



CIRCLE.ONE

Universal data marketplace

Whitepaper

CIRCLE.one - the data you need, when you want it.

Executive Summary

Our mission at CIRCLE.one is to build a best in class marketplace for research, insights and the data that fuels them. We will simplify the way data and research can be sold, found, funded and bought by at least a factor of 10.

The platform will be powered by CIRCLE.one tokens or Cs in short. Cs are ERC20 tokens running and created on the Qtum blockchain.

The CIRCLE.One token will be used as payment for:

- Commissions (can be paid in Qtum with exchange fees)
- Advertisements on the marketplace
- Service fees
- Preferential support fees

CIRCLE.one creates a virtuous circle by:

- Helping data stream owners find subscribers easily and get paid for their data.
- Incentivising data stream offerings through easy monetization
- Helping analysts find the data streams they need to make their research better
- Making it easy for customers to find the research and insights they are looking for
- Creating more revenue for researchers and data processors
- In turn creating more demand for data streams

Big Data and business decision support are some of the most promising markets of the future. But if "data is the new oil", the most profits will be made on the higher rungs of processing. With the data equivalents to oil's high end chemicals. Insights, research and smartly processed data will be able to command much higher prices and are what truly helps us make better decisions in an increasingly interconnected and complex world. A world that offers opportunities like never before, to those who can detect them.

CIRCLE.one delivers the data you need, when you want it.

This whitepaper aims to inform potential investors about CIRCLE.one's technological and organisational background, the team involved and how to profit from the upcoming ICO.

Since an ICO entails a lot of legal ramifications please make sure to digest the appropriate section in this whitepaper.



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CIRCLE.one Initial Coin Offering

CIRCLE.one will hold an ICO or Initial Coin Offering starting in March 2018 to raise funds for the development and the promotion of our platform.

CIRCLE.one token or C for short is a marketplace coin that will be used to pay for advertisement on our marketplace, commission fees and service fees. This creates token demand in step with growth of our product. The total number of Cs is limited to 500.000.000 tokens. This is the hard cap for the ICO and the maximum number of Cs that will ever be created.

The funds raised will be used for:

- A marketplace with a great user experience and beautiful design - front to back.
- A strong and well communicated brand
- Truly relevant and interesting content
- Signing up important data sources and processing companies and get them selling

We want the world to know about CIRCLE.one's platform and marketplace. Every market depends on liquidity, and CIRCLE.one depends on the number, variety and quality of data on offer, and the information and insights from high quality research companies. This is why we will use a considerable amount of the funds raised during our ICO for marketing. We plan to use as much as 40% here. **Marketing for us is not just about AdWord or banners.** It means:

- Connecting with data sources (like sensor owners), data brokers, and big data companies.
- Helping us understand their needs and wants better.
- Acting as first movers and market makers.
- Signing up research outfits and scientists to CIRCLE.one marketplace
- Promoting the platform on as many channels as necessary

