Casaleggio Associati
Strategie di Rete

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Blockchain for Business

How blockchain is set to revolutionise the way in which companies operate



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Casaleggio Associati provides strategic Online presence consultancy services to Clients based on their specific needs and the market sector in which they operate, with the aim of advising them on their digital policy decisions and the setting of measurable objectives in terms of financial returns.

Strategic Consutancy and Market Sector Research

The Web makes it imperative for every organisation to adopt a medium to long-term strategy that defines the priority, the feasibility, the implementation and the evaluation of the return on investment. An Online business strategy implies an overall vision in which business models, advertising and web marketing are considered jointly. Casaleggio Associati develops specific Online business strategies for companies by utilising the specific specialised skills of its associates and partners and generates reports on the digital economy as an aid to understanding the various contexts in which the respective companies operate and the impact of new technologies on said companies, as well as to identify trends and future scenarios regarding Web development and E-commerce. Furthermore, the analyses undertaken also include the current status of Italian investment in research and development, Start-ups, Venture Capital, Private Equity and an analysis of the respective market sector in which client companies operate.

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How Casaleggio Associati Supports B2B Companies

Companies need to position themselves online and integrate their respective supply-chains with the Web in order to enable them to deal with changes in the market, optimise their costs and remain competitive by offering the new services that online trading has introduced into their respective business models. Casaleggio Associati supports companies by:

- Analysing their business models and defining an appropriate online B2B strategy
- Empowering and offering support to their sales force by providing online solutions
- Exploring new sales models via e-commerce and inter-company marketplaces
- Analysing international best-practices and considering ad hoc solutions for the companies
- Providing the companies with support in terms of their Advertising and Online Social Media Marketing
- Updating the strategy and the services offered by the retailers
- Integrating the product range on offer by creating innovative digital services
- Optimising the business supply-chain utilising online platforms

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Preface

Current Opinion

"Blockchain" has become the latest buzzword. However, just as many people considered TCP-IP to be little more than something technical that enabled people to have their own website or e-mail account back in the '90s, these days people believe that blockchain is a place where people can go to speculate on cryptocurrencies. Like e-mail, bitcoin is unquestionably the killer application that triggered it all, but there's a lot more yet in the pipeline.
In fact, the technology is evolving fast, and it's no mere coincidence that it all began with a white paper describing its potential features, published in 2008 by a guy called Satoshi Nakamoto, who still remains a faceless individual to this day.

The bitcoin blockchain was created the following year and, in 2015, along came the Ethereum blockchain with its Smart Contracts.
Just like the all-out war that broke out between the various browser applications in the early days of the Web, the war has now shifted to the choice of which platforms and interfaces to use to access this new technology.
As well as the tools and the companies that will emerge and position themselves within this new context, we will also witness the emergence and the amendment of property rights like copyright, which is set to be totally overhauled yet again.

Just as was the case back in the '90s, these days a new opportunity has been created within a new context that is set to totally reshuffle the current position of the major players and thereby enable the emergence of new business models. It's no mere coincidence that, in the first six months of 2018, four Italian companies obtained more funding via blockchain than all the other companies put together managed to do via the Italian venture capital system.

Davide Casaleggio

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Methodology

Research objective

Our research is aimed at providing a snapshot of how blockchain technology is being used within corporate processes with a view to its possible uses and potential impact.

Scope of reference

Blockchain technology first emerged back in the '90s, however, what is described in this study is the current state of affairs and essentially constitutes a snapshot of numerous practical corporate applications in various business sectors.

Contextual background information

Contextual background information was acquired via online studies and related analyses conducted around the world. Furthermore, a series of interviews were conducted with a number of blockchain technology producers that have been operating in Italy, as well as a number of companies that have adopted these technologies within their Italian operations.

Satoshi's bitcoin account is now worth billions and, notwithstanding the fact that no one knows exactly who he is, in 2017 Forbes placed him in 44th place on their list of the 50 wealthiest people in the world.[1]

"On the Internet, no one knows that you're a dog."
Peter Steiner
"On blockchain, no knows that you're a fridge."[2]
Richard Gendal Brown

[1] Source: Bitcoin's creator is now one of the richest 50 people in the world – we just don't know who they are, Business Insider, 2017

[2] Source: Blockchain: Ultimate guide to understanding blockchain, bitcoin, cryptocurrencies, smart contracts and the future of money, Mark Gates, 2017

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The Blockchain Market

In 2017 the value of the global blockchain market reached 339.5 billion Dollars and is expected to rise to 2.3 billion[3] by 2021. By 2027, 10% of the entire global GDP will be generated by products and services traded via blockchain[4].

The sectors that currently contribute most towards generating this value are the financial sector with a share of 60.5% and the manufacturing sector with a share of 17.6%[5]. It is estimated that by 2024 the significance of the media and advertising sector and the public sector will increase. Even the value of the healthcare sector, currently estimated to be worth around 53.9 million Dollars in 2018, is expected to rise significantly and is forecast to reach 829 million Dollars[6] by 2023. Nevertheless, the financial sector will continue to be the biggest contributor to global GDP.

Global investment in this technology is increasing constantly. In 2017 a total of 945 million Dollars were invested and that figure is set to rise to 2.1 billion this year. According to some forecasts, the level of investment will hit 9.7 billion by 2021, an increase of 81.2% in just four years[7].

The US market is the largest investor in blockchain solutions and is expected to reach 4.2 billion Dollars[8] by 2022. The European market is the second-largest investor geographically and its investment value of 400 million Dollars in 2017 is set to rise to 3.5 billion by 2022[9]. The drive in favour of this technology is being provided both by private companies and the European Union which, merely by way of example, in December 2017 put out a *Blockchains for social goods* tender worth some 5-million Euro, to be awarded for blockchain technology based social innovation solutions[10].

The blockchain application platform is also rapidly penetrating the Asia-Pacific region. China, for example, has explicitly identified it as being a pillar of the Country's economic development. To date, 51% of the area's financial companies already

[3] Source: Size of the blockchain technology market worldwide from 2016 to 2021 (in million U.S. dollars), Statista, 2018

[4] Source: World Economic Forum, 2018

[5] Source: Distribution of Blockchain market value worldwide in 2018, by sector, Statista 2018

[6] Source: Blockchain Technology in Healthcare Market by Application - Global Forecast to 2023, Market Research 2018

[7] Source: Worldwide and U.S. Blockchain Services Forecast, 2018–2022, IDC 2018

[8] Source: Worldwide spending on blockchain solutions from 2016 to 2022 by region, Statista 2018

[9] Source: Worldwide and U.S. Blockchain Services Forecast, 2018–2022, IDC 2018

[10] Source: La blockchain è l'innovazione più importante degli ultimi 30 anni. E l'Italia che fa?, Il Sole 24 Ore, 2018

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have a blockchain strategy in place while another 45% of companies are in the process of developing one[12].

In the first half of 2018, venture capitalists invested some 1.3 billion Dollars in blockchain related start-ups, well more than the total sum invested throughout the entire previous year (900 million Dollars)[13]. To this we have to add the estimated ICOs, which amounted to 3.3 billion Dollars of funding in the first quarter of the current year[13].
Here in Italy, in the first six months of 2018, four start-ups managed to raise 70 million in funding via ICOs (or Initial Coin Offerings) on blockchain. This figure exceeds the total sum invested by the entire Italian venture capital system over the same time period. However, in order to obtain this funding, they had to look to foreign investment:

- *Eidoo* is a platform used to run the cryptocurrency supply-chain: 28 million Dollars
- *Aidcoin* is a platform used for donations and social impact activities: 15.8 million Dollars
- *Xrib*a is a service for managing cash-flow and the transparency of investments: 15 million Dollars
- *Friendz* is a platform that makes it possible to receive payment from the major brands in return for using the social networks: 12 million Dollars[14]

These investments are accompanied by the obvious financial benefits deriving from the application of blockchain technology. For example, one study conducted in the banking sector estimates a 30% reduction in infrastructure costs, which translates into a saving of up to 12 billion Dollars a year. Furthermore, blockchain will also enable the release of significant current provisions held as guarantees against non-payment, thereby increasing available liquidity for investment[15].

Other potential benefits of this technology include cost savings, traceability and transparency, increased revenues, reduced risk, the creation of new business opportunities and a greater client-focus[16].

[11] Source:The Future of Blockchain in Asia-Pacific, Cognizant Report 2017

[12] Source: ICOs Delivered At Least 3.5x More Capital To Blockchain Startups Than VC Since 2017, Crunchbase, 2018

[13] Source: The Pulse of Fintech, KPMG 2018, IcoRating

[14] Source: Blockchain e ICO, 4 startup italiane raccolgono 70 milioni ma fuori dall'Italia, Economy Up, 2018

[15] Source: Banking on Blockchain: A Value Analysis for Investment Banks, Accenture e McLagan 2017

[16] Source: Blockchain Survey April-May 2018, Capgemini Research Institute, 2018

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The Blockchain Market

Globally, to date only 13% of senior IT leaders have a blockchain project planned for their respective company[17], but there is an ever-increasing demand for people to implement blockchain related projects, so much so in fact, that in just one year, the number of jobs advertised on LinkedIN for experts in this field has tripled[18].

