Dutch Blockchain Coalition

connect and create

Blockchain for Good

The vision and mission of the Dutch Blockchain Coalition

Introduction

Blockchain technology can be used to build more sustainable, secure and reliable digital infrastructure. This technology is therefore potentially revolutionary. However, as Blockchain technology is also very complex and is still in its infancy that potential can only be realised through open collaboration. With open collaboration the knowledge needed to deal with the complexity can be consolidated and such openness will also facilitate the new decentralised forms of governance that the Blockchain requires.
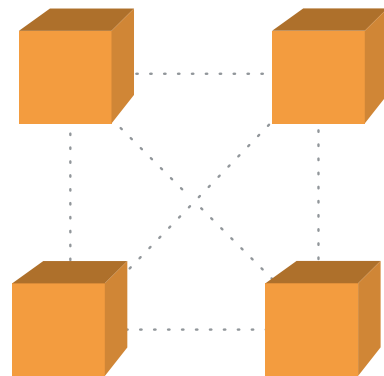
Therefore Blockchain cannot be developed within the walls of a single organisation. So in March 2017, representatives from the public, private and knowledge sectors took the initiative to establish the Dutch Blockchain Coalition, DBC. The Top Team ICT of the Ministry of Economic Affairs and Climate Policy recognised the urgency of this initiative and facilitated the process of establishing the coalition. DBC achieved many successes in its first year and so it is hardly surprising that the Dutch government specifically mentioned DBC in its **digitalisation strategy:** 'If we want to make optimal use of the opportunities provided by digitalisation and counteract its negative consequences, then intensive collaboration is required. A good example of this is the establishment of the Dutch Blockchain Coalition'.

This mission is urgent. Worldwide Blockchains for Money (financial gain, private property) and Blockchains for Control (collection of data, state control) are growing rapidly but Blockchains for Good (public interest, collective ownership) are lagging.

In this vision document, we review important Blockchain developments from recent years and subsequently establish what the exact societal and economic importance of Blockchain is and how DBC can make a tangible contribution to that in the coming years.

Major opportunities lie ahead of us: over the past year, the collaboration from the public, private and knowledge sectors (Triple Helix) in DBC has already demonstrated its uniqueness in the world. However, given the rapid developments in Blockchain, a substantial acceleration and investment are now needed to maintain and consolidate the leading position of the Netherlands. This needs to be realised in collaboration with various Blockchain Fieldlabs and partners such as Startup Delta, Brightlands, Amsterdam Economic Board, Blockchaingers, Blockchainpilots and Yes!Delft.

The mission of the Dutch Blockchain Coalition is to realise fully reliable and socially accepted Blockchain applications, to create the best possible conditions to allow Blockchain applications to arise, and to facilitate the use of Blockchain as a source of trust, well-being, prosperity and security for citizens, companies, institutions and government bodies. The Dutch Blockchain Coalition mainly acts as a catalyst and facilitator in this process and activates its large public-private network for this purpose.

Ten years of Blockchain technology

Since the invention of the Internet our digital infrastructure has been based on centralised servers that users entrust data and transactions to. Whoever wants to make use of online services must trust a third party (such as Facebook, Google, or the bank) to safeguard data security and privacy. In 2008, a counterargument arose to this centralised, digital infrastructure in the form of an online paper. This presents a technology in which another model was introduced that caused a paradigm shift: Bitcoin. In this famous white paper from the still unknown Satoshi Nakamoto, an initial version of Blockchain technology was presented. Blockchain technology now makes it possible to manage data with complete security but without the need for a central authority and so without a central server. Critical comments need to be placed in the case of Bitcoin; speculation leads to large exchange rate fluctuations, the consensus mechanism requires an astronomical consumption of energy and the pseudo-anonymity is a commercial motive for illegal practices on the dark web and black market. Ultimately Bitcoin is therefore a proof-of-concept for Blockchain technology, which also demonstrates that many challenges remain if genuinely successful large-scale Blockchain applications are to be developed.

However, Bitcoin is just one of the many applications of Blockchain technology. In the initial years of the Blockchain hype, numerous ideas arose on web fora and at international Blockchain conferences about an entirely new, democratic, Internet based on Blockchain and therefore without intermediaries, the so-called third parties. Anywhere where third parties did not deal with data transparently and abused power, Blockchain could provide the solution. Examples are refugees in war zones who deposit their identity and diplomas on a Blockchain or closer to home, a Blockchain alternative for Facebook where users have complete control over their online identity data. These examples are no longer future scenarios; over the past ten years, start-ups have actually set up small-scale Blockchains for all of these applications. In brief, Blockchain has already proven itself as a technology that has the potential to make the world a better place by realising an Internet of trust.

