The need to involve citizens in the whole administration process has gained more and more relevance in European cities and regions, as shown by the diffusion of the collaborative approach in governance and policy making. The paradigm of **collaboration** is integrating that of **participation** and putting the **partnership between citizens and public administrations at the core of the European Digital agenda**. This partnership has been prevalent in the provision of public services, sometimes referred to as co-production, co-management, or co-delivery, where non-governmental actors such as Third Sector Organizations carry out activities on behalf of the local administration. Some example of this are associations that work in the social care domain, organizations of citizens that contribute to the management of public goods, private citizens that come together and organize the cleaning of river banks or mountain trails.

While these initiatives promise to limit cost and foster a positive change in the relation between citizens and government, they all suffer from one breaking limitation: **sustainability**. **Sustainable citizen participation** is difficult to achieve. This is true especially for voluntary initiatives where the behavioural change required for a long-term commitment to co-production is hard to attain without some form of rewarding system. Even when there is a material reward, like in paid services, **financial sustainability** is a critical issue. More and more, public administrations at different levels are constrained by the need to reduce public spending and contain public debt and deficit, thus reducing the number and scope of co-produced and co-managed initiatives.

To counter this development, governments have recently explored two major ways to solve the sustainability issue: **Digital Community Currency** (DCC) and **social public procurement** (SPP).

A DCC is an exchange system that functions as a supplement to regular money. DCCs are used in networks limited by geography, sector, or shared values and are issued and managed in not-for-profit manner. Over the last decade, the number of Local Authorities (LA) and Municipalities that have played a lead role in the design of implementation of Community Currencies has grown significantly. For example, the Community Currencies in Action (CCIA) project, an INTERREG project aiming to lay the ground for cross-sectorial currency innovations designed for the common good, lists more than 30 Community Currencies active in the EU. However, DCCs are severely constrained by heavy adoption and operation costs and by their local dimension, meaning they are available and circulate only in a limited area.

SPP refers to the purchase of a range of goods and services by public authorities from private companies or social and non-profit enterprises, with the aim of creating direct and indirect social value. The attempt of Public Administrations (**PAs**) to re-engineer their procurement schemes in an "enlarged" outcome-based direction able to provide more customized services through a deeper understanding of users' needs; the emergence of **social impact financial instruments, such as Social Impact Bonds (SIB);** and the willingness of foundations with roots in banking to evolve their delivery models, are all elements that **increase the need to make the generated social value explicit in a quantitative sense**. Consequently, SPP aims to increase a PA's **financial and social sustainability by reducing public spending** for the provision of public services and by **directing resources towards identified social needs and social impacts**. However, despite its benefits, the existing SPP process brings with itself several problems, such as the high cost of management and the lack of transparency. Setting up and managing SIBs is a complex and time-consuming process with high administrative costs.

To address these issues, DLT4PUBLICGOOD will provide an **innovative infrastructure, unifying the technical and financial dimensions**. The infrastructure will be based on Artificial Intelligence (AI) and Blockchain technologies to support the work of PAs, associations, and private citizens in the co-production of public services. By doing so, it will facilitate the partnership between government and citizens. Moreover, it will ensure accountability and trust.

In fact, Blockchain has already been proposed[1] in recent years as a means to surpass the current limitations of both DCC and SPP. Firstly, it can **overcome the limitations of DCCs** by creating a global payment community – used by people worldwide instead of a geographically limited community. Secondly, in combination with AI, it can **overcome the limitations of SPPs** by providing an administrator-free process to measure the performance of social impact at every step of the process, thereby enhancing transparency and distribution. We believe that the potential of this technology has not yet been fully exploited and that the proposed unified infrastructure to support PAs both in running SPPs schemes and in co-partnering DCCs can become a disruptive innovation in that it radically changes the way PAs and citizens think and operate in this area.