In Europe, only 3% of companies currently have a large-scale blockchain project in progress, while only 10% have undertaken a pilot project and 87% only have a draft project at this stage. The resistance remains strong and is mainly linked to the definition of a business model. 70% of the companies have chosen not to adopt blockchain due to the absence of any clear return on investment. 67% of them believe that the technology has not yet been perfected, while 64% of them reckon that the applicable regulations governing its use are still inadequate. A further 62% of companies have privacy concerns and another 59% are concerned about the issue of transaction security[19].

One market that is already well-established at this point is the cryptocurrencies market. At the moment there are approximately 1600 of them out there, with a combined market capitalisation value of some 289 billion Dollars[20]. This value is rising strongly and at the same time also fluctuating wildly, and increased from 16 billion Dollars at the beginning of 2017 to 20 billion at the beginning of 2018 before settling at its current value. In 2017 the bitcoin cryptocurrency made up 40% of the market at a price of around 2,800 Dollars per unit and a capitalisation of over 45 billion[21].
Forecasts indicate that the value of the bitcoin is expected to hit 25,000 Dollars by the end of the year[22] and 250,000 Dollars by 2022, with a 30% market share[23]. The bitcoin is used as an alternative currency. In January it was worth 0.5% of the market value of gold, whereas it is now worth 3.3%. This same growth can also be seen in the daily trading volumes, which have risen from 0.1% to 3.1%.

Blockchain technology is currently stirring up quite a bit of controversy. In order to explain its impact on the market, we quote the example of the Long Island Iced Tea Corporation, which changed its name to the Long Blockchain Corporation back in December 2017 following the NASDAQ's ultimatum to the company, warning that it risked being de-listed if its capitalisation remained below 35 million. Thanks to the Hype-effect, after the name change, the company's value shot up immediately[24].

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The Blockchain Market

For instance, right now there is about $80 trillion worth of flat currency in the world. I believe that cryptocurrencies will expand that market.
I think that cryptocurrencies will eventually grow to maybe $100 trillion and flat currencies will fall from $80 trillion to $30 trillion.

Tim Draper, Interview to Forbes

[17] Source: Catch me if you can: A c-suite guide to blockchain, IDC Connect 2018

[18] Source: Job Hunting? Blockchain-Related Postings on LinkedIn Have Tripled, Bitcoin Magazine, 2017

[19] Source: Blockchain Survey April-May 2018, Capgemini Research Institute, 2018

[20] Source: Guide To Top Cryptocurrency Exchanges, Forbes 2018

[21] Source: Le criptovalute valgono 110 miliardi. Ma il rischio bolla è in agguato, Il Sole 24 Ore, 2017

[22] Source: Crypto Bull Tom Lee Owns Up After Bitcoin Prediction Goes Awry, Bloomberg 2018

[23] Source: Tim Draper On The Future Of Cryptocurrency, His New Book And Why Bitcoin Will Hit $250,000 by 2022, Forbes 2018

[24] Source: The iced tea company that added 'Blockchain' to its name and doubled its share price could now be delisted from the Nasdaq, The Star 2018

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Doing Business on Blockchain

Blockchain currently has three established levels of business initiatives based on three distinct system functionalities, namely:

Registers
The fact that the register information cannot be edited means that events can be authenticated with a definite timestamp.

Token
The fact that digital tokens cannot be duplicated means that they cannot be spent more than once, thus increasing their intrinsic value.

Smart contract
The self-activated nature of these contracts enables new kinds of business models.

The most strategic aspects, which are applicable to all three of the aforesaid functions, are those pertaining to the Final Link, the one that links the blockchains to the real world. More specifically the three aspects are as follows:

Internet of Things
The objects linked to the Internet that can detect events and activate new ones, as well as identify products and assets.

Cryptocurrency in the real world
The value created on the blockchains can be transferred and spent in the real world.

Legal value
The legal basis on which contracts entered into in blockchain can be enforced.

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SMART
CONTRACT
TOKEN
CRY
PTO
GEN
REGISTRI
PRIVATE
TOKENIZ
VALORE

Business Registers

The first utilisation level of blockchain is linked to its non-editable function. The transactions recorded in the register cannot be changed by anyone[25], nor can they ever be deleted.
Thanks to this feature, blockchain technology is essentially like having a digital notary that certifies events and data and attaches a locked datestamp linking them to a specific date.

The distributed certification of events generates a new way to archive and provide proof of events in many different areas relating not only to specific individuals but also to companies, the State, artificial intelligence objects and much more. This latest way of utilising and certifying the authenticity of content will initially lead to the emergence of new search engines that enable users to view, compare and analyse information, but with an important added dimension, namely the time factor.

The concept of certification raises a whole series of complex issues, like the fact that you may not want someone to view the content without first having an agreement in place between the parties. Well aware of its own limitations, the technology is already coming up with new solutions, like Hedgy for example, which utilises multisig encryption technology that enables the user to access the content of a document on condition that at least two of three possible access codes are provided. This method allows the user, for example, to grant access to an independent arbitrator to resolve any potential disputes.

Public registers

The most common of these are public records like land registers and that's why certain countries like Russia and Sweden have started registering the sales of residential properties, land and in future also car sales in a distributed and certified system on blockchain.
There are large numbers of public registers of public interest and the number of potential applications is increasing constantly. The Estonian traffic authorities receive certified computerised medical certificates on blockchain in order to enable them to issue drivers licences, with no need for the driver in question to provide any additional documentation. The Estonian healthcare ministry is currently even putting the organ donors register on blockchain so as to ensure adequate transparency, availability and access priority.
There are also numerous examples of academic applications, such as the Holbert-

[25] At least not without the consent of the majority of network nodes.

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son School in California, which will be using blockchain for its academic certificates, and Pisa University, which aims to certify its academic curriculum.
The ACI (or Italian Automobile Club) has created, together with EY, MyCar, a system that enables users to keep track of all events relating to a specific vehicle. What we're dealing with here are events that occur over time and that are specifically related to the vehicle maintenance supply-chain (such as services, repairs, tyre replacements, kilometre readings, etc.), the aim being to provide an accurate official record of a car's history that could be very useful, for example, when the vehicle is being sold.

The systems developed to date are also emerging in the more traditional notarial field. For example, UProov is a legal organisation that provides timestamps on photos, videos and audio recordings to guarantee their authenticity and can be submitted to a court as valid proof. Bitproof also offers a similar service for documents. Ascribe enables artists to declare ownership of their artworks and to create and register limited edition prints, including a complete history. Monegraph deals with the management and certification of artwork licences and the commercial utilisation of artworks.

In conclusion, there are even registers on blockchain that enable the user to store digital assets offline and to release them on demand, such as Goldilock.
These registers enable the user to record events and automatically record their outcomes without the need for any human intervention whatsoever.

Supply-chain certification

Within the sphere of global industry, the value of fake goods in circulation currently amounts to around 461 billion Dollars[26]. In addition to this, there are also other problems regarding product quality and safety, topics on which the consumer is often not adequately informed.

Blockchain technology assists companies with their supply-chain traceability, since it tracks the product from the origin of its various component parts all the way through to when it reaches the end-user. The company scores in terms of reliability and credibility, as well as having an effective tool for monitoring its suppliers. In turn, the end-user is now finally able to track the entire product supply-chain. In both cases there are also financial benefits to be had wherever the utilisation of this technology makes it possible to cut out the middle-man.

[26] Fonte: The 'fakes' industry is worth $461 billion, CNN Business, 2016

The list of companies that are already applying supply-chain traceability on blockchain mainly includes foodstuff manufacturers and large-scale distributors such as Walmart, Nestlé, Dole Food, Driscoll's, Tyson Foods and Unilever, who are establishing and applying proper methods to using blockchain technology in order to track their foodstuffs throughout their respective global distribution supply-chains. As from September 2018, Carrefour has enabled its Italian customers to access information regarding any product they may have purchased, via a QR code, and to view the product details.
The first of its products that Carrefour has made traceable is their antibiotic-free, free-range chicken and the Group's citrus fruit is set to follow suit shortly[27].
Barilla has started testing a system that involves the Basil producers and tracks every step in the cultivation, irrigation, the pesticides utilised and the harvesting of the product. Thereafter, every individual batch is traceable all the way through to final delivery. This tracking is only possible thanks to blockchain technology linked to the IBM Cloud infrastructure. Baci Perugina, backed-up by Microsoft, is also currently testing a product tracking system that goes all the way from its Italian manufacturing plant through to the foreign importers and distributors with a view to keeping out counterfeit products[28].
In 2018 Alibaba began testing a new initiative called Food Trust Framework, which enables Chinese shoppers at the Tmall Global (a marketplace owned by Alibaba) to track their shipments of foods from Australia and New Zealand every step of the way.

