: Enable decentralized decision-making	Not rated
DTR23635_1.03.3	Principle 3: Ensure explicit accountability	Not rated
DTR23635_1.04.4	Principle 4: Support transparency and openness	Not rated
DTR23635_1.04.5	Principle 5: Align incentive mechanisms with system objectives	Not rated
DTR23635_1.04.6	Principle 6: Provide performance and scalability	Not rated
DTR23635_1.04.7	Principle 7: Make risk-based decisions and address compliance obligations	Not rated
DTR23635_1.04.8	Principle 8: Ensure security and privacy	Not rated
DTR23635_1.04.9	Principle 9: Consider interoperability requirements	Not rated
DTR23635_1.05.2	Comparison with other governance frameworks	Not rated
DTR23635_1.05.3	Specific governance considerations for DLT systems	Not rated
DTR23635_1.05.4	Decision rights and decision-making	Not rated
DTR23635_1.05.5	Accountability	Not rated
DTR23635_1.05.6	Incentives and incentive mechanisms	Not rated
DTR23635_1.06.1	Types of DLT systems	Not rated
DTR23635_1.06.2	Governance in permissioned systems	Not rated
DTR23635_1.06.3	Governance in permissionless public systems	Not rated
DTR23635_1.07.1	Governance throughout the DLT system lifecycle	Not rated
DTR23635_1.07.2	Governance in the establishment stage	Not rated
DTR23635_1.07.3	Governance in the operation stage	Not rated
DTR23635_1.07.4	Governance in the termination stage	Not rated
DTR23635_1.07.5	7.2.1 Overview of the DLT governance contexts	Not rated
DTR23635_1.07.6	7.2.2 Data context	Not rated
DTR23635_1.07.7	7.2.3 Protocol context	Not rated

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DTR23635_1.07.8	7.2.4 Application context	Not rated
DTR23635_1.07.9	7.2.5 Institutional context	Not rated
DTR23635_1.08.1	Role establishment and assignment	Not rated
DTR23635_1.09.1	Introduction	Not rated
DTR23635_1.09.2	On-ledger and off-ledger governance instruments	Not rated
DTR23635_1.09.3	Considerations in implementing instruments: 1 Adaptability	Not rated
DTR23635_1.09.4	...2 Risk	Not rated
DTR23635_1.09.5	...3 Privacy	Not rated
DTR23635_1.10.1	Governance of interoperability	Not rated

5.2.1.3.3 Summary of the Check Results per Criterion and Domain in GRTD

Table 17 gives an overview of the results per criterium according to a defined scale (included previously in the document):

Table 17 – Summary of checks results

Checks assessment results	Total/Type
OK (Checks satisfied)	**0**
NOK (Checks not satisfied)	0
OUT (Checks out of scope)	**166**
NAP (Checks not applicable)	0
Total	166

Table 18 provides an overview of the overall results of the checks carried out for each control.

Table 18 – Distribution of check results per criterium and domain

Reference	Title	OK	NOK	OUT	NAP	Rating
[2.1.4]	DTR23635_1.04 Governance principles for blockchain and DLT systems			19		Well implemented
DTR23635_1.01.1	Principle 1: Define identifiers of entities involved.			3		To improve
DTR23635_1.02.2	Principle 2: Enable decentralized decision-making			3		Not rated
DTR23635_1.03.3	Principle 3: Ensure explicit accountability			2		Not rated
DTR23635_1.04.4	Principle 4: Support transparency and openness			2		Not rated
DTR23635_1.04.5	Principle 5: Align incentive mechanisms with system objectives			1		Not rated
DTR23635_1.04.6	Principle 6: Provide performance and scalability			2		Not rated
DTR23635_1.04.7	Principle 7: Make risk-based decisions and address compliance obligations			2		Not rated
DTR23635_1.04.8	Principle 8: Ensure security and privacy			3		Not rated