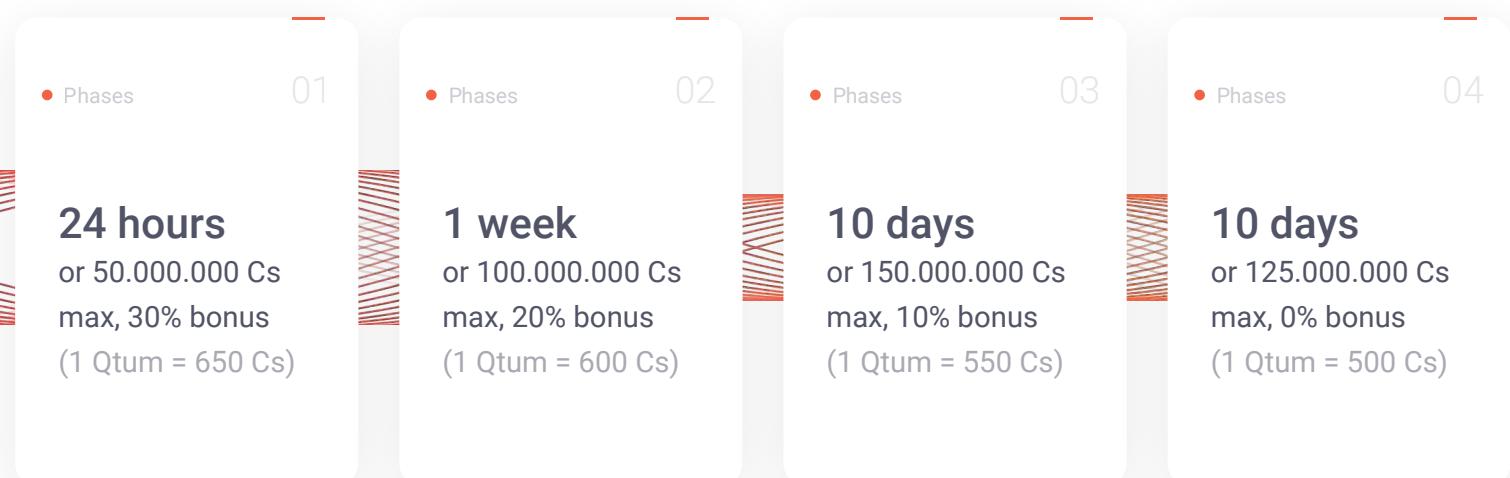
ICO timeline

The ICO will start with private placements beginning on 10th of February, 2018. Private placements are negotiated directly with us and start at 10.000 Qtum. If you are interested in placing an early investment, please contact us at investors@circle.one. We offer substantial bonuses at that stage, so if this is for you, you might want to reach out to us before 1st of March, 2018. A maximum of 75.000.000 Cs will be placed here.

CIRCLE.one tokens have a 500.000.000 Cs hard cap. There will never be more than 500.000.000 tokens. The soft cap for the ICO is at 140.000.000 Cs sold. If this threshold should not be reached, investors can reclaim their Qtum at the original exchange rate.

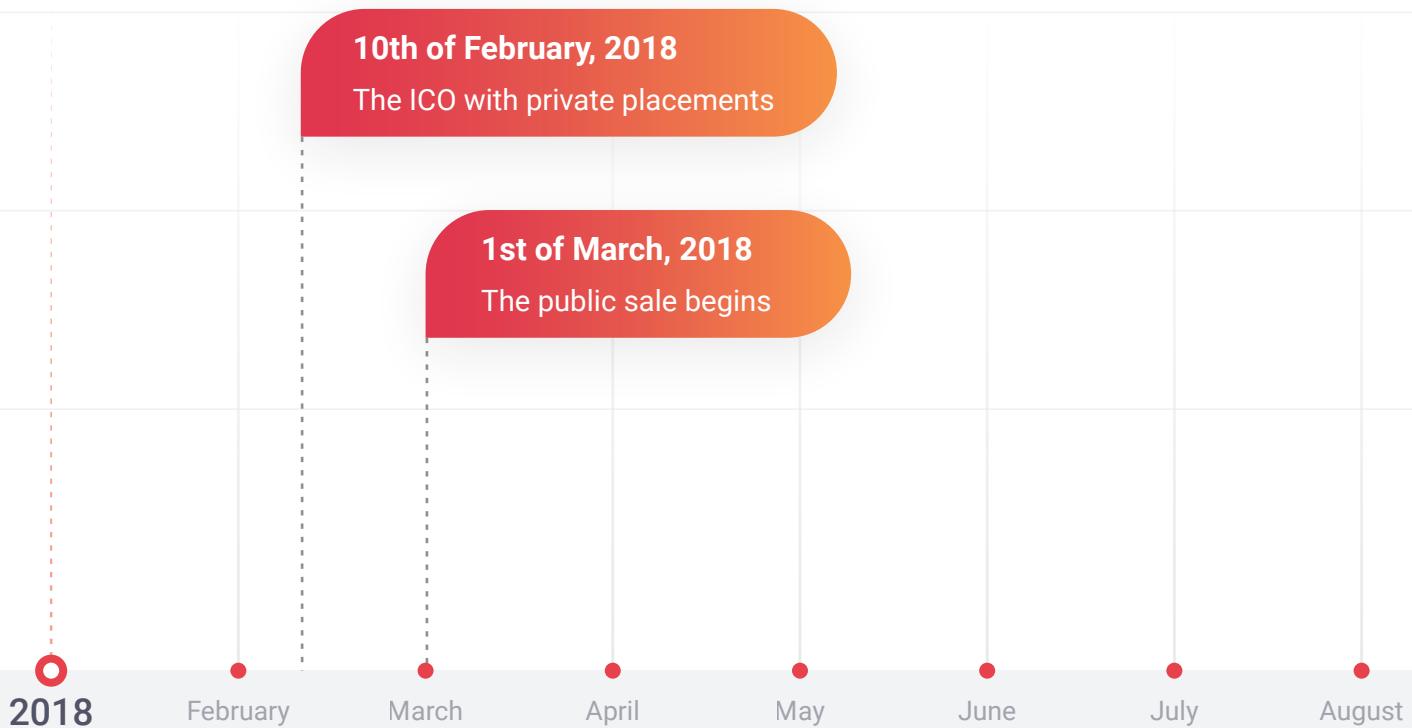
1 C will be valued at 0,002 Qtum during the ICO (1 Qtum = 500 Cs).