In addition to the tests being conducted by individual companies, other services provided by independent parties are also starting to emerge, such as Ifood, a food safety blockchain that not only tracks every step of the process from the farmer all the way through to the sale of the product and makes this information available to all the operators along the line, but also provides the end-user with a platform for widespread quality control. Here in Italy, DNV GL is busy developing MyStory, a solution that starts from the traceability of the supply-chain and, via a smart-label, enables the consumer to access verified information on the product's characteristics and origin 'from farm to fork'. The first practical application of MyStory was in the field of certified Italian wines. Similar solutions combine consumer transparency and the hindering of counterfeit goods which, to date, has resulted in losses amounting to around 2 billion per year. EY Italia is currently working on a similar project. Then there is also Where Food Comes From, which operates as an independent service to companies and certifies the origin of foodstuffs via QR Codes[29].

[27] Source: Carrefour lancia la prima blockchain dedicata alla filiera del pollo, Wired, 2018
[28] Source: Cioccolatini e pesto: così il made in Italy entra in blockchain, Il Sole 24 Ore, 2018
[29] Source: wherefoodcomesfrom.com

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There are also certain benefits to be had at the level of associations, as in the case of The Pacific Islands Tuna Industry Association (PITIA), an organisation that represents members from within the Tuna industry in the Pacific and has started working on a project, in conjunction with the WWF, to put a stop to illegal tuna fishing and human rights abuses in the area. It is estimated that the illegal fishing market is currently worth somewhere between 10 and 23 million Dollars worldwide[30]. Thanks to the advent of smartphones and to QR Codes on tins of tuna, this project now enables the end user to establish precisely where the fish was caught, the ship it was caught from and the fishing method used[31].

The State can also play a major role in terms of the certification of supply-chains. For example, the British Food Standards Agency has just completed a pilot project at an abattoir to confirm legal compliance within the facility[32].

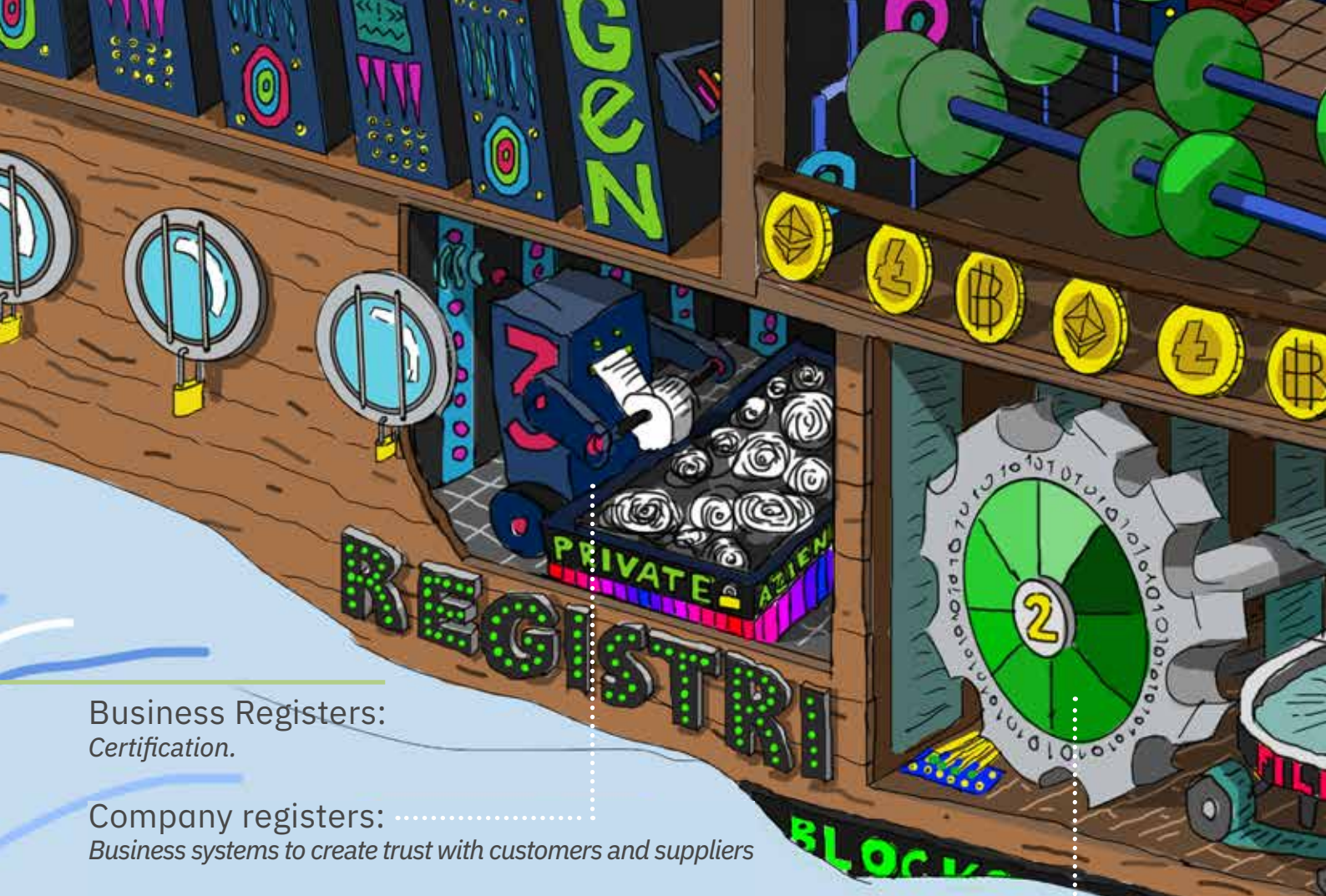
The use of blockchain to monitor supply-chains is not limited to the world of food and agriculture, however.
For example, the aim of the Everledger blockchain is to certify the respective origin of more than 1 million diamonds in order to generate a positive impact on society, the environment and the economy.

Mediledger, on the other hand, deals with the tracking of medical products and complies with the GSI standards that enable the identification, acquisition, sharing and mutual exchange of information and with making it available, in an understandable way, to companies and consumers throughout the supply-chain. This is also the aim of the French Blockpharma blockchain that enables users to track pharmaceuticals so as to prevent the marketing of any fake products.

The fashion industry is using blockchain to track the supply-chain and certify the origin of its raw materials. Normally a QR code is included on the label so as to enable the customer to check that the garment is indeed genuine and not merely a counterfeit.

In the maritime shipping industry, blockchain is being used to reduce 'trade finance costs' and all the associated administration costs, which amount to around 20% of the shipping costs. TradeLens blockchain shipping solution brings together 94 organisations, 20 harbour operators and numerous customs and excise authorities in a project that aims to reduce the transit time of shipments

[30] Source: fao.org
[31] Source: wwf.org.nz
[32] Source: food.gov.uk



Business Registers:
Certification.

Company registers:
Business systems to create trust with customers and suppliers

Lanexis records registrations regarding the status of trucks, links shippers and couriers, eliminating intermediaries (-30% of expenses) and guarantees safety standards.

LANEAXIS

Spotify recently bought Mediachain to create a fairer and more transparent system for managing royalty in the music world.

Spotify

Alice makes donations transparent: the donor pays the money only when the objective set by the institution is reached thanks to the number of participants.

alice

Nasdaq has invested $ 30 million in Chain.com to create a shared register between financial operators.

Nasdaq

Supply chain registers:
Registers for the certification of products by the companies of the branch

WWF traces the tuna supply chain to limit illegal fishing and the abuse of human rights. The information is available thanks to the QR Code indicated on the box.

WWF

Companies and large players trace the production chain especially in the food sector and make information available via a QR Code generating trust in the consumer.

Walmart · Alibaba.com · IBM Food Trust · Barilla · Baci

Everledge certifies the origin of over 1 million diamonds in order to favor a positive impact on social, environment and economy.

EVERLEDGER



Public registers:

Public-use registers accessible by all

MyCar is the public file to certify the activities related to the car and ensure the truthfulness of the information related to the vehicle when it gets sold.

Ascribe allows artists to create a wallet of works and to certify limited edition prints.

Sweden transfers land and buildings cadastre on blockchain, developing smart contracts for futuretrades.

The Estonian Ministry of Health is also preparing the register of organ donors on blockchains to ensure transparency, availability and access priority.

by up to 40% and reduce the billions of Dollars in associated costs. Maersk, the large Danish container company, claims that this platform "enables importers and exporters, customs agents, customs and excise departments and governmental and non-governmental agencies to collaborate in cross-organisational corporate processes and the exchange of information, all on a totally secure and fully-binding basis"[33].
Even the art world makes use of blockchain technology. For example, Verisart certifies the authenticity of artworks and their current location by tracking all their respective movements over time, thus facilitating the sale of the artworks and the art auction industry[34]. Along these same lines, DACC enables the settlement of plagiarism and copyright disputes relating to digital and media-related content and provides total control over the creation of, access to and storage of data.

On the financial front, the stock-exchanges were amongst the first organisations to test the technology in terms of their supply-chain, with a view to reducing the financial costs of duplicated processes and transaction times and monitoring all operations aimed at reducing their levels of risk and exposure. By way of example, the NASDAQ invested 30 million Dollars in Chain.com in order to set up a shared register between the various financial organisations. Other similar investments along these same lines have been made by the Australian Stock Exchange (ASX), the Japan Exchange Group (JPX) and the London Stock Exchange, while many others are also working on projects linked to blockchain[35].