There is, however, a drawback to this development. There are numerous examples of smart programmers who launched a new token similar to Bitcoin and in a short period became crypto millionaires. The market mechanism that made this possible –initial coin offerings (ICO)– at many Blockchain companies transpired to be little other than an unregulated shares market where companies without supervision could issue shares that represented no genuine economic value. Consequently Blockchain has mainly become associated with the speculative crypto value bubbles over the last two years. This has damaged the reputation of the entire sector.
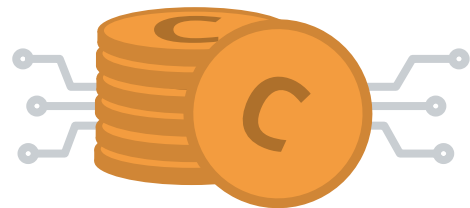
Initial Coin Offerings (ICOs), as long as these represent a genuine value, are an interesting technical phenomenon related to Blockchain. ICOs are the initial issue of a coin or token on a Blockchain. Tokens can represent many different things and with the issue or sale of tokens money can be raised in many different ways and businesses/initiatives and start-ups can be funded.

There has been substantial growth in the use of tokens as a means of funding. Although some money evaporates via this construction it is nevertheless a new form of financing. In the "old world" shares were issued for this, loans concluded et cetera, and for such instruments relevant legislation and the associated clarity are in place. Tokens representing a share or loan are rare. Consequently the vast majority of tokens fall outside of existing legislation. This other category of tokens is referred to as utility tokens.

Blockchain entrepreneurs need to know how utility tokens are dealt with in the Netherlands and investors need to understand what these tokens entail. Clarity is needed about the boundaries of what is and is not permitted, what the tokens are, how these are valued and the consequent fiscal implications.

DBC urges the adoption of a clear position with a certain durability of the stances taken, as that will benefit the location climate of the Netherlands.

The Blockchain sector can play an important role in this by establishing a covenant with several basic rules: no fraud, following the guidelines concerning anti-whitewashing/terrorism funding and a duty of care for small investors.

The call for a new regulatory system is regularly heard. Government bodies and the sector are responding to this at both the national and international levels. One such example is a discussion about the regulation of ICOs facilitated by the European Parliament Innovation Group. These initiatives might lead to new frameworks.

DBC observes that Blockchains for Good do not come about by themselves; these require powerful public-private impulses as well as a new form of governance that puts the public interest first. We do not have to look that far back in history to underline the importance of this vision.

When the Internet developed at the start of the 1990s, governments worldwide mostly kept a distance, with the result that 25 years later a cyberspace has been created that is owned by everyone and no one. Large market parties have received all the space they need to develop platforms that in practice appear to do more to undermine democratic values than to uphold these. Meanwhile, however, citizens worldwide have become entirely dependent on these platforms.

Blockchain technology offers the possibility to effect a paradigm shift: from a centralised digital infrastructure, such as that of the current Internet, to a decentralised infrastructure in which trust and security can be better safeguarded.

However, just as during the development of the Internet, such a new digital infrastructure –similar to an ecosystem– needs to grow organically. Nobody can achieve this alone. Therefore with the establishment of DBC the choice was made for a very broad public-private coalition.
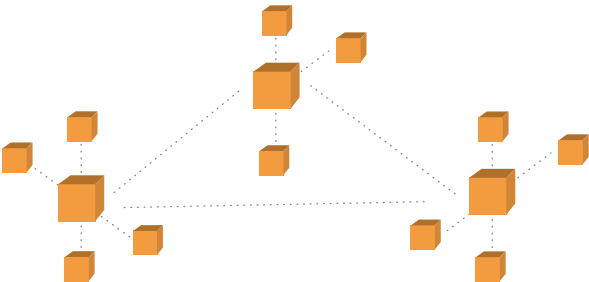
Blockchain: the digital variant of a 2500-year-old principle

The essence of Blockchain technology is that databases are managed decentrally in a network, instead of by a central body, as a result of which every participant (node) in the network has a copy of the entire database.