The public sale begins on the 1st of March, 2018, and offers 4 bonus stages, that end either at a certain time, or when a threshold of tokens is reached.



After the ICO ends we will focus on developing software, brand and acceptance. This will take 6 months till a public beta can be released and 12-18 months till the marketplace can go live.

Research companies and data brokers will be approached to sign up beforehand. We will also use marketing to get our brand known and accepted with data source owners.



● The economics of investing in CIRCLE.one

The research market had a turnover of \$136 billion in 2017, the big data and analytics market is forecasted to reach \$187 billion in 2019, as we will explain below in the chapter about market demand. If CIRCLE.one is able to capture just 1% of these markets by 2020 its turnover would be upwards of \$3,2 billion. That would mean at least \$128 million in commission fees (4% commission on \$3,2 billion in sales), if only the reduced commission fee is calculated that vendors can pay with CIRCLE.one tokens.

We expect advertising to be a substantial part of our total revenue. Ads can be targeted to specific searches, ensuring relevance. Our customers are likely to be on the lookout for interesting products in their field of study and will be able to spend significantly when they find something that moves their needle. We expect advertisement revenue to be at least equal to commission fees.

CIRCLE.one tokens would then have an annual turnover of the equivalent to \$256 million by 2020. If standard valuations used for stocks are applied here, the value of 1 C can be calculated to between \$3 to \$15, depending on the multiple that is applied. Certainly a big way up from \$0.057 during the ICO. (Qtum price of 2/2/18).

● What you won't get by participating in the ICO

Participating in our ICO will not get you a vote in the development of CIRCLE.one business. Every CIRCLE.one token holder will participate in the economic success of our ecosystem and we will provide feedback mechanisms in the form of chat channels and forums that token holders have exclusive access to. The idea here is that a lot of smart people will be holding tokens, and if they wish to share their insights and ideas, we wouldn't want to waste this valuable asset.

However, CIRCLE.one is an enterprise, and is run by a capable and experienced management team. Decisions need to be made, often under severe time constraints. The responsibility for the ultimate success of the enterprise rests with the executive board.

CIRCLE.one wants to move and implement quickly. This prohibits a democratic decision making process with thousands of investors.

We are using this chapter to make this explicit and clear. Invest in CIRCLE.one by purchasing our tokens only if you feel our vision has merit and you trust us to execute and deliver.

● What you will get by participating in the ICO

The research and data market are each enormous in their own right, as we'll demonstrate in the chapter about market demand in this whitepaper. CIRCLE.one combines and augments both markets meaningfully.

Token holders will profit:

- When the token value appreciates as the platform grows.
- When paying fees on transactions (4% commission instead of 7,5%) or for ads.
- When operating a master node (see later)

One or all of the points above could prove interesting to an investor.

Buy and Hold investors who want to participate in the rapid growth of an enterprise will hold tokens and profit from appreciation as demand grows.

Persons or institutions interested in data can use the substantial initial discount available during the ICO to buy data later on.

Operating a master node can be very profitable, if the connection quality is high and the node's capacity well gauged.