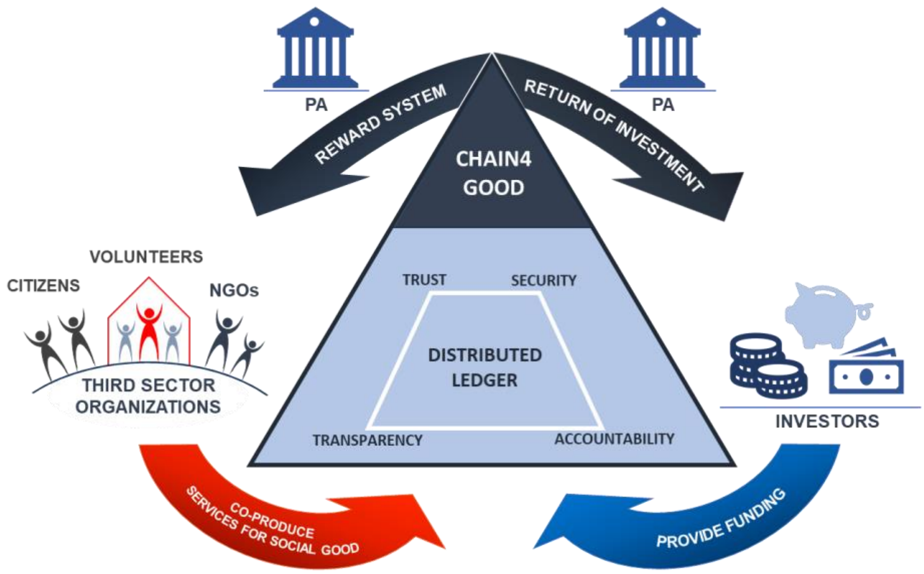

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Figure 1: DLT4PUBLICGOOD concept at a glance

For this unified infrastructure to work it needs to answer the needs of all the stakeholders involved:

- **PAs** need it to track and set a value for sustainable initiatives and services, and to facilitate financing schemes with low administration and management costs.
- **Investors** need it to have clear conditions for the ROI (return of investment) and to allow measuring the performance of the initiatives tied to their investment at every step of the process.

1 http://panimpact.kr/first_smart_sib/

- **Third Sector Organizations (TSOs)** need it to support a rewarding system for their volunteers and to provide a free certification service to draw and validate the organization's social responsibility record.
- Finally, **all stakeholders** need the infrastructure to be trusted, transparent, secure, and the accountability of all transactions guaranteed.

1.1.1 Project objective

DLT4PUBLICGOOD's goal is to evaluate the disruptive impact, on both Public Administration and society, of AI and Blockchain and virtual currencies as a game changing technology to manage, assess and co-finance sustainable impact initiatives and services.

The project aims can be broken down into the following smaller project objectives.

PO1. To create a financial architecture with innovative business models to evolve the concept of social public procurement to facilitate its adoption by PAs and its appeal to investors.

- Blockchain-enabled SIBs, where social balance filled by the distributed ledger and AI-based evaluation of effectiveness of actions are used by the PA to verify the achievement of the social impact, and by the investors to evaluate the investment risk.
- Virtual currency issued by the P.A. (for example based on Initial coin offers) and made available to investors. Virtual currency will be then used as a DCC to compensate services by non-governmental organizations (NGOs), citizens and volunteers.

PO2. To provide Third Sector Organizations with a rewarding mechanism for their volunteers and with a free certification service to validate their social responsibility record.

- To give a value, in DCCs, to services provided by volunteers so that they can use the currency to get community benefits and services from the P.A. or from involved companies.
- To create an analytics framework that utilizes Blockchain as an aggregated big data service that collects transaction data and other uses data sources to provide the figures necessary for the social responsibility record.

PO3. To create a technical architecture based on AI and Blockchain technologies that allow a public, verifiable, transparent, and privacy-preserving tracking of the activities performed by associations, volunteers, and citizens pertaining to their co-managed services.

- To create a Blockchain-based middleware for registering, tracking, managing, and accessing the information about social-impact related actions operated by the associations. This middleware will provide a set of components that allow registering and tracking the actions using the Smart Contracts built on top of the underlying ledger.
- To co-design and implement a dashboard for government agencies and investors where AI is used to quantify social impact, and a wallet for citizens and volunteers that allows them to access a marketplace for community benefits and services.

PO4. To deliver the DLT4PUBLICGOOD Platform, an open software system that can interoperate with PA legacy systems.

- A platform that **combines consolidated e-government methodologies with innovative Blockchain technologies** and support disruptive business models, enabling their experimentation in more or less controlled operational settings.

- An interoperability platform that enables an **agile adoption of DLT4PUBLICGOOD solution and its connection with** PA legacy systems and that allows, when needed, the exploitation of data and services from these systems.

PO5. To evaluate and assess the impact of the DLT4PUBLICGOOD solution.

- To customise, deploy, operate, and evaluate the DLT4PUBLICGOOD solution on **two pilots in major EU cities**.
- **To assess the impact** of the proposed solution in terms of measures such as **increase in the number of volunteers, efficiency of and effectiveness of co-produced services, or increase in collection of funding from investors.**

Overall Approach

The Overall aim is that by introducing a technical and financial infrastructure based on Blockchain, we can lower the barriers for the adoption of social public procurement and Digital Community Currency and make them viable sustainability mechanisms to co-produce services for social good. The three-key concept of this statements are **Blockchain technologies**, **Social public procurement** (and in particular Social Impact Bonds) and **Digital Community Currency**. We will briefly introduce these key concepts.