In conclusion, development work is currently ongoing on across-the-board systems in various industries to ensure supply-chain traceability, such as, for example, Provenance.org., which aims to help cotton producers respond to consumer demand for greater sustainability and biodegradability of the fabric and increased reliance on renewable sources of energy.

Business confidence tool

Process transparency is not merely a supply-chain requirement, but can also be extremely a useful tool at the individual company level. Numerous companies have opted to create blockchain-based registers that can only be accessed by

[33] Fonte: Una cosa che la blockchain sta cambiando davvero, Il Post, 2018

[34] Fonte: Verisart brings blockchain certification to the global art auction market, Techcrunch, 2018

[35] Fonte: How Stock Exchanges Are Experimenting With Blockchain Technology, Nasdaq, 2018

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internal parties or by their respective partners. A new transparency-based system could facilitate the monitoring of processes at every level and by everyone and every entity involved.
For example, Spotify bought out Mediachain with the specific aim of simplifying and making the process of managing the payment of royalties to artists more transparent and equitable. The media and advertising industry is also going ahead with the creation of registers relating to real-time bidding (RTB) and the availability and effective utilisation of advertising space, in order to reduce the risk of fraud by advertisers.

In the transport sector, Laneaxis will use blockchain registers to store the data resulting from the ongoing monitoring the condition of each truck. Keeping these registers will enable the company to adhere to the required safety standards and to optimise its costs and services.

At the institutional level, the Chinese Government's Space Programme Agency will use blockchain technology to process thousands of invoices in a transparent way, thereby putting the brake on the illegal use of State funding.

For this very same reason, namely transparency in terms of the way in which our money is spent, the world of Charity organisations has created Alice, which is designed to improve transparency with regard to donations. The organisations on this platform set certain objectives that can then be selected by potential donors. However, the donor only pays over his donation once the objective set by the organisation is achieved thanks to the number of donations received.

Once again to protect everyone involved, large associations can use blockchain registers to ensure the transparency of the results achieved by the various entities that they support.
For example, the Climate Chain Coalition's aim is to develop technologies that enable the exchange of climate-related data and information on broad open networks. To be able to do this, the organisation has created the Carbon Grid Protocol on blockchain, which is designed to calculate the amount of CO2 generated.

In conclusion, blockchain registers can also be used to establish and control voting processes. There are already some existing examples of this, like the Bitshares blockchain platform, while the Liberal Alliance party in Denmark already tested a blockchain voting system back in 2014. The most recent example is the vote held recently in the Zug canton in Switzerland.

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Business Tokens

The second feature of blockchain, after the non-editable register, is the token, in other words digital currency. The distinctive feature of these digital tokens is that they cannot be reproduced. If we take a photo using our smartphone and we share that photo someone else, we are essentially making a copy of that photo, which means that there are then two existing copies of that photo stored on two different devices. Tokens, on the other hand, although they are also digital objects, just like photos, are no longer available to the original holder once they have been transferred and there is no way that he/she can "spend" them again. It's almost as if, having sent off the photo to someone, we could no longer view it on our cellphone. In fact, the transfer of ownership is recorded on the blockchain register and the token is then only available for the new owner to use.
This apparently simple feature enables us to manage the allocation and the exchange of valuables over the Web in a manner that is totally different to the way this was done in the past.

Cryptocurrencies as a self-generated value

The most well known tokens are cryptocurrencies like bitcoins. These were created in January 2009 and are merely a means for exchanging value, just like the shells used in Asia as far back as 400 BC.
The value of cryptocurrencies is exclusively linked to what people believe they are worth and the energy consumption required to generate them, which continues to increase over time.
The value is therefore not driven, guaranteed or controlled in any way by a State, but only by the system itself. Obviously it's important to be very careful about this kind of investment so as to avoid a situation where, as happened in the past, the cryptocurrencies change from being merely a means of exchange to being a prime target for financial speculators. The most renowned example of this is what happened in Holland with tulip bulbs in the 1600s, when the bulbs were worth more than a house and then turned into the biggest speculative bubble in modern history.
On the other hand, cryptocurrencies like bitcoins offer many advantages, like the absence of any bail-in mechanism (whereby the resolution of a bank crisis is entirely dependent on the exclusive and direct involvement of the bank's shareholders, bondholders and account holders), no public holidays, no withdrawal limits and no official bank working hours to adhere to.
These days there are literally thousands of cryptocurrencies out there on the market, a phenomenon that is reminiscent of what happened in the early 1900s when cars were a brand new technology and began to appear on the price lists of many manufacturers turned would-be motorcar dealerships, until the market became more consolidated as it matured. In the same way, there is bound to be a great deal

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of consolidation in the cryptocurrencies market in the next few years.
With this prospective in mind, there are numerous central authorities that are currently considering creating new digital currencies in the hope that theirs could become one of the few reference currencies of the future, in line with the so-called stablecoins linked to real-world values. Over and above the many rumours circulating about the possible creation of the Crypto-Dollar that would somehow be managed by the United States, there are also many other projects currently underway, like the Unity Settlement Coin (USC), a digital currency created by joint collaboration between the Swiss UBS bank and Barclays Bank, the Canadian Imperial Bank of Commerce, HSBC and MUFG.

Conversion of value into tokens

A further use for tokens involves the possibility of assigning them a real-world value. For example, these days you can go out and purchase a 30 million Dollar building in New York by means of the so-called "tokenisation of value" on the Ethereum blockchain.
The concept of tokenisation revolves around the possibility of representing the value of a certain asset as a number of shares, or in this case a number of tokens, which can be sold directly online on a blockchain.
A popular option at the moment if to raise funds from private individuals (crowd funding) to finance certain initiatives or to split up companies into tokens and sell them on blockchains via so-called ICOs (Initial Coin Offerings). This method is being used increasingly, so much so that the total value of funds raised in 2017, amounting to over 6 billion Dollars, was equalled in just the first quarter of 2018. Given that it costs a medium-size company around 3.7 million Dollars to list on the NYSE, ICO understandably becomes a very attractive alternative for many start-ups.
ICOs can also be viewed in a broader sense as simple shares. For example, the Paris Saint-Germain football team is currently launching a Fan Token Offering that offers token holders various advantages, including special deals, exclusive tickets and the chance to meet the players. The Newcastle and Cardiff football teams are set to follow the Parisian team's example.

These same bonds can also be recreated on blockchain too, as in the case of the World Bank's current offering.

The real killer tokenisation applications could, however, perhaps emerge from the world of video games, where the value of these games' digital assets is extremely high and can be bought and sold if they are hived off by the producers of popular games such as Farmville. Cryptocartz, an ultra-realistic, blockchain technology based driving simulator is yet another example that allows players to rent out or

lend their virtual vehicle to other players, with proof of ownership on blockchain.
In future, blockchain could become the global reference standard for transferring ownership of digital assets or certificates of ownership of physical assets. If this were a hypothetical equation, then blockchain would be to the transfer of value what standard containers are to the movement of tangible goods. Lower costs, greater speed and less hassle.

Conversion of labour into tokens

The third possible use of the token involves using them as a reward for people's actions. In this sense, the main applications include loyalty systems that reward customers with tokens in exchange for doing something that is beneficial to the company. There are already numerous initiatives out there that enable users to manage their corporate brand loyalty programmes, like block.gyft.com, Loyyal and Sandblock. The latter enables people to earn tokens in exchange for certain activities and to obtain rewards not only from the company that issued the tokens, but also from all the companies present on that specific platform.
Specific systems have also been created for specific sectors. One example of this is Trippki, which offers tokens in return for staying over in a hotel. Another is Travelchain, which enables users to list the details of all their previous trips and share it with tourism service providers in exchange for tokens, thus enhancing the value of every individual user's details.
Tokens can also be used to reward customer loyalty in the publishing industry. For example, the erotic website Tube8 is set to launch a blockchain platform to reward browsers with cryptocurrency tokens.
More generally speaking, new services are cropping up these days that enable users to manage community points systems involving points that are convertible into cryptocurrency, such as Bitnation.
In future, we will even get to the point of paying people for doing real work. A prime example in this regard is Steemit, a social network where people get paid for writing or editing posts. In order to protect the value of this particular token, some of the payments have to be held for anything from 3 months to two years before becoming convertible into the most commonly used cryptocurrencies.
Even doing searches on search engines can be a way of making money. For example, Presearch.org and Bitclave offer cryptomoney for online searches and they decide independently whether to keep the user within the search engine itself or rather to redirect them to websites like Wikipedia or YouTube instead. This model can also be used to encourage behaviours that support the local community in which we live. For example, Recycle to Coin and PlasticBank pay out rewards in cryptocurrency to anyone who takes used plastic to one of the participating shops to be recycled.

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Token:
Digital object that can be transferred from one person to another.

Token as an exchange tool:
The generation of cryptocurrencies on blockchains

Poloniex allows the purchase of Bitcoins, Ethereum or other important cryptocurrencies in exchange for traditional currencies such as euros or dollars. it was bought by Circle, a platform for mobile payments using blockchain technology.