Market Demand

How do we know about the world around us? We need data. Some is provided by our senses, some we have to extract by measuring and probing. Data shapes our view of the world. Data helps us make decisions and gain insights into their results. Leading a successful business today without the right data is impossible. The demand for analytics and research will only increase over time as more and more processes become automated and businesses become more complex.

Complex business decisions need more, better, and more intelligently processed data and analytics. Currently users have to scour many sources until they find what they are looking for.

The same for sensors: Companies like Libelium¹ and Adafruit² produce very affordable sensors, most of which are modular, connect in a myriad of smart ways and sell better every year. These sensors are called IoT (Internet of Things) sensors because they ultimately connect to the Internet.

¹ <https://www.libelium.com/>

² <https://www.adafruit.com/category/35>

Most of their data could be made available to interested buyers, but currently there is no one place where buyers can find data, research or analytics they might be interested in. IOTA has announced to launch a marketplace for raw sensor data and released an alpha build with limited functionality³. Repux.io has announced an ICO for a protocol that bridges data sources and machine learning networks⁴.

Lack of a marketplace for data and insights has grave real world implications. Here is an extreme example: sparse weather data leads to widespread famine in Africa⁵. A broader market for sensor data, would lead to a better data supply. But right now data is stored in silos within companies. Even neighboring sensor owners or data producers sometimes have little incentive to share sensor data.

Analysts offer their insights and research on their own company's website, with a plethora of different user interfaces and buying mechanisms a user has to contend with. This makes finding the insights you're looking for a time consuming and unreliable process.

Limited access to data sources results in limited analytics. More data means better results. Limited analytics mean less business. This in turn limits the resources analysts can allocate toward their research, making products even worse. In short: the market could be a lot more interesting and profitable if there was a way vendors and buyers could meet with ease.



9 billion IoT sensors
worldwide

Sensor readings are transmitted
over mobile, LoRa, Sigfox... networks

and locked away forever in data silos
and walled gardens... all 600 billion
dollars worth. per year

³ <https://datum.iota.org/>

⁴ <https://repux.io/>

⁵ <http://www.bbc.co.uk/news/business-41967241>

Research faces its own set of problems. Periodic journals are the principal means of publishing, and have been since the 17th century. Since the number of papers published has become the measure by which academic success is established, journals have become the gatekeepers they never should have been, explains an article in the Economist⁶ last year.

Students and fellow scientist often do not find the information they're looking for. And research quality suffers a result. Sometimes more energy is invested in making sure a paper is published in the right journal, instead for increasing the quality of research. This leads to higher retraction rates at the same statistical quality for top-name journals⁷.

Enter CIRCLE.one



⁶ <https://www.economist.com/blogs/economist-explains/2017/03/economist-explains-23>

⁷ <http://curt-rice.com/2013/02/06/why-you-cant-trust-research-3-problems-with-the-quality-of-science/>

CIRCLE.one creates a marketplace for research and for data that fuels it. This means it gets easier for data owners to sell, leading to more supply. More supply would lead to better research. Better research needs a great marketplace to be effectively sold. With CIRCLE.one, good research will sell, leading to more demand for data. And so a virtuous CIRCLE is formed.