Social impact bonds

A Social Impact Bond is a contract with the public sector, whereby it pays for better social outcomes in certain areas and gives part of the savings achieved to the investors. Usually, governments decide what problems they want to address and then enter a contractual agreement with an intermediary (or bond-issuing organization) that is responsible for raising capital from independent investors, including banks, foundations and individuals, and for hiring and managing non-profit service providers. If the project achieves its stated objectives, the government repays the investors with returns based on the savings the government accrues as a result of the program's success. A Social Impact Bond is not a bond per se, since repayment and return on investment are contingent upon the achievement of desired social outcomes; if the objectives are not achieved, investors receive neither a return nor a repayment of principal. SIBs derive their name from the fact that their investors are typically those who are interested in not just the financial return on their investment, but also in its social impact.

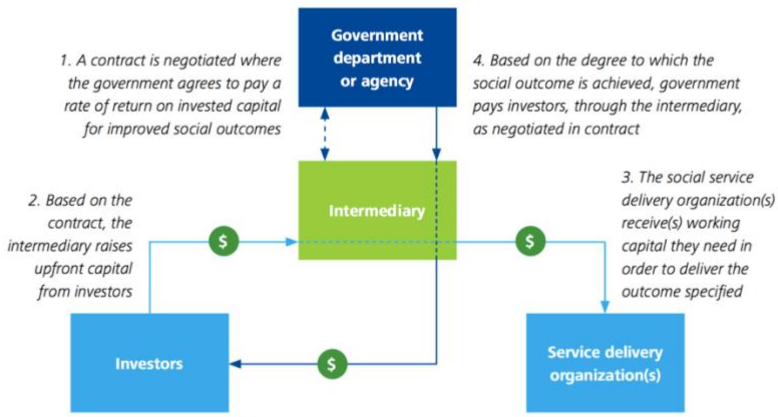


Figure 2: Social Impact Bonds process

The first Social Impact Bond was issued, in the UK, in 2010 by Social Finance Ltd. Since then, SIB has been launched in 22 countries and has raised approximately $400M in investment for social projects. The trend of investing in societal challenges has risen in recent years and has become a way for investors to give back to the community, as well as a way for companies to expand their social responsibility.

Community currency

Community Currencies or Complementary Currencies (both abbreviated CC) are currencies that have different designs and serve different purposes than conventional money. They exist as a supplement to our conventional (national) money. "A complementary currency (…) is an agreement to use something else than legal tender (i.e. national money) as a medium of exchange, with the purpose to link unmet needs with otherwise unused resources" **Error! Reference source not found.**. Community currencies are distinct from other types of complementary currencies in two main ways:

- the explicit aim to support and build more equal, connected and sustainable societies;
- they are designed to be used by a specific group.

Often devised in response to the shortcomings of the monetary system – for example, the lack of credit available for small businesses, or funding cuts to public services – Community Currency projects set out in different ways to link up the spare capacity of some of their members with the unmet needs of others.

Often starting from an idea of the positive impact a project would ideally have, well-designed currencies can address a wide number of different aims, such as (i) democratising services and organisations, (ii) supporting the SME economy; (iii) countering inequality and social exclusion, and (iv) addressing environmental impacts.

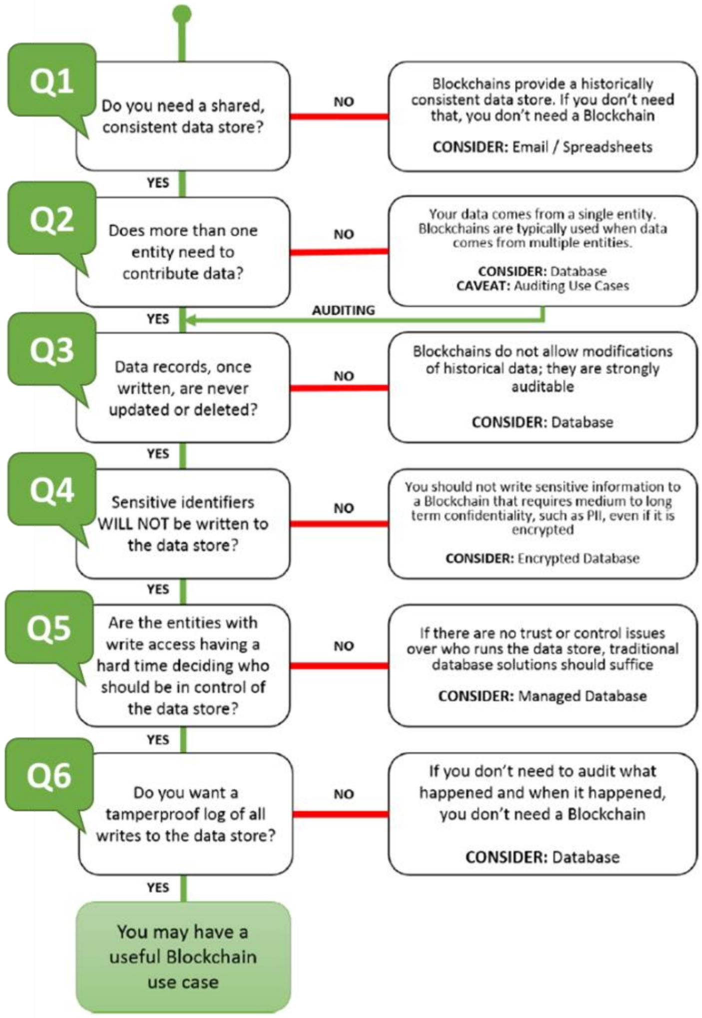
DCC is one of the main trends in the field of Community Currencies: in the same way in which traditional payments are increasingly becoming digital, nowadays the great majority of Community Currencies are based on digital means like cell phone apps, plastic cards, the Blockchain, and even web sites. In fact, Blockchain has been explored for Community Currencies: actually, Blockchain and Community Currencies have a lot in common. If centralized currencies serve centralized production, regional currencies represent a democratization of currencies, supporting local businesses and educating consumers about how their money circulates in the local economy. There are several example of Blockchain-powered Community Currency, like Hull-coin (http://www.hull-coin.org/), involveMINt (https://www.involvemint.io/) and other cases as reported in (https://b.3cdn.net/nefoundation/ff0740cad32550d916_o1m6byac6.pdf).