This principle of a collectively managed, shared "cash book" is nothing new. About 2500 years ago the inhabitants of Micronesia used large heavy stones as currency. Important transactions were paid for using the so-called "Rai stones". However, instead of physically moving the stones from owner to owner, all of the stones stood in the middle of the village. There all transactions were verbally shared with all villagers, which meant that every villager knew who owned which stone. If a property dispute arose, there was always a majority in the community who could establish who owned the stone because everybody had been present at all of the transactions. With this approach, a "mental", decentralised cashbook arose in the heads of the villagers and "banking" could be done without the need for a third party.

In effect, Blockchain technology is nothing other than a digital variant of the centuries-old principle, but now in the digital domain. If the transaction is performed via the Blockchain, all nodes are informed of this and after a cryptographic verification process the Blockchain is updated: a new block is added to the chain. All participants, nodes, subsequently receive the most recent version of the Blockchain.

Why is Blockchain so secure? The comparison with ancient Micronesia can also explain this. If a villager back then

wanted to commit fraud or theft, he would have had to convince a majority of the entire village to "defend" him. In precisely the same way, a user in a Blockchain network must corrupt the majority of all Blockchain copies in the network if he wants to hack the system. This is theoretically possible with a considerable amount of computer power, but when there are hundreds or even thousands of nodes in the Blockchain then this is practically impossible. Bitcoins are sometimes stolen due to insecure password management, but up until now the actual Bitcoin Blockchain has only been hacked once.

There are many possibilities and options for building a Blockchain. There is no single standard approach. Blockchain technology is sometimes therefore compared with LEGO: with a limited number of blocks you can make a vast number of different shapes. For example, there are completely decentralised Blockchains that are accessible (permissionless) for everybody but also Blockchains that are managed by just one or several parties (permissioned).

Due to the complexity of setting up a Blockchain there is a risk that discussions and thoughts about Blockchain mainly concern the technology. However, the first question we need to ask ourselves is from which ethical perspective we want to use this technology in society. How, just like in Micronesia 2500 years ago, can decentralised management of data actually improve society and increase the trust between citizens and government and between different citizens?

The societal importance of Blockchain

Blockchains cannot solve everything but they do have the potential to help resolve an important trust problem in the economic architecture of society. If we have a system that reliably registers a series of status changes in a particular dataset and does this in a way that cannot be changed by a single party without the consensus of the rest, then we can remove a layer of uncertainty within supply chains and other forms of chain collaboration. If we are honest, spreadsheets and other business software solutions have not solved all the problems of data management, but they have improved the situation. With Blockchain we want to improve the trust layer specifically. Not any old layer but perhaps the most important layer: the actual ledger.

Ledgers have a long history of being very important for society. By creating an overview of transactions that different people often refer to, communities have created a shared truth, a recognised basis for entering into collaborations and economic exchanges. (Note: we are not talking here about absolute truth, but the standard of the truth as accepted by everybody, a consensus.) In fulfilling this role, ledgers have always been vitally important for how we solve our mutual lack of trust.

The problem was that because we also had to trust the centralised ledger keeper to define the truth, we have incorporated another vulnerability into this important archive layer, the dependence on "trusted third parties". This is where the added value of decentralisation lies.

At present, this dependence mainly manifests itself in citizens' dependence on these trusted third parties for almost every single digital transaction. In the case of financial transactions, this is banks and for real estate transactions, it is the cadastre and the solicitor. However, pension funds, energy companies, telecoms providers and housing corporations are also effectively intermediaries that manage the transaction data of citizens. Even for the most fundamental personal data, the personal identity, citizens are dependent on a trusted third party, namely the Municipal Personal Records and Travel Documents Database where municipalities and the Ministry of the Interior and Kingdom Relations keep our identity.

In the Netherlands things are well regulated. Fortunately, we live in a democratic constitutional state where these bodies are subject to supervision and control. Solicitors provide us with the certainty we need regarding the agreements we make; our personal details are stringently kept, the cadastre records the boundaries of the land that we purchased and we can safely make financial transactions via the banks. These bodies work on improving that service, which includes the use of Blockchain. However that legal certainty is not so well arranged everywhere and in the Netherlands, many improvements are still required.