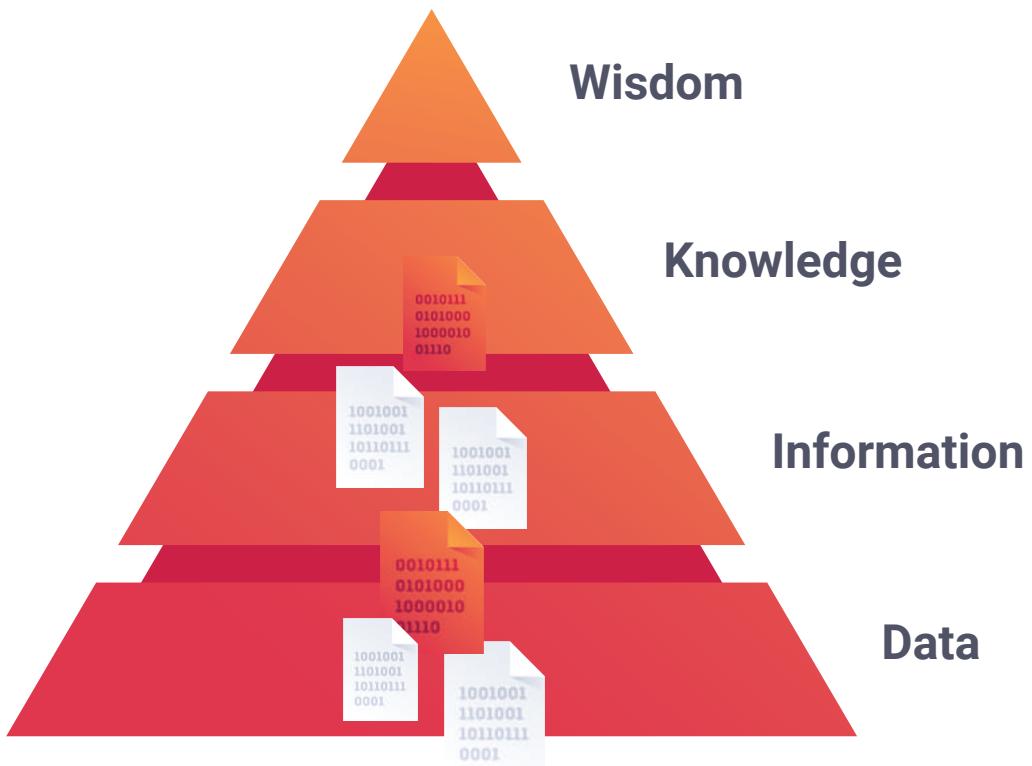
CIRCLE.one will create a user friendly, visually attractive marketplace as a web and mobile application. We are developing a great search engine that will help users quickly and consistently find the data or insights they are looking for.

Services, not raw materials

While raw data is a huge market in its own right, data streams will be the commodities and raw materials that will be used to offer informations and knowledge.

CIRCLE.one will focus on the higher tiers of the data value creation pyramid and will aim to capture the higher margins and prices available there.

DIKW Pyramid:



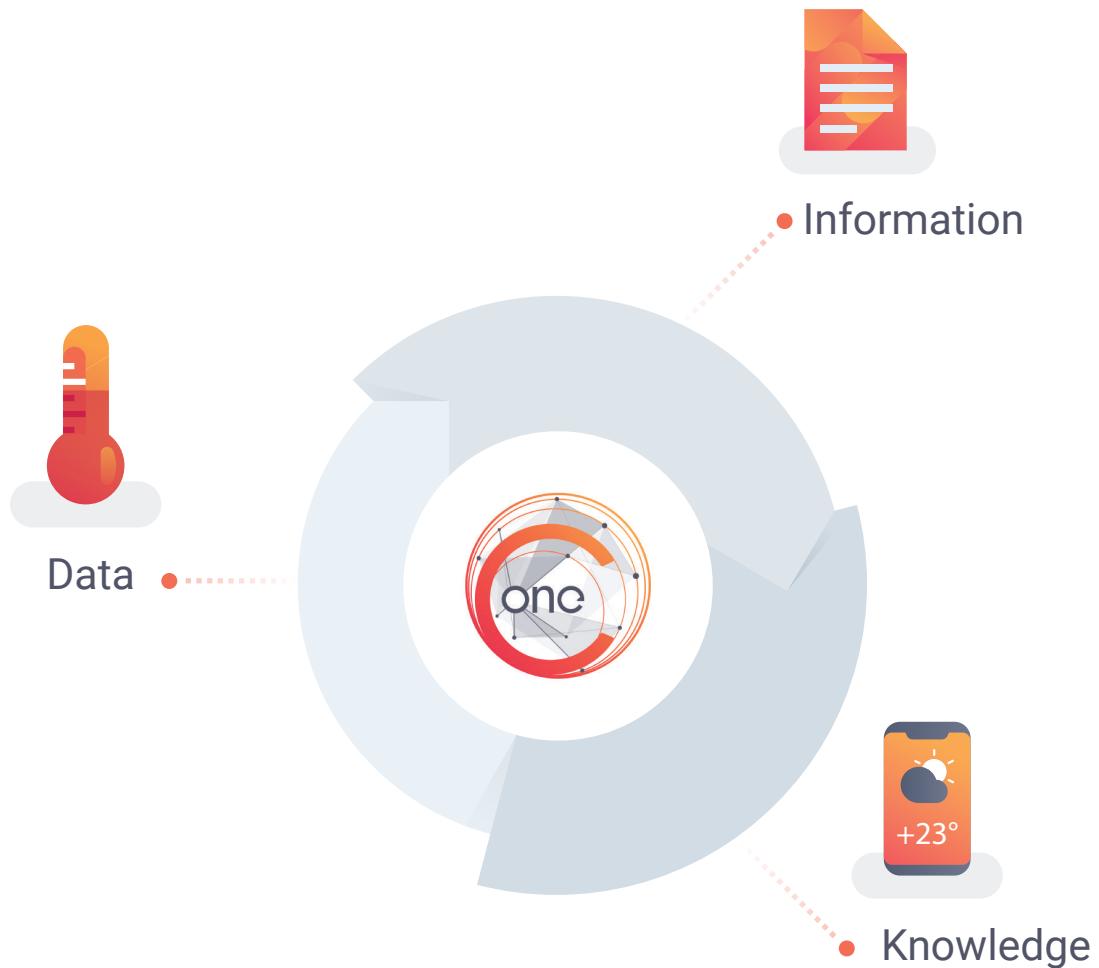
While raw data is a huge market in its own right, data streams will be the commodities and raw materials that will be used to offer informations and knowledge.