Blockchain

A Blockchain is *"a time-stamped series of immutable record of data that is managed by cluster of computers not owned by any single entity. Each of these blocks of data (whence "block") are secured and bound to each other using cryptographic principles (whence "chain")."*

Within the context of this proposal, when we use the term *"Distributed Ledger"* we mean a distributed ledger that employs Blockchain and we use *"Distributed Ledger Technology (DLT)"* as a synonym of Blockchain technology.

A Blockchain network has 4 key characteristics:



- **Consensus:** for a transaction to be accepted and recorded on the Blockchain, all the participants must agree to follow the same rules. This is the consensus. If a transaction violates one of the rules the network agreed on, the transaction will be considered invalid. The consensus allows each participant to trust the network, because they know each transaction will follow rules they ratified when the network launched.
- **Provenance & Traceability:** participants know where the assets came from and how its ownership has changed over time. Each asset's (whatever it is, tangible, intangible, digital) provenance must be traceable. If we have a Blockchain designed to track a fish's journey from the sea to a restaurant, I must be able to know where it was caught, by who, and when. I also must be able to know how many middlemen were involved during the fish's journey. All the way to the moment the restaurant bought my fish.
- **Immutability:** no participant can modify a transaction after it has been recorded on the ledger. Doesn't matter who you are, you just do not have the power to do that. If an error occurs, a new transaction must be used to reverse the error. At that point, both transactions will be visible on the ledger. The first transaction, considered an error, will always be visible once it is recorded.
- **Finality:** in a Blockchain network, there is a single source of truth. There is only one ledger, with multiple copies, for the whole network. To know who owns what, or to study a particular transaction, there is only one place to go.

Given the hype around Blockchain technology, the fear of missing out is quite high and most organizations approach the problem as "we want to use Blockchain somewhere, where can we do that?", which leads to frustrations with the technology as it cannot be applied universally. **Error! Reference source not found.** shows a flowchart published by United States

Department of Homeland Security (DHS) Science & Technology Directorate to help determine whether a Blockchain may be needed for a development initiative. This flowchart was used in the ideation of DLT4PUBLICGOOD and analysed together with partner public administration: with this we determined the suitability of Blockchain for our case.

AI-based social-impact measurement

DLT4PUBLICGOOD's impact measurement brings together AI-driven and more traditional social science methodologies for the very first time. In particular, innovative AI approaches and novel sources of data will be used (i) to draw **indicators on which to identify the right beneficiaries of the social programmes** designed by voluntary organizations and social enterprises (starting from the work in **Error! Reference source not found.**) and (ii) to **measure the evolution over time of these indicators** for the beneficiaries of the social programmes, so to **evaluate the social impac**t of the program. Doing so, our methodology will help to more accurately **foresee and estimate the values of instruments like SIBs**.

AI-driven algorithms and impact metrics will be discussed with the project's key stakeholder groups. Hence, following a co-creation approach involving the key stakeholders the impact measurement methodology consists of four phases

1. Preliminary Analysis: analyse the state of the art regarding more traditional impact measurement methodologies and AI-driven approaches (e.g. fair and transparent machine learning algorithms for the identification of the beneficiaries and causal machine learning models for the evaluation of the social programmes' impacts).
2. Context Analysis: analyse of the pilots' intervention models and environments, including existing measurements and conduct a mapping of local stakeholders, and analyse and prioritise them.
3. Measurement model development: co-define an innovative targeting and measurement methodology with a focus on **fair, transparent, and causal machine learning models**.
4. Measurement: we collect several sources of data from Pilots, analyse them, interpret them together with the key stakeholders, and communicate the results to the target audience.