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DTR23635_1.04.9	Principle 9: Consider interoperability requirements			1		Not rated
[2.1.5]	DTR23635_1.05 Governance framework for DLT systems			11		Well implemented
DTR23635_1.05.2	Comparison with other governance frameworks			1		Not rated
DTR23635_1.05.3	Specific governance considerations for DLT systems			1		Not rated
DTR23635_1.05.4	Decision rights and decision-making			1		Not rated
DTR23635_1.05.5	Accountability			4		Not rated
DTR23635_1.05.6	Incentives and incentive mechanisms			4		Not rated
[2.1.6]	DTR23635_1.06 Governance of different types of DLT systems			9		Well implemented
DTR23635_1.06.1	Types of DLT systems			4		Not rated
DTR23635_1.06.2	Governance in permissioned systems			2		Not rated
DTR23635_1.06.3	Governance in permissionless public systems			3		Not rated
[2.1.7]	DTR23635_1.07 Governance throughout the DLT system lifecycle and contexts			42		Well implemented
DTR23635_1.07.1	Governance throughout the DLT system lifecycle			3		Not rated
DTR23635_1.07.2	Governance in the establishment stage			15		Not rated
DTR23635_1.07.3	Governance in the operation stage			1		Not rated
DTR23635_1.07.4	Governance in the termination stage			2		Not rated
DTR23635_1.07.5	7.2.1 Overview of the DLT governance contexts			7		Not rated
DTR23635_1.07.6	7.2.2 Data context			6		Not rated
DTR23635_1.07.7	7.2.3 Protocol context			3		Not rated
DTR23635_1.07.8	7.2.4 Application context			3		Not rated
DTR23635_1.07.9	7.2.5 Institutional context			2		Not rated
[2.1.8]	DTR23635_1.08 Roles in the governance framework			6		Well implemented
DTR23635_1.08.1	Role establishment and assignment			6		Not rated
[2.1.9]	DTR23635_1.09 Governance instruments			72		Well implemented
DTR23635_1.09.1	Introduction			4		Not rated
DTR23635_1.09.2	On-ledger and off-ledger governance instruments			34		Not rated
DTR23635_1.09.3	Considerations in implementing instruments: 1 Adaptability			4		Not rated
DTR23635_1.09.4	...2 Risk			15		Not rated
DTR23635_1.09.5	...3 Privacy			15		Not rated
[2.1.10]	DTR23635_1.10 Governance of interoperability			7		Well implemented
DTR23635_1.10.1	Governance of interoperability			7		Not rated

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5.2.1.4 Section Outlook in GRTD

The governance review template has been given to the PUC for evaluation.

Once the ISO standard has been finalized and approved, the template shall be updated.

The review item and other elements should be improved based on the feedback of the first users.

The template can be given as a tool to anybody reviewing the governance of a DLT project.

5.3 Detailed review of GDPR requirements, etc.

In support of assessing the legal compliance, which is an essential element of a governance review, we have created review templates like the one for ISO 23635 for the following topics:

- GDPR
- NIS
- eIDAS (planned)
- …

In the following, we show the structure of review items related to GDPR. The document includes GDPR chapters such as General provisions, Principles, Rights of the data subject, Controller and processor, Transfers of personal data to third countries or international organisations, Remedies, liability and penalties, and Provisions relating to specific processing situations.

a. GDPR Chapter 1: General provisions
    i. Article 1: Subject matter and objectives
        a. rules relating to the protection of natural persons with regard to the processing of personal data and rules relating to the free movement of personal data
        b. this regulation protects fundamental rights and freedoms of natural persons and in particular their right to the protection of personal data
        c. free movement of personal data within the Union shall be neither restricted nor prohibited for reasons connected with the protection of natural persons with regard to the processing of personal data
b. GDPR Chapter 2: Principles
    i. Article 5: Principles relating to processing of personal data
        a. personal data shall be processed lawfully, fairly and in a transparent manner in relation to the data subject
        b. personal data is collected for specified, explicit and legitimate purposes and not further processed in a manner that is incompatible with those purposes