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Bitcoin was created in 2008 by a person under the pseudonym Satoshi Nakamoto. Satoshi's Bitcoin account today is worth billions and has remained untouched despite today making it one of the richest 50 people in the world.

Token as a property certificate:
Tokenization of real assets

DTCC has created a system to manage credit derivatives such as unpaid bills. A market worth 11 trillion dollars.

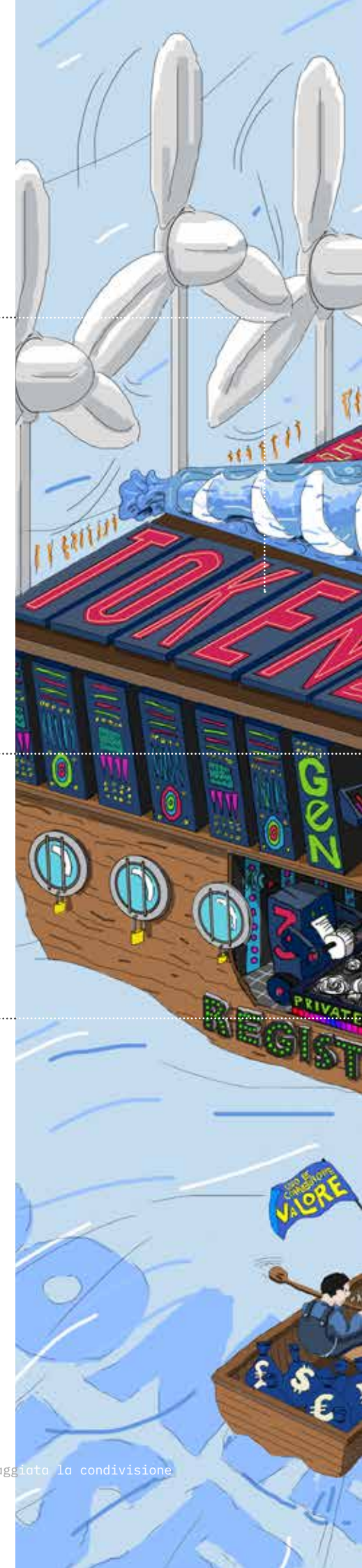
HelloGold will offer Gold-Backed Token (GBT), which can be marketed and used as a form of custody. It will be supported by 99.9% of the investment grade of gold and will constitute the so-called "stable currency".

Token in exchange for work:
Rewards with tokens in loyalty or activity

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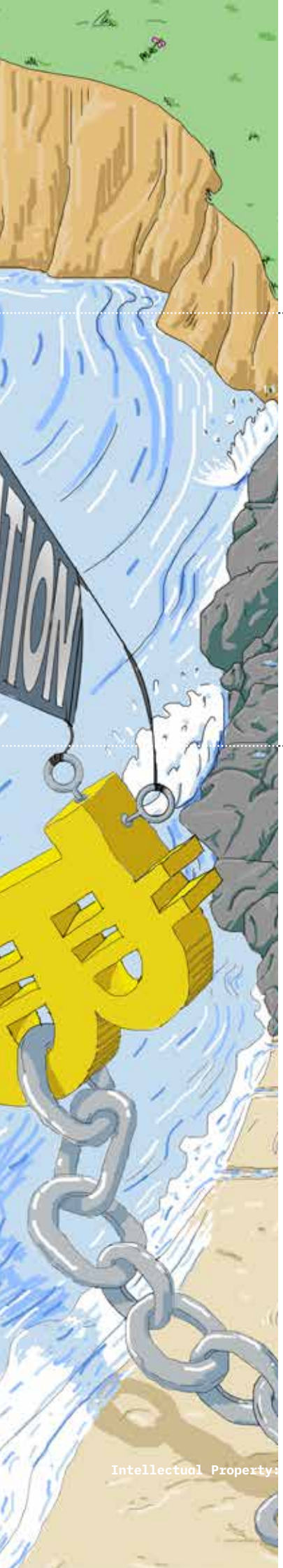
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Proprietà Intellettuale: Casaleggio Associati | È vietata la riproduzione ma incoraggiata la condivisione


Token come valore di scambio
Smart Company
SMART
CONTRACT
Token come titolo di proprietà
Smart Marketplace
CRY
PTO
TOKENIZA
TOKEN
Token per lavoro fatto
BLOCKCHAIN
BLOCKCHAIN



Smart Contracts:

They allow to automate exchanges and contracts.

Smart Company:

La'zooz is creating a decentralized platform for ride-sharing on blockchain, without intermediaries.

Climate Chain Coalition has created the Carbon Grid Protocol, an open and widespread data exchange on the network to reduce the environmental impact of virtual currency transactions, which depends on the country in which it is generated. Each payment transaction in Bitcoin will automatically be associated with the amount generated for CO2 and the payment of the related cost.

Lenderbot is a micro-insurance to protect the customers of sharing economy services. The policy can be added to purchases also through Facebook Messenger and thanks to blockchain the intervention of the guarantor authority is eliminated.

Axa offers an insurance that can be purchased from mobile, which in case of flight delay beyond two hours credits the amount due as soon as the plane lands automatically.

Smart Marketplace:

Openbazar is an open source and free marketplace. It does not require transaction fees or to list products and payment is in cryptocurrency.

Webjet manages room inventory on a private version of Ethereum to correctly pay all brokers.

ANIA has created the Alternative Dispute Resolution (ADR) project to resolve disputes without going to court.

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Smart Contract for Business

The third innovation introduced by blockchains is the Smart Contract. Having first mentioned this idea way back in 1996, Nick Szabo had to wait 19 years, in other words until 2015, to see his idea actually being applied on the Ethereum blockchain.

Smart contracts are in fact self-governing contracts. Once activated, there's no further need for any person or any lawyer to implement them since they are, in fact, self-implementing. Similarly, they automatically confirm that the contractual conditions are actually met and automatically pay over whatever is due, or trigger a pre-set action.
For example, if it is agreed that one party will accept a shipment of mozzarella cheese from another party, on condition that the temperature during shipping never exceeds 14°C, a sensor could be used to constantly monitor the temperature inside the delivery truck. Payment for the shipment or payment of any agreed penalties occurs automatically, in accordance with contractual terms and conditions, and the system has authorised access to both party's cryptocurrency accounts to settle the agreed sums.

This specific feature, which renders any kind of human intervention obsolete in terms of implementing Smart Contracts, clears the way for executing micro-transactions with none of the additional costs of traditional transactions. For example, Visa charges a minimum levy of 20 cents per transaction, thus discouraging the use of a Visa card to pay for very minor purchases. On the other hand, the cryptocurrency Dash charges a decidedly more negligible levy of between 1 and 3 cents per transaction and payments are processed, on average, within 3 seconds (compared to bitcoin's transaction time of 10 minutes).

The micro-payments and micro-events sector is potentially huge. By way of example, the insurance industry could process even the most routine events without any need for human supervision in terms of collecting premiums.
In the music industry, BeatBit is the first blochain-based digital music platform. It enables users to watch and listen to concerts taking place all around the world, in the comfort of their own homes, live and in full HD, at a cost that is less than that of a standard concert ticket.

In the near future, probably the most widespread application for this technology will be in the field of cars that can communicate directly with other cars or other devices to share information regarding, for example, overtaking manoeuvres or fuel

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and oil requirements. Volkswagen has patented a system that enables communications between vehicles to ensure appropriate safety-related action. The system uses blockchain to check the electronic signature of the vehicle sending the message, thereby ensuring that the information is genuine.

In future, the most frequent and probably also the most profitable transactions will be those linked to utilities. For example, energy trading could be managed automatically by the respective energy producers systems, those of the distributors and devices using artificial intelligence. Smart-grid utilities charges will be linked to a specific individual rather than to a specific physical address. These applications could also be added to micro-funding systems like those of the Grameen Bank of Yunus, the Bengalese economist and banker. Already now, possible uses are being explored in the insurance field: for example, Lenderbot is a micro-insurance specifically designed to protect sharing economy service customers and enables them to obtain customised micro-insurance cover via chat on Facebook Messenger.

The new intermediary-free marketplaces

Smart Contracts have also cleared the way for the advent of Smart Marketplaces, in other words distributed markets that have seriously re-dimensioned the role of the intermediary or agent since there is no longer any need for a third-party to act as guarantor. In many cases this role has disappeared entirely.

The so-called sharing economy can thus be applied to everything that we use or subscribe to, such as cellphone minutes for calls, Wi-Fi, or the utilisation of our own pc, car, bicycle or apartment. Anything can be shared and sold automatically on Blockchain.

Smart Marketplaces are already rather widespread and operate in various commodities sectors.

Openbazar, the open-source distributed marketplace that doesn't charge any transaction fee and on which payments are made in cryptocurrency, could very well at some point replace eBay. If you're wanting to buy or sell a luxury wristwatch, you could use Soma.co, which even allows the seller to transfer the original ownership certificate to the new owner.

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Blockchain for Business 2018

How the blockchain will revolutionize the way companies operate.

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Public registers:

Public-use registers accessible by all

MyCar is the public file to certify the activities related to the car and ensure the truthfulness of the information related to the vehicle when it gets sold.