Furthermore, there are new developments where the information about us and the transactions we perform must be protected. Our increasingly digitised world is leading to an exponential growth of data and that poses considerable challenges for our society. How do we protect privacy, how do we combat cyber criminality and how much power over citizens do we want to give to private digital platforms? These are not abstract policy issues but part of the everyday conversations at the dinner table of many Dutch citizens. The misuse of Facebook data by Cambridge Analytics and other privacy infringements by tech companies means that people are concerned about the growth of digitalisation and technology that they no longer understand but nevertheless depend on. The centralised architecture of almost all online services is vulnerable, however secure it is made. Put simply: storing data centrally means that if a hacker hacks the central server, he can immediately cause considerable damage.
So although a Blockchain is not perfect and a Blockchain can also contain bad stuff, it is often better, and in many cases quite a bit better, than the status quo.

You can do a lot with a data logbook everybody trusts, even in situations where you cannot necessarily trust the persons who are entering the data. If you combine a decentralised immutable logbook with other resources for information management, such as data analysis or artificial intelligence, then eventually it should be possible to remove false values, which humans can scarcely detect, from possibly unreliable data sources. With a consistent, sabotage-proof, generally accepted logbook for data input computers can more easily detect deviations in data. With this approach not only people but also devices can be tested by creating feedback loops that iteratively increase the reliability of the entire system. This is why Cisco and others incorporate a Blockchain in solutions to demonstrate the reliability of Internet of Things devices.

Another advantage of Blockchain is that interaction between databases can be improved. In the current digital architecture, allowing different databases to communicate with each other efficiently is a complex process. Take, for example, a monetary transaction between two people via different banks. In that case an intermediary is needed to ensure that the transaction takes place in a reliable and auditable manner. Has a euro actually been debited from the one database and credited to the other? That sounds incredibly simple but the smallest of errors between databases can have major consequences for both citizens and society. Therefore communication between databases is often expensive and slow, and many transactions are associated with numerous time-consuming administrative and bureaucratic steps.

Blockchain technology offers a solution to this inefficient communication, for example through the use of smart contracts. A smart contract is recorded in a Blockchain, automatically realises a predetermined agreement without the intervention of third parties and subsequently records the task performed in the Blockchain. This allows implementation periods, payments and property transfers to be reliably automated and registered. A future example could be a self-driving car that automatically charges itself at a charging station after a journey and immediately pays for the service via a smart contract.

Of course we need to ensure that we do not indiscriminately automate everything. The Council of State has quite rightly stated that we must not lose sight of the human factor. Automated decision-making in a government context must take place extremely carefully. We must be able to understand, clarify and explain issues, and reverse these if the algorithm leads to incorrect choices.

> *The vision of DBC is that Blockchain technology due to its transparency and non-repudiation contributes to fundamental trust in our societal infrastructure.*

A durable infrastructure

Historically the Netherlands is a high-trust society. We have a well-functioning constitutional state, are one of the least corrupt countries in the world, and possess highly reliable systems of ownership, transactions and identity. Thankfully, reliable third parties in the Netherlands are in most cases genuinely trustworthy and Blockchain technology is not needed to replace numerous failing authorities. We need to look ahead, however, and ask ourselves how we can maintain the position of the Netherlands as a trust society in the near future if technologies such as artificial intelligence and the Internet of things lead to an exponential increase in the number of digital transactions between literally everything and everyone. In the hyper-connected society of tomorrow, Blockchain will not be a luxury but a necessity.

Besides the national interest for the Netherlands, there is also a major interest in developing Blockchains for Good. Digital warfare, the hacking of elections and cyber criminality can be more effectively combated if, at an international level, more secure digital infrastructure is built with a key role for Blockchain technology. Furthermore, in countries where government functions fail and democratic values are violated, Blockchain can make a real difference for citizens. Therefore bodies such as the World Bank, the United Nations and the World Economic Forum are currently showing an increasing interest in Blockchain technology. At these international bodies, DBC has already presented itself as an inspiring partnership that achieves concrete results.

The Dutch Blockchain Coalition in action

The vision of DBC is that Blockchain technology due to its transparency and non-repudiation contributes to fundamental trust in our societal infrastructure. In the period 2017-2018, the partners of DBC invested more than 1 million euros and also made 30 FTE available to realise an action agenda with three lines of action: the development of building blocks for digital identities, the realisation of conditions for utilising Blockchain – including the establishment of a research agenda– and the development and realisation of a Human Capital Agenda.

At present, online identities are often verified via Facebook or Google accounts. These accounts function as digital passports with which you as the owner can verify your online identity to third parties. Such an identity check has a major disadvantage: you have no control whatsoever regarding which personal information is shared. Perhaps you only want to demonstrate that you are older than 18 years, but meanwhile where you live, your purchasing behaviour and where you last logged in, is shared with a third party.