CIRCLE.one will focus on the higher tiers of the data value creation pyramid and will aim to capture the higher margins and prices available there.

Research can be independently published on the marketplace, and will find customers, if the quality is right, and good reviews and recommendations help to raise its visibility on our search engine.

CIRCLE.one joins efforts like Google Scholar to promote true openness in research.

Unlike with Google Scholar researchers can directly profit from putting their efforts on our marketplace. Without any intermediaries or gatekeepers.







Big data and the future of business decision making

A 2016 IDC forecast suggests that big data and analytics sales will reach \$187 Billion by 2019⁸, up 50% from 2015. Even this still leaves the majority of data sources without commercial use. PwC estimated that commercializing financial data could be a \$300 Billion market by 2018⁹. This is further supported by a Capgemini¹⁰ study, that found 61% of respondents state that big data creates and drives revenue by itself. 43% of more than 2000 C-level executives polled report that ***they have or are currently reorganizing in order to exploit new big data opportunities.***

While 54% of respondents say their big data investments over the next three years will outstrip past investment.

Now imagine what that market could look like of data and the results derived could be easily traded. The potential here is very hard to estimate, since the underlying network effects could lead to exponential growth, as increased demand leads to better and more supply and better results from analysts and researchers.

Executives and decision makers want to operate on the most accurate models of their business. When data truly helps to make big decisions, the prices that can be commanded are not limited.

CIRCLE.one is well positioned to help Big Data scale commercially.

IoT and data from sensors and connected devices

The Internet of Things has received an astounding amount of press over the last few years. Some was pure hype, like wild expectations of self organising machines, interlaced with some real world examples, and plain cool stuff. From smart agriculture and precision farming, to self-organising cars, or refrigerators that make sure you never run out of soda. IoT seems destined to be the next big thing. Data plays a vital role here. Data enables devices to act on the real-world. The refrigerator in the example above, realising it's time to order soda. The soil sensor, showing it's the ideal time to start planting.

But just how big will the market be? A study by McKinsey¹¹ from 2015 estimates the potential economic impact—including consumer surplus— as high as \$11.1 trillion by 2025 for IoT applications

⁸ [https://www.informationweek.com/big-data/big-data-analytics/big-data-analytics-sales-will-reach-\\$187-billion-by-2019/d/d-id/1325631](https://www.informationweek.com/big-data/big-data-analytics/big-data-analytics-sales-will-reach-$187-billion-by-2019/d/d-id/1325631)

⁹ <https://sloanreview.mit.edu/article/whats-your-data-worth/>

¹⁰ https://www.capgemini.com/wp-content/uploads/2017/07/big_fast_data_the_rise_of_insight-driven_business-report.pdf

¹¹ <https://www.mckinsey.com/business-functions/digital-mckinsey/our-insights/the-internet-of-things-the-value-of-digitizing-the-physical-world>