Ascribe allows artists to create a wallet of works and to certify limited edition prints.

Sweden transfers land and buildings cadastre on blockchain, developing smart contracts for futuretrades.

The Estonian Ministry of Health is also preparing the register of organ donors on blockchains to ensure transparency, availability and access priority.

Supply chain registers:

Registers for the certification of products by the companies of the branch

WWF traces the tuna supply chain to limit illegal fishing and the abuse of human rights. The information is available thanks to the QR Code indicated on the box.

Companies and large players trace the production chain especially in the food sector and make information available via a QR Code generating trust in the consumer.

Everledge certifies the origin of over 1 million diamonds in order to favor a positive impact on social, environment and economy.

Company registers:

Business systems to create trust with customers and suppliers

Lanexis records registrations regarding the status of trucks, links shippers and couriers, eliminating intermediaries (-30% of expenses) and guarantees safety standards.

Spotify recently bought Mediachain to create a fairer and more transparent system for managing royalty in the music world.

Alice makes donations transparent: the donor pays the money only when the objective set by the institution is reached thanks to the number of participants.

Nasdaq has invested $ 30 million in Chain.com to create a shared register between financial operators.

Criptovalue in the real world:

Systems to spend cryptocurrency in the physical world

Coinbase makes it possible to convert cryptocurrencies into currencies at legal tender or in other cryptocurrencies. Earnings on the volume of transactions (commission between 0.25 and 1% paid by both buyer and seller).

The largest shopping center in Slovenia provides its 21 million annual visitors with crypt currency payments through Elipay, a mobile app for customers and a POS solution for sellers.

Bitwage is a Bitcoin-based payroll platform that allows companies to pay workers around the world in the currency of their choice.

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STRATEGIE DI RETE
Legal value:
Legal basis on which blockchain transactions can not be challenged in the real world
Uproov is a smartphone platform that allows you to instantly notify an image or a video or an audio created by a user via blockchain technology.
UPROOV
First electronic voting test in Switzerland: municipal votes managed via smartphone thanks to the digital identification system (eID) and certified by blockchain.
We.trade is a platform promoted by 9 international banks that through a blockchain constantly manages, remotely monitor and protect commercial transactions between European companies and the various stages of a sale or supply agreement.
SMART CONTRACT
AUTOMATION
VALORE LEGALE
TOKEN TRANSACTION
BLOCKCHAIN
Internet Of Things:
Objects that receive and send messages from the real world
Slock.it is based on Ethereum and allows you to unlock locks, for example to rent bicycles.
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ElectriC Chain
TBox is a cube that certifies the presence of the customer in a particular hotel and guarantees the truthfulness of online reviews.
Sponsor:
Posteitaliane
CONSULCESI TECH

Smart Contracts for Business

As regards the tourist industry, Cool Cousin is the latest evolution of Lonely Planet and Tripadvisor. Set up in 2016, it now has some 500-thousand users. Anyone who provides travel advice is rewarded with CUZ tokens directly by users of the service. There are quite a number of candidates in line that represent the future of the Airbnb model, including Lockchain, Betoken and Beenest, which operate as Smart Marketplaces for hotels and apartments, thereby totally eliminating the middle-man and his commission.
Traditional B2B tracking systems could be replaced by Winding tree, a tourism-related B2B marketplace that is promoted by a non-profit organisation and provides a whole range of services such as, for example, tracing lost baggage via blockchain. Given the important role that intermediaries and travel agents play in the tourism industry as a whole, ways are currently being developed to retain this role while, at the same time, facilitating direct transactions between the parties. Webjet is one example of this and manages an inventory of available hotel rooms on a private version of Ethereum, aimed precisely at ensuring that all the intermediaries are duly remunerated.

Obviously even fund transfers are changing and are becoming faster and cheaper. There are already various systems available on blockchain, like Abra, Bitwage and Coinpip. On the other hand, traditional bank loans could well be replaced by models like Celsius Network, a platform that allows users to lend out cryptocurrency at 5% interest and borrow money at 9% interest using cryptocurrency as collateral security.

The next Uber could use the same model as La'zooz, which is busy creating a decentralised, intermediary-free ride-sharing platform on blockchain. The marketplace in fact belongs to the users themselves, who are also able to make their own vehicle available to the service. The non-profit nature of this initiative has, however, hampered the process of raising the capital required to enable the project to take off.

Instead, the latest word in advertising trading systems is CIINCH Media Marketplace, which utilises blockchain to enable users to purchase advertising space from the traditional media like the press, radio and TV.

The surveys of the future could take place on the Augur.net distributed market for future predictions, on which people can predict certain events and win a prize in cryptocurrency if their predictions come true. A much more reliable system than traditional opinion surveys if you consider that the quality of group predictions generally exceeds that of individual predictions.

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The greatest potential of these Smart Marketplaces lies in the buying and selling of digital products and services. In the music field for example, Peertracks, Uio Music and Mycelia are Smart Marketplaces that enable artists to sell their music directly to the public without going via any middle-men.
Purchased product guarantees can be managed via Warranteer, which enables the user to generate, update and transfer guarantees on products purchased and registered on blockchain. In this way, the end-user can enjoy a guarantee even if the product was not purchased directly from the producer but via a middle-man or even on the second-hand market.
On the Gaming and Entertainment front, Gameflip is a Smart Marketplace that enables its 3 million registered users to buy and sell all kinds of digital games.
Kodak has instead re-launched itself onto the market, but focusing on the tech-industry this time around. On this basis, the company has developed two blockchain-technology based, namely KODAKOne and KODAKCoin, which give agencies and photographers greater control over the intellectual property rights deriving from their photos.

The NASDAQ blockchain will, instead, be used to trade pre-IPO shares (in other words the shares of a company that intends to list on a regulated market for the first time).

Another field that can now be managed via blockchain is that of inter-company negotiation and dispute resolution. The insurance industry has spawned the Alternative Dispute Resolution (ADR) project involving a number of insurance companies, including AXA, Cargeas-BNP Paribas, Cattolica Assicurazioni, Generali Italia, Helvetia, Reale, Sara and Zurich. The service will enable the companies to manage Auto-insurance dispute settlements by means of a blind-auction in which each of the two parties involved submits a fully-binding dispute settlement bid. In the event that agreement is reached, the system issues a binding Trusted Smart Contract.
S7 Airlines has entered into a partnership agreement with the Russian Alfa bank to manage the automation of operations between the airline companies and travel agents on a private version of Ethereum. Thanks to this arrangement, transaction processing times have dropped from around two weeks to just a few minutes.

The guarantee platforms could also in many cases be enhanced by intermediaries, as is the case of R3 consortium, which is currently collaborating with about a hundred international banks, including Intesa Sanpaolo, Banca Mediolanum and UniCredit, to develop an open source platform for recording, processing and synchronising financial transactions[36].

[36] Source: Mediolanum scommette su blockchain ed entra in R3, Il Sole 24 Ore, 2017

Smart Contracts for Business

On the B2B platform front, there are numerous projects currently underway, such as TraDove, aimed at ensuring speedy and secure processing of transactions between companies located in different countries. The project was designed to overcome the issue of trust and has made the TraDove social network available to its partners, on which the various parties can find each other and view the companies' trading history.

The next step will probably be Smart Companies, completely automated companies that will be able to function directly via blockchain. A prime example is the Flight Delay insurance service designed specifically to deal with flight delays, where everything from the calculation of premiums through to the settlement of claims is handled directly by the system itself.

Internet Of Things:

Objects that receive and send messages from the real world

Slock.it is based on Ethereum and allows you to unlock locks, for example to rent bicycles.

ElectricChain is a system that certifies the production of seven million solar power generators distributed in the world thanks to Sun Exchange. It uses SolarCoin as a cryptocurrency.

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The Final Link:

Digital object that can be transferred from one person to another.

Internet of Things

The Final Link

Looking at blockchain from a business persepective, a strategic spot emerges where companies should position themselves.
That is the final link of blockchain, in other words the link that connects the digital chain to the real world. It's only via this step that we will be able to manage the process and create a blockchain that is capable of generating real-world value.

There are in fact three types of final links, as follows:

- The Internet of things, objects whose sensors and active systems enable us to record and even to trigger events.
- Systems for utilising cryptocurrencies in the real world and enable us to convert virtual value into actual value.
- Legal value, which is what allows Smart Contracts to be equally legally binding in the real world.