In the first line of action, DBC has worked on an initial answer to this dilemma concerning digital identity. For example, a digital identity where citizens retain 100% control is being worked on. This so-called **self-sovereign identity** is a digital passport that the citizen installs via a Blockchain app on his or her smartphone and that can subsequently only be unlocked and used with a facial scan of the owner. This autumn, a prototype of this app is being tested in Eindhoven and Utrecht.

Further, DBC has investigated various identity platforms and has developed a framework for assessing these. Subsequently, the platform Sovrin was used to program various things to gain a better understanding of this platform and to evaluate its maturity.

Another important aspect was working on a specific use case based on self-sovereign identities. We chose to simulate a mortgage application with working code. That taught us which process underlies this and which issues you come up against.

We now want to accelerate progress on this subject and investigate the possibility of doing this via a permanent organisation. This is further explained in the SSI part of the use cases.

In the second line of action, research has been done over the past year into the conditions needed for Blockchain applications. Which consequences does this have for the social, legal, ethical and economic space? An example: if smart contracts are authorised to effect binding contracts then how do we ensure that these contracts also satisfy all existing legislation and how do we deal with disputes that can arise between conflicting smart contracts? Twelve lawyers within DBC who come from a wide range of organisations wrote a **Smart Contracts Report** that considered such crucial questions. Furthermore, over the past year various DBC workgroups have contributed to the standardisation and audibility of Blockchain applications in the ISO (worldwide) and CEN (EU) contexts.

In this line of action, **a research programme** has also been set up that focuses on several scientific and more fundamental issues, both opportunities and challenges, associated with the technical and implementation sides of Blockchain technology. Under the title "Dutch Blockchain Research Agenda", a coherent research programme has been drawn up that focuses on issues related to the specific characteristics of Blockchain technology, as well as issues related to the reliability, sustainability and governance of Blockchain technology.

In the third line of action, **Human Capital Agenda**, efforts have been made to develop Blockchain knowledge efficiently and to distribute this as quickly as possible in the Netherlands. A training module "Blockchain in a day" has been developed and offered to all coalition partners and stakeholders. A matching tool to link students, companies, universities of applied sciences and universities with each other for Blockchain research subjects has been developed as well. Within the network that has now arisen, the key competencies and profiles can be formulated for the Blockchain professional of the future and consequently which requirements degree courses should meet.

By bringing universities and universities of applied sciences together we are ensuring the mutual learning and alignment of the Blockchain curriculum. Instead of each institution developing its own teaching materials and methods, we are realising an ecosystem of education and research institutions.

All three lines of action will be continued in the coming years. The initial results delivered by the three lines of action demonstrate that the outstanding public-private partnership culture in the Netherlands has realised a synergy in the area of Blockchain in the form of DBC within a short period. The collaboration between government, industry and knowledge institutions, jointly referred to as the Triple Helix, is unique in the world in the field of Blockchain. Partly as a result of this, the Netherlands is viewed internationally as a leader in the area of Blockchain: in our country a relatively large amount of Blockchain research is carried out, many Blockchain pilots are taking place and there are many Blockchain start-ups.

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International
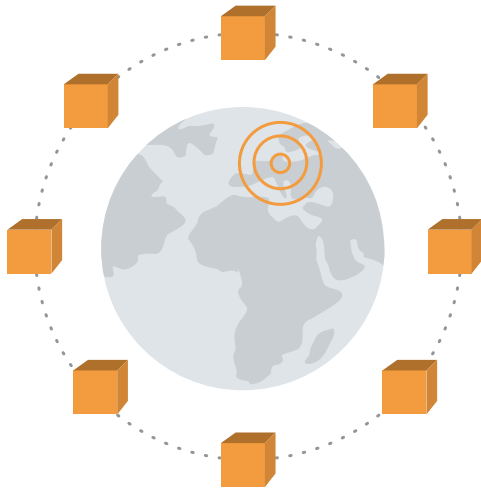
The international Blockchain landscape is evolving rapidly. So far in 2018, about 1.5 billion dollars has been invested worldwide in Blockchain development –double the figure in 2017– and it is estimated that in 2022, investments worldwide will exceed 10 billion dollars. Many of these investments are being made in Blockchains with a commercial objective (Blockchains for Money) or in Blockchains aimed at monitoring citizens. For example, the Chinese government is currently investing in Blockchains that in combination with artificial intelligence will enable improved surveillance of citizens (Blockchain for Control). At the same time, China is implementing a very restrictive policy on freely accessible, permissionless Blockchains.