Data is just a small piece of this pie. But a piece that has not yet been adequately commercialized. The same study finds: *Most IoT data are not used currently. For example, only 1 percent of data from an oil rig with 30,000 sensors is examined.* The data that are used today are mostly for anomaly detection and control, not optimization and prediction, which provide the greatest value. And of the data that are actually used—for example, in manufacturing automation systems on factory floors—most are used only for real-time control or anomaly detection. A great deal of additional value remains to be captured, by using more data, as well as deploying more sophisticated IoT applications, such as using performance data for predictive maintenance or to analyze workflows to optimize operating efficiency. Indeed, IoT can be a key source of big data that can be analyzed to capture value, and **open data**, which can be **used by more than one entity**¹².

So what is the Internet of Things, anyway?

We define the *Internet of Things* as sensors and actuators connected by networks to computing systems. These systems can monitor or manage the health and actions of connected objects and machines. Connected sensors can also monitor the **natural world, people, and animals**¹³.

Not all of the sensors involved in this definition are interesting to potential buyers. A sensor that controls the temperature in a company's cafeteria is hard to sell. Some sensors will record sensitive information and should be private. (CIRCLE.one enables a data owner to make data available only to addresses he whitelists.)

A study by IDC from February 2016¹⁴ estimates the IOT market to be worth \$1.3 trillion in 2019. Verizon estimated a compounding growth of 17% year over year for the IoT market as a whole, with the market producing 592 billion USD in volume in 2014.

¹² Big data: The next frontier for innovation, competition, and productivity, McKinsey Global Institute, May 2011

¹³ From the McKinsey study

¹⁴ IDC, Worldwide Internet of Things Forecast Update: 2015 – 2019, February 2016

Research market overview

The market for scientific research & development was valued at 136 billion USD in 2017, and grew 2,7% year over year for the past 5 years, according to a study carried out by IBISWorld¹⁵.

The main source of funding for research was government stimulus, although these levels dropped in last years, due to austerity measures. Private funding could step in and keep the market growing. More than half of the total market revenue happened in Europe (\$90 billion)¹⁶.

Research that is published in journals is usually kept behind paywalls. Since every publisher has implemented a different approach to payment, researches often need tens of accounts on different websites to get to the information they need.

Since the number of papers published has become the measure by which academic success is established, journals have become the gatekeepers they never should have been, explains an article in the Economist¹⁷ last year.

As a result research quality suffers, as more energy is used to get a paper published in the right journal, instead for increasing the quality of research. This leads to higher retraction rates at the same statistical quality for top-name journals¹⁸.

¹⁵ <https://www.ibisworld.com/industry-trends/market-research-reports/professional-scientific-technical-services/professional-scientific-technical-services/scientific-research-development.html>

¹⁶ <https://www.prnewswire.com/news-releases/scientific-research-and-development-services-global-market-analytics-2016-300359488.html>

¹⁷ <https://www.economist.com/blogs/economist-explains/2017/03/economist-explains-23>

¹⁸ <http://curt-rice.com/2013/02/06/why-you-cant-trust-research-3-problems-with-the-quality-of-science/>



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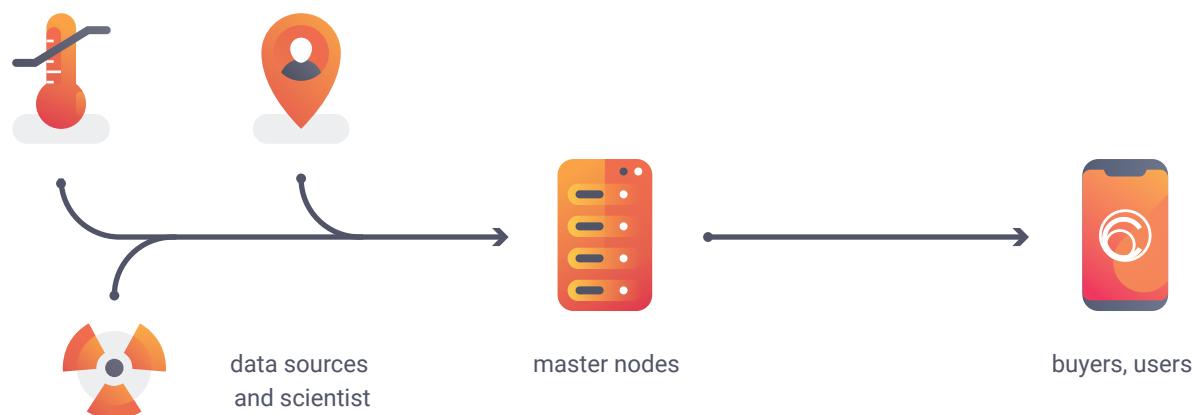
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CIRCLE.one platform and product