We will evaluate each employed technology with respect to its particular aspects that require special attention from the impact measurement perspective: e.g., monetisation or power imbalances when negotiating impacts in connection with **SIBs**; smart contracts or the immutability of the **blockchain** when preconditions change; transparency and fairness of **AI-based** decisions; trust in these disruptive technologies.

The key stakeholders are of prime interest to the impact measurement. Their early involvement provided, their needs and interests must be understood and taken into account, their co-ownership of the process will be instrumental in the success of the co-creation approach

1.1.2 DLT4PUBLICGOOD logical architecture

Figure 3 describes the logical architecture of the DLT4PUBLICGOOD solution.

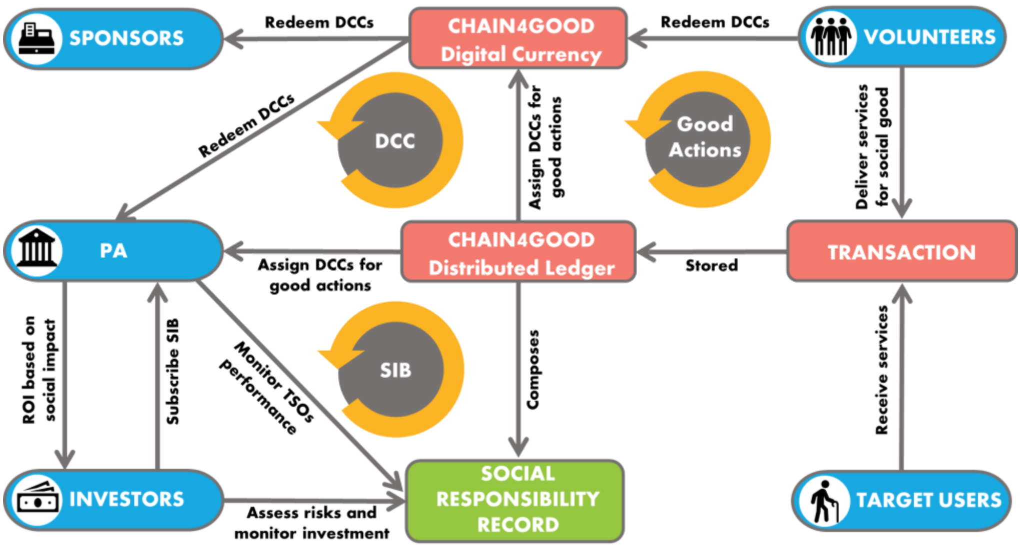


Figure 3: DLT4PUBLICGOOD logical architecture

At its core, DLT4PUBLICGOOD will provide an architecture to allow tracking and the storage of records of **good actions** carried out by citizens or volunteers of TSOs. This is represented in Figure 3 by the "Transaction" between volunteers and their target users and the "DLT4PUBLICGOOD Distributed Ledger" where information about each action is stored. This transaction mechanism must be secure and auditable removing the possibility to make false claims of services, should be privacy-preserving given the sensitive nature of stored data, and should be usable also in contexts where the target user is a person with disabilities, or totally unfamiliar with the technology. We are aware that this is a fine trade-off and that the usability of the tracking solution for good actions is one the most critical points for the adoption of DLT4PUBLICGOOD: instead of looking at a one-fits-all solution we are evaluating the best options for each service (e.g.: in some cases a thumbprint scan of the target user may be possible, in others tracking the volunteers location may be enough). Special care will be taken for those services targeted at users unable to give consent.

The adoption of Blockchain as the underlying technology for the implementation of the repository of the transactions of good actions is done on the basis that: first, it is a **shared repository**, with data contributed from **many sources** (different NGOs/TSOs), potentially **distributed** across PA boundaries; distributed, **consensus-based** control will, in our opinion, facilitate the adoption of the project solution (see **Q1**, **Q2** and **Q5** of **Error! Reference source not found.**). Also stored transactions need to be **traceable** and **immutable**, to support the audit and decision processes that will be built on top of these transactions (see **Q1**, **Q3** and **Q6** of **Error! Reference source not found.**).

In the upper left part of Figure 3, we see the **DCC process**: (i) the PAs assess the impact of sustainable initiatives and services and **give a DCC value to good actions**; (ii) all good actions are tracked within DLT4PUBLICGOOD Distributed Ledger, so that DCC will be automatically **earned by volunteers and private citizens** carrying them out; (iii) volunteers and citizens will then be able to **redeem DCC** from the PA itself (for example as tax discounts) or from sponsor companies (for example, by getting discounts on products and services).