This international array of forces offers a big opportunity and a considerable responsibility for the Netherlands to invest in Blockchains for Good. A big opportunity because in many sectors of our economy Blockchains for Good can yield significant savings and therefore increase the earning capacity of the Netherlands, and such developments will also provide a tangible response to the Dutch government's desire for the Netherlands to be a world leader in digitalisation. A major responsibility that the Netherlands, entirely in line with our tradition as an international defender of democratic values and human rights, must take to safeguard the protection of privacy, data security, self-determination, honest competition and accessibility in the digital domain.

The Dutch international focus, our trading spirit and current leading position in the area of Blockchain, have proven to be good enablers for international connections with Blockchain hubs in, for example, Singapore, Dubai, Seoul, India, Canada and San Francisco. Various collaborations have been set up with these hubs, such as outgoing and incoming Blockchain missions, hackathons, research programmes and joint projects. DBC has also entered into partnerships with international institutions such as the UN, World Bank, IMF and various NGOs.

Further DBC is collaborating intensively at the European level. For example, DBC participates in the **European Blockchain Partnership (EBP)** and DBC is helping to build the European Blockchain Services Infrastructure (EBSI) that will support the provision of cross-border digital public services. DBC is also making an active contribution to the workgroups of the **EU Blockchain Forum** and is taking the initiative to establish several cross-border projects at EU level in the areas of identity, logistics and diplomas, for example.

If the Netherlands wants to retain its leading international position and reputation then it must continue providing a podium for Blockchain initiatives and working on a healthy ecosystem. The establishment of more cross-border projects, organising congresses, designing or accommodating knowledge institutes and continued representation in international networks and standardisation bodies are vitally important in this regard.

The clear international presence of DBC has created a momentum: not only is the Netherlands seen as a frontrunner but our image as a testbed for international Blockchain collaborations is also growing. From this position the Netherlands can profile itself as the ideal location climate for companies and researchers from all over the world, a place where they can jointly test new developments and applications. By strengthening the frontrunner position of the Netherlands in this manner, we can exert influence on international standardisation and ensure that International Blockchains for Good are realised.

Next steps: the implementation of use cases

DBC focuses on the pre-competitive phase in which we distinguish the following elements:

- Orientation;
- Exploration;
- Research;
- Experimentation.

If experiments are successful and lead to market-ready applications then the pre-competitive phase has been completed and so also DBC's role for the application concerned.

After the orientation and exploratory phase, DBC now believes that in the period 2019-2020 the switch should be made to the next stage: research and field-based experiments. A large number of Blockchain explorations have led to proofs of concept from which the DBC partners have made a selection of highly promising use cases. These use cases are Blockchain applications with which we expect the Netherlands can achieve good results with impact on the private and public sectors and with a distinctive capability at the international level. Here we use a broad definition of use cases; in the sense of demonstrably valuable applications of new technology that we will directly benefit from. That will be assessed in the following experiments:

01 | Self-Sovereign Identity (SSI)

A self-sovereign identity (SSI) is the driving force for a supple interaction in the online economy with a direct impact on the physical world. That is only possible with government interactions and therefore participation,

especially for the confirmation that you who you claim to be and/or that you are 18+ and many other values. This is in line with the Digital Government agenda and the use cases diplomas and pensions, for example. The starting point is the creation of an open government in which the transition is made from the copying of information to the sharing of values about this information. The information remains the single source of truth.

DBC has built up a well-functioning collaboration over the past year. In the coalition participants have worked on knowledge and prototypes concerning SSI. This proposal intends to continue this collaboration and to professionally expand it to all relevant parties in the field of identity so that the realisation of SSI can be accelerated. Besides the components for this SSI, this concerns, for example, the construction of the digital identity infrastructure and a system of agreements. This identity infrastructure and the system of agreements should be linked with the existing identity services (e.g. DigiD) and provide openings for new developments such as SSI. This will lay the foundation for providing government services in which the individual takes centre stage.

This digital identity is vitally important and accordingly an action point for DBC. We are working on a proposal about how we can give this impetus. We know what we want to achieve and we realise that we need to do this with a substantial number of parties, not least the government. In the coming months, a concrete proposal will be drawn up, which must result at the start of 2019 in an entity that has sufficient funds to realise the implementation of SSI.