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c. personal data shall be adequate, relevant and limited to what is necessary in relation to the purposes for which they are processed
d. personal data may be destroyed or longer periods insofar as the personal data will be processed solely for archiving purposes in the public interest

ii. Article 6: Lawfulness of processing
   a. The article contains the conditions under which the processing of data is considered lawful
   b. The purpose of the processing shall be determined in that legal basis
iii. Article 7: Conditions for consent
   a. This article describes processing of data based on consent and what are the conditions
iv. Article 8: Conditions applicable to child's consent in relation to information society services
   a. The article provides information on processing data of a child
v. Article 9: Processing of special categories of personal data
   a. On processing data revealing racial or ethnic origin and political opinions and beliefs; genetic and biometric data
vi. Article 10: Processing of personal data relating to criminal convictions and offences
   a. Processing of personal data relating to criminal convictions and offences or related security measures
vii. Article 11: Processing which does not require identification

c. GDPR Chapter 3: Rights of the data subject
   1. Section 1: Transparency and modalities
      i. Article 12: Transparent information, communication, and modalities for the exercise of the rights of the data subject
   2. Section 2: Information and access to personal
      i. Article 13: Information to be provided where personal data are collected from the data subject
      ii. Article 14: Information to be provided where personal data have not been obtained from the data subject
      iii. Article 15: Right of access by the data subject
   3. Section 3: Rectification and erasure
      i. Article 16: Right to rectification
      ii. Article 17: Right to erasure ('right to be forgotten')
      iii. Right to erasure personal data concerning him or her without undue delay
      iv. Article 18: Right to restriction of processing
      v. Right to restriction of processing under certain conditions
      vi. Article 19: Notification obligation regarding rectification or erasure of personal data or restriction of processing
      vii. Article 20: Right to data portability
   4. Section 4: Right to object and automated individual decision-making)
      i. Article 21: Right to object
      ii. Article 22: Automated individual decision-making, including profiling
   5. Section 5: Restrictions
      i. Article 23: Restrictions

d. GDPR Chapter IV: Controller and processor
   1. Section 1: General obligations

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i. Article 24: Responsibility of the controller
ii. Article 25: Data protection by design and by default
iii. Article 26: Joint controllers
iv. Article 27: Representatives of controllers or processors not established in the Union
v. Article 28: Processor
vi. Article 29: Processing under the authority of the controller or processor
vii. Article 30: Records of processing activities
viii. Article 31: Cooperation with the supervisory authority

2. Section 2: Security of personal data
   i. Article 32: Security of processing
   ii. Article 33: Notification of a personal data breach to the supervisory authority
   iii. Article 34: Communication of a personal data breach to the data subject
3. Section 3: Data protection impact assessment and prior consultant
   i. Article 35: Data protection impact assessment
   ii. Article 36: Prior consultation
4. Section 4: Data protection officer
   i. Article 37: Designation of the data protection officer
   ii. Article 38: Position of the data protection officer
   iii. Article 39: Tasks of the data protection officer
5. Section 5: Codes of conduct and certification
   i. Article 40: Codes of conduct
   ii. Article 41: Monitoring of approved codes of conduct
   iii. Article 42: Certification

e. GDPR Chapter V: Transfers of personal data to third countries or international organisations
   1. Transfers of personal data to third countries or international organisations
      i. Article 44: General principle for transfers
      ii. Article 46: Transfers subject to appropriate safeguards
      iii. Article 47: Binding corporate rules
      iv. Article 48: Transfers or disclosures not authorised by Union law
      v. Article 49: Derogations for specific situations
f. GDPR Chapter VIII: Remedies, liability and penalties
   1. Remedies, liability and penalties
      i. Article 77: Right to lodge a complaint with a supervisory authority
      ii. Article 80: Representation of data subjects
      iii. Article 82: Right to compensation and liability
g. GDPR Chapter IX: Provisions relating to specific processing situations
   1. Provisions relating to specific processing situations
      i. Article 85: Processing and freedom of expression and information
      ii. Article 86: Processing and public access to official documents
      iii. Article 87: Processing of the national identification number
      iv. Article 88: Processing in the context of employment
      v. Article 89: Safeguards and derogations relating to processing for archiving purposes in the public interest, scientific or historical research purposes or statistical purposes.