In the lower part of the Figure we see the **SPP process**, instanced on **SIBs**. The difference with respect to a traditional SIB scheme is captured by the **DLT4PUBLICGOOD Social Responsibility Record,** which is composed by the good actions tracked in the DLT4PUBLICGOOD Distributed Ledger to measure the performance of TSOs (and indirectly of PAs), both in the current sustainable initiative and in past ones. This core concept of DLT4PUBLICGOOD instruments different phases of the SPP process. Investors can assess the social responsibility record of the TSOs that will be involved in the activities and **make an informed decision** on whether to subscribe the SIB; through the record, PA and Investors can **monitor the status of the activities** tracked in the DLT4PUBLICGOOD Distributed Ledger; the social responsibility is used to **verify quantitatively the achievement of the social outcome** – and hence the conditions of the payments associated to the bonds – so that there is no need of external independent parties.

Blockchain are widely adopted as enablers for DCC. While there is only one example in the world of Blockchain-enabled SIB, the benefit of using Blockchain are inherent in its characteristics:

- **Consensus:** the SIB information added to the Blockchain has to be validated by consensus. All the parties involved have to be agreed collectively to support a decision rather than by a single central administrator (see **Q5** of **Error! Reference source not found.**).
- **Traceability:** since Blockchain maintains the time-stamped records of every transaction, it can enable easy tracing at any time. The Blockchain platform gives provides traceability which will prevent fraud or data manipulation (see **Q3** and **Q6** of **Error! Reference source not found.**).
- **Quick access:** since Smart Contracts can automate the process and eliminate the need for a central authority, investment and calculation of the interest and the impact could be made faster and quicker.
- **Reduced transaction costs:** since there is no middleman involved to evaluate the impact on the Blockchain, the business costs get reduced over time.

1.1.3 DLT4PUBLICGOOD's technical architecture

DLT4PUBLICGOOD will provide an IT platform based on the disruptive Blockchain technology. Figure 4 below shows the proposed high-level architecture depicted as a layered architecture pattern, otherwise known as n-tier architecture pattern. The identified components are organized into horizontal layers, each layer playing its own role in order to provide a complex and full service through the management and orchestration of different micro services.

Three main layers have been identified:

- <u>The Presentation Layer</u> consists of the apps that provide the user interfaces to exploit the services available on the platform. In DLT4PUBLICGOOD project, two main apps will be implemented: (i) the first is the **DLT4PUBLICGOOD Dashboard**, a web app that provides access to the DLT4PUBLICGOOD Social Responsibility Record through a generic browser. Its users are the PAs and the Investors, which will use the platform services in order to manage the different phases of the SIB process (e.g. evaluate the investment, monitor the performance, assess the achievement of SPP initiatives); DLT4PUBLICGOOD Dashboard also allows PAs to manage the DLT4PUBLICGOOD Digital Currency (e.g. exchange rate of good actions and currency) and the marketplace of services and products to be used to redeem the currency; (ii) the second is an app for mobile devices (smartphones and tablets). In this case, users are the citizens and volunteers, which use their personal devices to feed the platform with their good actions (**DLT4PUBLICGOOD Tracking App**) and to spend the virtual credits acquired as reward, buying products and services (**DLT4PUBLICGOOD Wallet**).

- The Service Layer consists of the backend services, which will implement the business logics defined to fulfil the business requirements pointed out during the project business analysis. Five main components building the Service Layer are: (i) a **Data Analysis Service**, to provide accurate reports about the social balance corresponding to associations delivering the public financed services; (ii) a **Marketplace Service** for the management of products and services provided by PAs and sponsors; (iii) a **Smart Contract Service**, responsible of how formalize supply and financing agreements between the users of the platform; in other words, the Smart Contract Service translates the agreements between the parties (i.e. exchanges of values) into a smart contract to insert in Blockchain; (iv) an **Identity Service**, to provide a single point of integration for managing authentication, authorization, and a catalogue of services. The Identity service is typically the first service a user interacts with: once authenticated, the user through his/her identity may access other DLT4PUBLICGOOD platform's services; likewise, other services leverage the Identity Service and to discover where other services are within the deployment; (v) finally, a **Data Ingestion Service** will be responsible of the processes of importing, transferring, processing and loading data coming from other component for later storage in the Blockchain.
- The Infrastructure Layer consists of the Data Storage System and the Data Access Layer. In the DLT4PUBLICGOOD project, the main component is the **Blockchain** technology. It provides an immutable and tamperproof repository where to get trace of the state of all assets of the platform, such as the digitalized **good actions**, **smart contracts** and the **cryptocurrency** used for the reward process. An exception to the standard interpretation of this layer is the presence of the smart contracts, which allow performing computational operations in synergy with the backend modules contained in the overlying layer. In the Infrastructure Layer, other components will be at support of the business processes as SQL, NoSQL databases.