02 | Logistics

Blockchain offers many opportunities for logistics chains:

- more transparent, reliable and honest chains;
- fewer administrative burdens and more efficient transport including the limitation of emissions;
- cheaper associated services such as trade financing and insurances;
- a new energy logistics in which energy supply and demand, including the logistical impact of this, at both the market and physical energy system levels can be transacted decentrally.

This subject was chosen because various initiatives in the area of logistics are developing the fastest, logistics initiatives can be quickly scaled up worldwide, the Netherlands is a key player in logistics, and for the Dutch economy this will earn the most in both the short and long term. Internationally, many countries want to collaborate on this subject with important Dutch players, partly because these companies (such as Port of Rotterdam, KLM and Schiphol) have built up a good reputation in this area. Furthermore, due to the current turmoil in the geopolitical arena, there is a strong need to objectify trust in trade flows and to simplify processes. Finally it is important to have the financial sector, an important sector for the Netherlands and Europe, work more closely with the logistics sector.

03 | Educational certificates and diplomas

A student who wants to continue his or her studies at a foreign institution faces the challenge of sharing the diploma gained or required and getting this recognised as authentic. This mostly paper-based procedure often leads to much extra work for the student and places a burden on the administration concerned.

By developing a generic building block for the Dutch and European Blockchain infrastructure, official documents such as diplomas, certificates and registers can be reliably shared and verified. This case has already been tested on a small scale in several countries and is now ready for implementation and scaling up to the European level. See also **https://youtu.be/ozL5g6gcANo**.

04 | Pension

The changing employment market in which Dutch citizens change jobs with increasing speed and frequency, poses considerable administrative challenges for pension schemes that can result in uncertainties for pensioners. Compared to the current systems, several questions, such as 'how much pension have I built up where?', can be made easier to answer using Blockchain technology. The pension funds APG and PGGM already have the ambition of using Blockchain technology to increase the efficiency of parts of pension administrative processes, which will eventually lead to a structural reduction in costs for all pension participants. DBC is participating in this use case from the perspective that citizens should gain more control and ownership over their pension as well as increased insight into this.

> *By developing a generic building block for the Dutch and European Blockchain infrastructure, official documents such as diplomas, certificates and registers can be reliably shared and verified.*

05 | Compliance by design

Subsidies are an important tool for ensuring that we organise society in the way that we want. For example, subsidies for green energy, for farmers who produce what we need or for helping people who need help. However, the rules for such subsidies are often very complex for the recipients and we occasionally hear about subsidies being misused. What we need: more transparency and automation of processes so that it becomes easier for everybody. Blockchain offers that possibility. In the language of technology this is: "Compliance by design". In other words, the money is used for the intended purpose and in the intended manner.

In this use case, we will elaborate a specific application, but in a generic manner so that a wide range of subsidies can be built on this application. Then we will not have to reinvent the wheel each time.

With this case, we will help the Netherlands and it is hardly surprising that the EU is just as interested in the subject as well. We will share our experiences there.

Finally: a digital ecosystem of trust

Quite rightly, the term ecosystem is frequently used in the Blockchain world. Blockchain emerged as an open source technology that everybody could help to program, participate in and help take decisions about. As the current Internet increasingly appears to be the opposite of an ecosystem, namely a monoculture of several centralised platforms, Blockchain offers a unique opportunity to start from scratch and think about how we want to design our digital society.

However, because the technology is complex and Blockchains by definition require broad, international collaboration, governments and companies are challenged to operate outside their comfort zones. An ecosystem cannot be designed and rolled out from the top down. Instead it needs to develop from the bottom up. DBC wants to play a facilitating and catalysing role in this process so that partners dare to take risks. After all, natural selection is also part of the ecosystem: some Blockchain projects will fail, whereas others will further evolve into powerful applications. A lot is at stake and so this time round society must contribute ideas and decide on and dream about the digital infrastructure of tomorrow.

The Blockchains for Good that the Dutch Blockchain Coalition will develop in the coming years will ultimately contribute to a digital ecosystem where trust, security, freedom and equality are safeguarded.

This is a production of the Dutch Blockchain Coalition and its partners.
For further information, please visit: www.dutchblockchaincoalition.org/en or contact us via info@dutchblockchaincoalition.org.
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