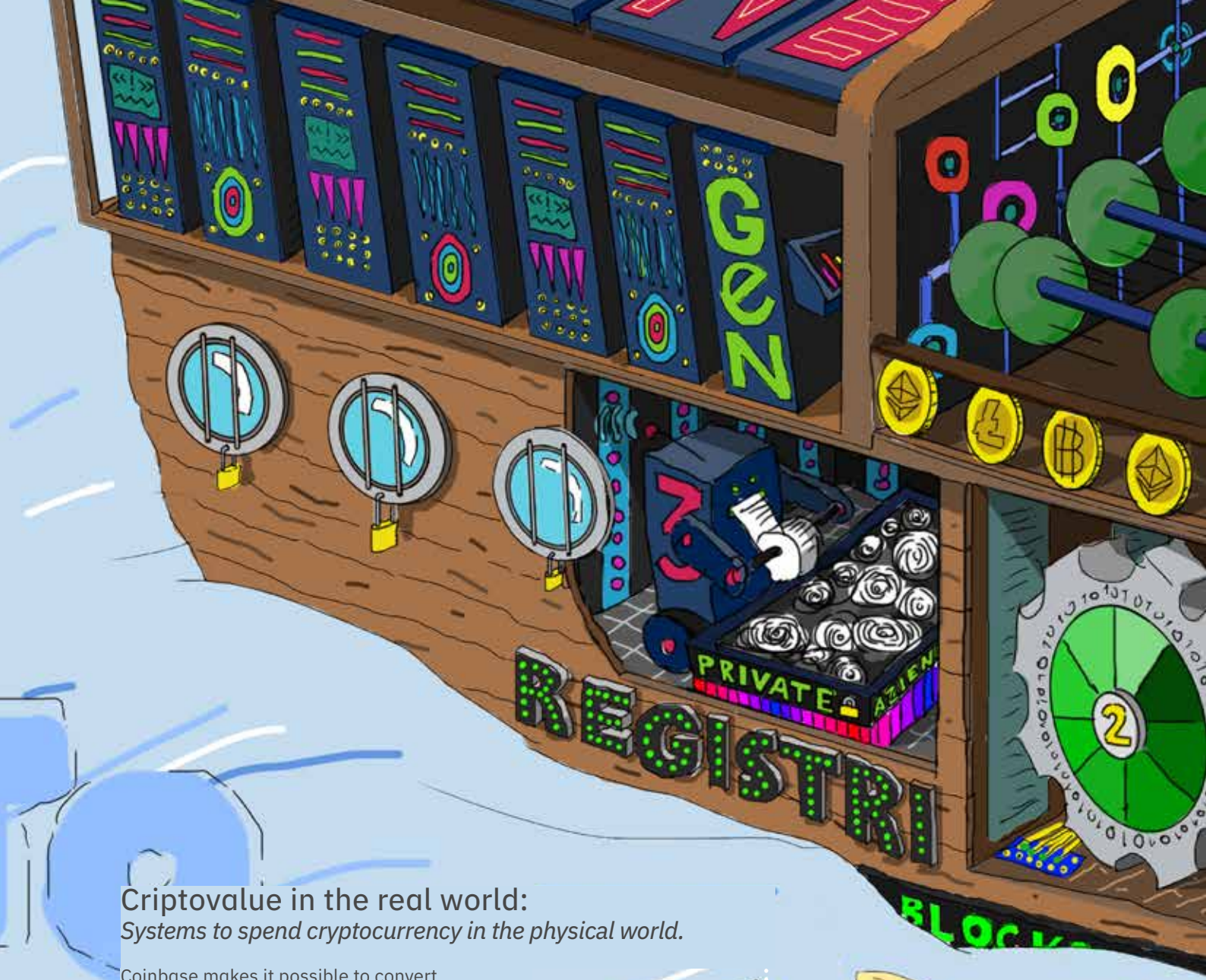
The Internet of Things

These are Internet-linked devices with sensors and active systems that enable us to record and even to trigger events.

The world of Internet-linked sensors enables us to record and certify events that occur in the real world. In many cases these events are the main inputs for Smart Contracts, which can only work if people believe that the Smart Contract itself works and that the data is properly recorded.
From a technology perspective, Internet-linked sensors are already quite commonplace and range from the thermostats in our homes through to our domestic weather stations, motion sensors, GPS units and step-counters.
The innovation that we're still waiting to see some way to ensure that the data gathered by the sensors cannot be edited and that the data can be easily accessed for a wide range of purposes. For example, Adidas trainers could reward their owner with points linked to a kind of customer-loyalty scheme.

The data could also be used in a collective way, as is the case with The ElectriC-Chain, a project that publishes information regarding the solar energy generated by seven million power generators worldwide, on blockchain.

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As regards devices that are capable of triggering real-world events, the main such system currently in use is in the field of locks. These systems require the user to enter a digital code in order to gain access to real-world assets. The most common current applications are used on cars and bicycles, even on a shared basis, but new systems are emerging in the field of access control to homes and hotel rooms, such as, for example, the Italian, Ethereum-based Slock.it.

Then there are also some more highly evolved devices with sensors that can also physically trigger certain events or actions. For example, Volkswagen is currently working on a blockchain-based system that will enable cars to "talk" to each other. The aim is to improve road safety by ensuring that cars are able to warn both oncoming vehicles and their respective drivers about a potential collision hazard.

There are currently also other applications, like Tboxchain which, thanks to the Tboxes mounted inside a hotel or restaurant and the ability to interact with the user's smartphone, enables users to check whether or not a customer review posted online is indeed genuine. This is an Italian project, promoted by the Ministry of Culture with the aim of improving quality and increasing transparency within the tourism sector.

Cryptocurrencies in the real world

The user must be able to utilise any value generated on blockchain in the real world as well. To this end, exchanges or systems have been developed for converting cryptocurrency into legal tender (or so-called Fiats). Examples include Kraken and Coinbase, which posted a turnover of 1 billion Dollars in 2017.
On the other hand, various businesses have adopted cryptocurrency as a valid means of payment for products and services rendered. The very first such transaction ever concluded was in Florida in 2010 by Laszlo Hanyecz, a developer at the time, who bought two pizzas from Domino's Pizza, for which he paid the princely sum of 10-thousand bitcoins (equivalent to around 56 million Euro today).

These days many commercial enterprises are starting to accept payment in bitcoins. One of the prime examples is the largest shopping mall in Slovenia, BTC City, which will accept payment in cryptocurrency. All of the stores will be equipped with Eligma Elipay and there will also be a cryptocurrency ATM machine on the premises.
Similarly, on the corporate front they are looking into new ways to utilise cryptocurrencies, such as paying salaries and wages in bitcoins, which is now already possible via Bitwage.co.

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Legal Value

Smart Contracts also have to take the real-world regulatory context into account, since individuals and companies could well dispute the validity of such contracts in court. For this reason, a regulatory framework has to be created within which these automated contracts can operate without infringing other real-world laws. For example, to date, here in Italy the law has not yet been amended to legalise fund raising by means of ICOs (Initial Coin Offering), so it is unsurprising that Italian companies that have chosen to go this route have issued their ICOs abroad, notably in Switzerland and Malta.

This issue can be resolved in one of two ways. The first would be to amend the country's laws to accommodate this new technology, while the other option would be to adopt a system based on private agreements between individuals or some other systems that fall within the current legal requirements. An example of the latter are the notarisation systems aimed at certifying the precise date of occurrence of certain events or deeds. A case in point is Uproov.com, which enables users to save images, sounds or video clips, or Stampd.io, which enables users to prove ownership of digital assets. Guaranteed proof that an event has indeed taken place can now also be provided to a whole range of interested parties in areas such as the tracking of luggage during a trip.

In some cases the applicable regulatory framework may pass through specialised intermediaries who reach agreement amongst themselves to guarantee the efficacy of operations performed on a specific blockchain. This is what happens in the case of We.trade, for example, which enables users to manage international transactions between companies thanks its links with a consortium of banks.

However, when the efficacy of a certain activity relates to matters of State, then specific legislation is required in order to confirm its effects. An example of this occurred in Zug, Switzerland, where they tested a voting system on blockchain to decide how to deal with the issue of fireworks in the town.

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Legal Value:

Legal basis on which blockchain transactions can not be challenged in the real world.

Uproov is a smartphone platform that allows you to instantly notify an image or a video or an audio created by a user via blockchain technology.

We.trade is a platform promoted by 9 international banks that through a blockchain constantly manages, remotely monitor and protect commercial transactions between European companies and the various stages of a sale or supply agreement.

First electronic voting test in Switzerland: municipal votes managed via smartphone thanks to the digital identification system (eID) and certified by blockchain.



The Dark Side of Blockchain

As is the case with every new technology, there is always a dark side, in other words, a number of issues that need to be addressed and resolved because, even if they may not necessarily impact directly on the business, they could in some way hamper its development.

Unnecessary waste of energy

The bitcoin network is 10 times more powerful than the world's 500 supercomputers put together[37]. Blockchain technology requires that transactions be accepted by the network and arranged in blocks. In order to do this, the Proof of Work (PoW) system is used, which entails working on blockchain for at least ten minutes in an attempt to resolve totally random and rather complex mathematical problems in a simple manner (while computers take less time to resolve them, the system increases their complexity) so as to be compensated by the creation of new cryptocurrency.
The bitcoin blockchain currently consumes more energy overall than the whole of Switzerland, however, this notwithstanding, it currently still remains economically viable. It is estimated that, by the end of 2018, the bitcoin blockchain's energy consumption will amount to 7.7 gigawatts and that 80% of the costs of the so-called "miners" (in other words those who resolve these mathematical problems in 10 minutes) derive precisely from their power consumption.
The methods used to power the various types of blockchains vary, but they are all equally burdensome in terms of energy consumption. What we have to ask ourselves these days is therefore how to avoid wasting all this energy and how it could be better used in the interests of society.
The Proof of Activity approach could enable us to identify activities that could resolve some of society's problems while still being sustainable from a business point of view. From this perspective, new syndicated-blockchain infrastructures could emerge that are based on the good of the community rather than simply being an unnecessary waste of energy.
Examples here include companies like Recycle to Coin, which we already mentioned earlier, as well as PlasticBank, which certifies the collection and re cycling of plastic, and Watly, which has plans to certify the water-purification process on blockchain, as well as other companies that could certify certain activities of value to the community, like the planting of trees.