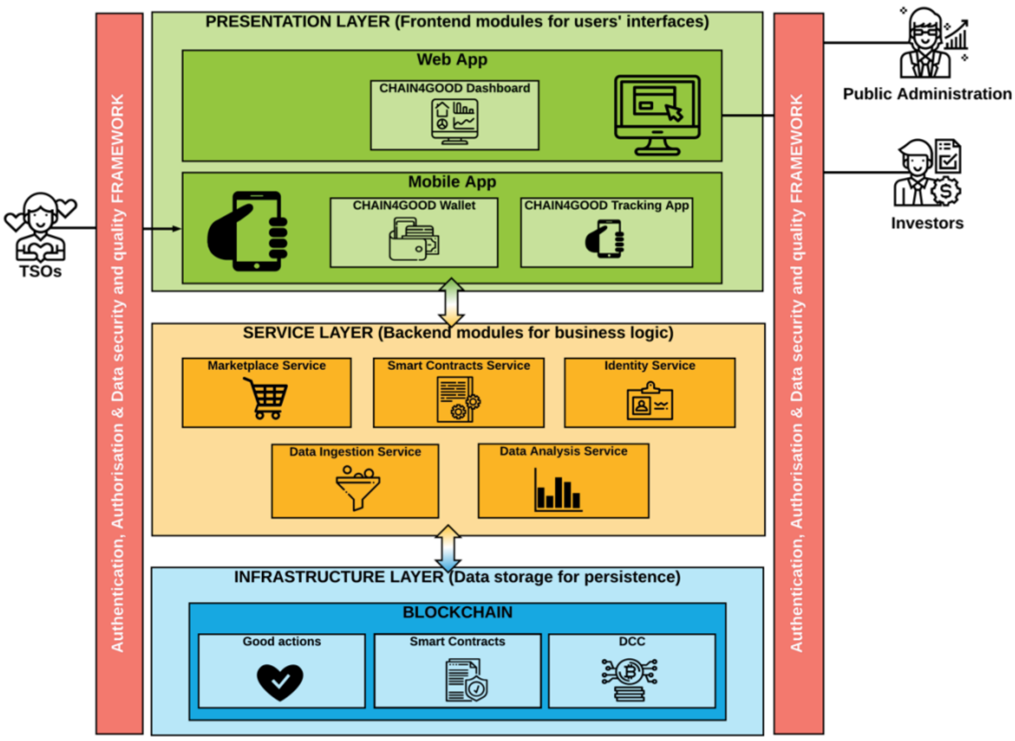


Figure 4: DLT4PUBLICGOOD solution - conceptual architecture and main components.

1.1.3.1 Data management and Security

Data Management incorporates a group of activities relating to the planning, development, implementation and administration of systems for the acquisition, storage, security, retrieval, dissemination, archiving and disposal of data..

Data Storage and Persistence will be managed in the Infrastructure Layer of the DLT4PUBLICGOOD Platform. The project databases include data collected from all the different entities participating in transactions, namely Public Authority, Investors, Charities, NGOs and Citizens. This project will use Blockchain as a transactional layer: the distributed ledger paradigm of Blockchain helps to manage data coming from different heterogeneous actors (see **Q1** and **Q5** of **Error! Reference source not found.**). Due to the transactional nature of Blockchain, it is however not adequate for all databases: for instance, it cannot be efficiently used to store historical data. For this reason, the Data Management strategy in DLT4PUBLICGOOD will adopt a broader strategy, which will be built following the principles highlighted by the Good Data Platform[2] and, in line with this the project, will implement the following:

- Define a **data model**, including information describing the data and the associated meta-information (expiration date, status, data source). Options such as an LDAP directory for implementing the data repository will be evaluated prior to implementation.
- **Access control**. Develop appropriate access control protocols and rules complementing functionality coming from Blockchain frameworks capabilities. This will include valid identifiers, ideally attributes facilitating the appropriate profiling.
- **Authentication**. Develop Single-Sign-On (SSO) along with consideration of the means of authentication to be supplied to users, depending on the criticality of the services being accessed: the level of reliability of the authentication (i.e. password, OTP, certificate) may then constitute identity information.

System Security is a key point for the development and implementation of a distributed and open IT platform. Security is essential at various levels of the system, which is why we considered appropriate to represent aspects such as identification, authentication, authorization, confidentiality, integrity and non-repudiation in a single security framework that is transversal to all three levels (see Figure 4).

Blockchain provides a degree of security 'out-of-the-box' through its distributed architecture with consensus-based data insertion, built-in encryption, transparency, and administrator risk controls provided directly by the hosting Cloud environments. In this way, the Blockchain infrastructure is resistant to the malicious data modification by design, avoid a single point of failure, and enables the possibility to engage wide range of compliance checking and audit mechanisms necessary to identify timely and clearly possible treats and vulnerabilities. **These features are intrinsic to Blockchain and to an extent facilitate the notion of 'security-by-design'**.