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6 Overall Conclusions and Next Steps

In general, the document shows the current progress on all tasks related to exploitation, including an overview of innovation, a proposal for the governance of an envisaged entity evolving and exploiting the TOKEN BCPaaS. Besides its objective of showing a plan for exploitation and dissemination of the results of the TOKEN project, it presents key information from different TOKEN project activities to reach the sustainability goals.

TOKEN platform services have reached a level of maturity (still under progress) that is helping the project to have a closer reality check with TOKEN's Pioneer Use Cases (PUCs) and the TOKEN Policy Observatory discussions, which brings insights for both the business and governance models of TOKEN. It is, for example, essential to discover a balance between efficiency, privacy, and transparency while DLT technologies keep evolving continuously. After this deliverable, a fully-fleshed Business Model and Governance Model enriched by the advances on the next TOKEN Policy Observatory discussions and technical workstreams of TOKEN will be delivered.

For the **Business Model** we expect to get feedback from the new users with the Early Adopters Program and as well through the Onboarding process to help prospective users in their decision making to adopt DLT or not. **The Early Adopters Program** will take place up to the end of the project. We identified the targeted audiences as potential users of the TOKEN platform, and proposed how we could attract early adopters. We describe events organized (including social media activities) such as the launch of the TOKEN platform which had 74 attendees and 9 follow up requests to access the developer dashboard, international events, and planned demonstration that engages early adopters, full communication strategies are laid out extensively in D5.2 Communication Impact Report, but for the purposes of this deliverable the information provided in this deliverable is the one more closely related to actions that can support the exploitable products that are reaching maturity at this stage of the project. The Early adopters program has defined 3 main target audiences 1. ICT and Open Source

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Technology communities focusing on technology and infrastructures for the public sector; 2. CTOs, CIOs, Developers,ICT professionals working within Public Administration; 3. Policy Makers and Public Administration representatives willing to innovate services to citizens. Until the end of the project designated Business Development Representative will contact all telephone numbers directly and email addresses listed in the ecosystem mapping to accelerate the early adoption of the TOKEN technology and solutions. Moreover, the municipalities involved with the PUCs (Warsaw - Funding Distribution, Katerini - Accountability, Leuven - Postal Services, Santander - Data Valorisation) will be kindly asked to disseminate the best practices results in neighboring public administrations.

T**he Onboarding process** will be tested in the coming months and will certainly help prospects to decide if other alternatives such as Managed or Encrypted Databases would be a better fit to the problems that they need to solve instead of with Blockchain.

For the **Governance Model**, this document lays out the current state of the art on principles and tools for Governance on DLTs, to help us to govern DLTs. However, we are due to work closer in foreseeing what would be the consequences of such approaches for the partners and the project so that we can propose a consensual, effective, and sound approach. This will result from a next deliverable that will touch upon exclusively on Governance of the Platform. In connection with the Governance Model, the Business Model poses a decisive question that touches upon Principle 3 on Transparency: which is the legal entity that will implement this: Will there be interested parties in the General Assembly? Which interested parties will be named in the "Committee for Safeguarding Impartiality" In that way, the questions raised as well in the work of the Business Model have been considered in the initial proposal but are yet subject to discussion and implementation.

Although the project progressed more or less according to plans, it has to be noted that most elements of this work have been planned only from the second part of the project.

Here is a summary of a few key future steps

1. Finalize the exploitation plan and business models based on first users feedback (other than PUCs) via an onboarding process and the follow up on KPIs of PUCs
2. Sustainability strategy crafted with a financial model feeding on the KPIs and data collected from end users
3. Follow up on setting up an early adopters strategy in line with the marketing channels and customer journey so that the interested adopters can be smoothly engaged.
4. Assist the PUCs municipalities in promoting their best practice to neighbouring public administration and fasten the dissemination of results
5. Discuss more in depth with the partners the implications of the suggested methods and governance models that were presented in this deliverable so as to come to a consensuated model

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6. Provide a space for the PUCs to see how an eventual proposed governance model is suitable for their needs and incorporate this feedback for conclusion 3. Apply the governance in the PUC
7. Update Governance based once ISO 23635 once issued
8. Decide and implement the BCPaaS Owner legal structure, and implement the governance within this organisation
9. Continue dissemination.

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