Transaction processing times

One built-in feature of the bitcoin blockchain is the fact that there is a set time limit within which to create a new data block. This significantly increases transaction

[37] Source: Global Bitcoin Computing Power Now 256 Times Faster Than Top 500 Supercomputers, Combined!, Forbes, 2013

processing and data recording times. For this very reason, other blockchains have become specialised in speeding up transaction times.
Metagate is a prime example of this in that it has changed from mining browser into a forging browser. What this means is that the data block is created jointly by the members of the network, who share the commission on the transaction processed between them, and no longer just the sum of all the individual verifications. Another example is Trachechain, which has specialised in approving transactions in less than 3 seconds.

Privacy

The information put into a blockchain remains freely available to everyone forever. The shopkeeper that we pay for a product purchased will be able to see the available balance on our bitcoin account both now and in the future, and may even have access to our purchasing history with other traders or individuals.
This level of transparency obviously raises a number of privacy issues. Precisely to overcome these issues, new systems have been developed for data encryption and the creation of parallel electronic wallets. However, this alone cannot resolve all of the confidentiality problems of blockchain technology and, therefore, the issue of privacy remains a critical one when developing a new service that utilises user data, precisely because the recorded information can never be deleted.

Security

The security of a decentralised system relies on the fact that there is no central server from which to recover things like access codes, for example. If the codes linked to a bitcoin wallet are lost or stolen, there's no such thing as a "password recovery" system.
For our protection, Smart Contract-based decentralised systems have now been developed, for example on Ethereum. Nevertheless, unless we make the necessary provision via Smart Contracts, there simply is no other "parachute". If we transfer bitcoins to the wrong account, there is no feasible way to reverse the transaction.

The inherent security of blockchain is therefore limited to the so-called 51% attack. What this means is that the information could only be changed if more than half of the nodes that make up the blockchain (there are about 9-thousand nodes on bitcoin) agree to do so.

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Identity

A current hot-topic of discussion is the issue of the handling of personal information. The fact that it is impossible to delete any data entered into a blockchain is a prime consideration when deciding what information to put on blockchain. For this reason, the systems that handle the processing of personal information are often designed to prevent external databases from being able to identify the specific individual to whom the information pertains.
But this issue is not always handled in the same manner. Shocard.com uses blockchain to confirm an individual's identity via his/her cellphone before, for example, granting access to offices. The Pisa University enables graduates to permanently record their educational qualifications on blockchain and allows them to add any further qualifications certified by other institutions or employers. The Dubai Government is currently developing a blockchain-registered digital passport system for granting access to the Dubai airport.

The creation of systems for managing personal information is currently a hot topic and in the interim, as we wait patiently for Governments to actively resolve this issue, a number of companies have come up with plans to enable individuals to manage their own personal information. Microsoft is currently evaluating a possible option as part of their Microsoft Authenticator system. ID2020 is a project undertaken by a number of government bodies to enable individuals to manage their own personal information. The United Nations has tried using the Ethereum blockchain to identify and distribute essential supplies to refugees in Syria. Private companies like Uport.me manage decentralised identities via Ethereum. The Known Traveler Digital Identity System (Accenture) enables frequent travellers to share their details with security control departments at airports in order to speed up check-in procedures.

A particular focus area that has emerged in recent times is that of personal medical information. Doc.ai manages individual personal medical files on blockchain and utilises artificial intelligence to predict potential preventable medical issues. Iryo is a system, tested in Slovenia, for managing medical files and for ensuring that a patient's medical history is immediately available for the doctor to view at any time. Guardtime has developed a patient medical record storage system for Estonia on blockchain and a number of other similar systems are currently emerging in the Arab Emirates, such as Patientory, Cryph and MedRec. There are now even projects out there like EnrypGen, which enables users to sell information contained within their own DNA in exchange for cryptocurrency. These projects are based on the concept of the transfer of ownership of personal information.

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IL DOMANI PRENDE FORMA

Nata come spin-off all'interno di **Consulcesi Group**, Consulcesi Tech è oggi **leader nella Blockchain applicata a Eco Mining & Cryptocurrency, Fintech ed Education**. Ciò grazie al suo **Parco Tecnologico per l'Innovazione in Moldavia**, al ruolo di **Lead Advisor per il ConsulCoin Cryptocurrency Fund** e alla formazione di imprenditori e innovatori.

Un impegno che l'ha portata a realizzare, insieme alla Link Campus University, il **master MBA "Blockchain ed Economia delle Criptovalute"**. Un nuovo approccio al tema che fa seguito al successo del **libro "Cripto-Svelate: perché da Blockchain e monete digitali non si torna indietro"**, al centro del dibattito recentemente tenutosi presso il Parlamento Europeo.

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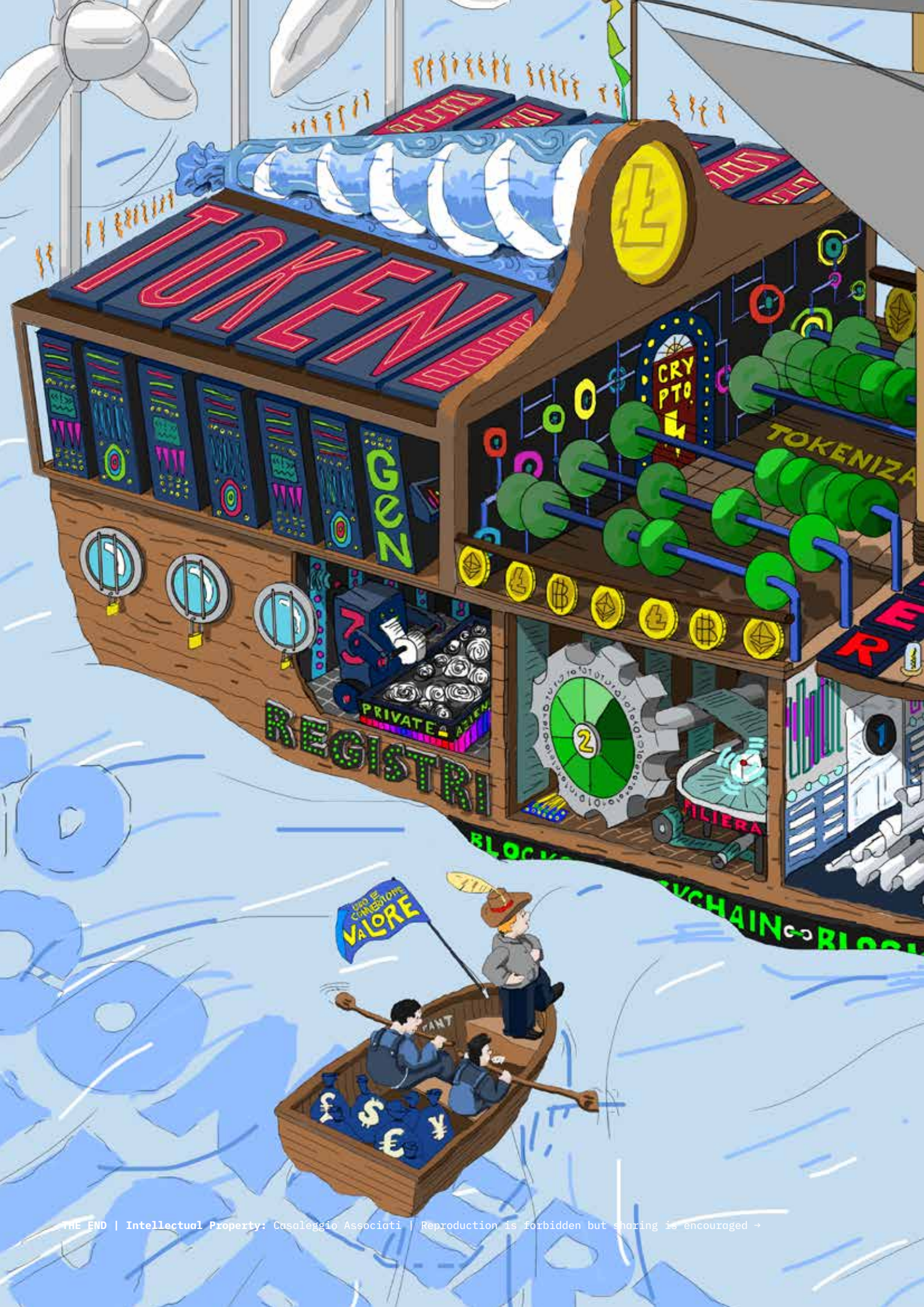
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We wish to thank all the companies that made an active contribution to the drafting of this report and the following in particular.

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