Taking into account that Blockchain will only be the transactional layer facilitating smart contracts, data sharing and analytics, it is important that the data at source (databases where it resides) is also secure at rest. At the database layer the data will be encrypted utilising an

2 https://help.gooddata.com/display/doc/Building+on+GoodData+Platform

approach like Transparent Data Encryption (TDE) which enables one to encrypt sensitive data that are stored in tables and tablespaces. This sort of approach will, on the one hand, guarantee that the data encryption is transparent to the database users and applications and, on the other hand, will efficiently store, convert, and transform the sensitive data in an encrypted form.

We remark that the **need to store sensitive data** is one of the reasons for discarding Blockchain technology for the transaction layer (see **Q4** of **Error! Reference source not found.**). The approach based on TDE just described overcomes the privacy issues relating to sensitive data thereby making it possible to **store personal and sensitive data in a secure and privacy-preserving way**: this, in our opinion, fulfils the requirement of **Q4** for the adoption of Blockchain technology.

At the analytics layer the project will use Homomorphic encryption. Using homomorphic encryption will allow transmission of private data that can still be manipulated by a third party. Some cryptographic techniques like Zero Knowledge Proofs (ZKs), which are already used in Blockchains, are already implementing a form of homomorphic encryption. Examples of how this technology is empowering the citizen are various, such as the work undertaken within the United Arab Emirates led by IBM[3], the work carried out by the UK Government on the use of blockchain for the public good[4] and the work by initiatives like ID2020[5] in partnership with UNHCR is just another. Privacy of citizen data is an increasing concern and the use of blockchain will limit the exposure of personal information whilst allowing to citizen to release that same data to others when doing so is of benefit to them. The work done by MIT Media lab in 2018[6] shows exactly how this works where privacy is decentralised and supported by an infrastructure that inherently and intrinsically supports the need to keep data secure.

1.1.4 DLT4PUBLICGOOD legal framework review

All privacy and data protection issues within the scope of the project will be covered by the relevant EU legislation, including Regulation (EU) 2016/679 of the European Parliament and of the Council of 27 April 2016 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data, and repealing Directive 95/46/EC (GDPR), as well as Directive 2002/58/EC of the European Parliament and of the Council of 12 July 2002 concerning the processing of personal data and the protection of privacy in the electronic communications sector (Directive on privacy and electronic communications – ePrivacy Directive). The provisions of the GDPR, more specifically, will be applied anytime personal data in the context of the project activities is being processed within the meaning of Art.4 GDPR, it will ensure that the appropriate safeguards for lawful processing (Art.6 GDPR) are complied with and the rights of the data subjects are not violated. As the successful application of the DLT4PUBLICGOOD Platform is heavily based on **Blockchain technology** and **Smart Contracts**, a **critical evaluation on its compatibility with the applicable legislation currently in force** on electronic identification in the European Union, namely Regulation (EU) No 910/2014 of the European Parliament and of the Council of 23 July 2014 on electronic identification and trust services for electronic transactions in the internal market and repealing Directive 1999/93/EC (eIDAS Regulation), will be performed.

3 https://www.ibm.com/blogs/blockchain/2018/10/how-the-uae-is-empowering-its-citizens-through-blockchain/
4 http://chrisholmes.co.uk/wp-content/uploads/2018/10/DLT-for-Public-Good-Progress-Update-October-2018.pdf
5 https://id2020.org/
6 https://enigma.co/ZNP15.pdf

Resolutions, recommendations and opinions will also be taken into account, such as the Opinion of the European Economic and Social Committee on ‘Blockchain and distributed ledger technology as an ideal infrastructure for the social economy (2019/C 353/01).
The legal framework of the project will also include any **legal challenges that may potentially arise with the adoption of Blockchain technology, Smart Contracts and Digital Currencies** (more precisely, the Community Digital Currency). It will also consider all legal implications within the area of Social Public Procurement (SPP), as well as Social Impact Bonds (SIB), including relevant existing legislation, such as Directive 2014/24/EU of the European Parliament and of the Council of 26 February 2014 on public procurement and repealing Directive 2004/18/EC, Directive (EU) 2019/882 of the European Parliament and Council of 17 April 2019 on the accessibility requirements for products and services, and also Directive (EU) 2019/1024 of the European Parliament and of the Council of 20 June 2019 on open data and the re-use of public sector information (recast).
Since the DLT4PUBLICGOOD Platform includes the dynamic and constantly evolving subject of **Artificial Intelligence**, **the area will also be scrutinized within the legal framework** of the project, taking into consideration the European Commission’s White Paper On Artificial Intelligence - A European approach to excellence and trust, as well as its Report on the safety and liability implications of Artificial Intelligence, the Internet of Things and robotics.