The CIRCLE.one platform has four main layers:

- CIRCLE protocol (core) layer, that defines the rules, syntax, semantics and synchronization of its components plus communication and possible error recovery methods for payments.
- CIRCLE transmission layer, governs the transmission of data streams or information purchased.
- CIRCLE search layer, helping customers find relevant data.
- CIRCLE marketplace layer, a peer to peer marketplace for data and insights.

CIRCLE.one protocol layer



CIRCLE.one uses master nodes to establish a decentralised network. Master Nodes cache data streams and research so buyers can have instant access to their purchases. Caches also help when the data source has low connection bandwidth, but lots of subscribers.

CIRCLE.one encourages users to set up master nodes and earn from making their infrastructure available. Master node's need fast internet access with good upload speeds and a state-of-the-art server. The exact specifications will be updated regularly and can be found on our website. Master node operators also need to hold at least **100,000 Cs per master node**. This provides further incentive to keep their nodes in the best shape possible. Good master nodes equal a well performing marketplace, so more profits.

Master nodes generate income from transaction fees. Each user connects to at least one master node. When a user purchases information on the marketplace, this request is handled by the first master node in its connection list. If this master node has no capacity or doesn't store the requested information, the request is forwarded to either the next master node, in the case of limited capacity, or a request for information is transmitted on the network to find a master node, that has cached the desired data.

CIRCLE.one charges a 7,5% transaction fee, 4% if paid with Cs. These transaction fees are earned by whichever master node performs the delivery. Another great reason for master node owners to keep them operational and well connected.

If a vendor has Cs stored the amount of Cs equal to 4% of the purchase price is deducted from that and sent to the master node owner. If he does not have our tokens. 7,5% of the purchase price in Qtum is deducted. For vendors holding Cs is a great way to keep transaction fees low.

The Qtum cryptocurrency is used as a means of payment. Qtum has a very high transaction bandwidth plus low fees and a relatively stable price. It also offers smart contracts.

Qtum transaction costs are currently at ~0,0006 USD per transaction. This is about 0,1% of what we think the average data subscription can charge for one day. While far from frictionless Qtum has a high transaction bandwidth and its team is striving for constant improvement.

Thanks to smart contracts fulfillment is automated and requires no action on the part of the vendor. Once funds are received, the subscription is activated or the paper transmitted autonomously. The gas necessary to execute this smart contract is paid for by the vendor, and deducted from the amount of Qtum received.

Users can leave reviews for every purchase they made exactly once. These are stored on chain, and take the form of a score between 0 and 100. 100 means a perfect transaction and 0 that the transaction fraudulent or the data delivered had no connection to the data advertised. The gas necessary to store reviews on the Qtum blockchain are paid for by the vendor. This fee amounts to fractions of a cent, at current Qtum price levels but should not be paid by the buyer.

CIRCLE.one supports any data format or document format for delivery. We will instruct and advise users to publish the format their data or research is delivered in. A vendor could offer two data streams from the same source, that publish the same data in two different formats to increase his audience. Data purchased on CIRCLE.one's marketplace is always tagged with the current time plus the location of the data source if applicable and signed with a source's private key. When a user adds a new source to its portfolio a public/private key pair is created for this source, but derived from the users master key. This is done the exact same way that HD wallets work¹⁹.

Research is also digested with a SHA-512 message digest, signed with a sources' private key and then encrypted with the buyer's public key. This ensures that the same research cannot be publicized as a newer version without at least some modification, and that another source cannot pass the same research as a different research. Signing with a source's private key also proves who the research was sold by.

By encrypting it with a buyer's public key, the research cannot be pirated by a user, except when a user is willing to publicly share his private keys as well.

¹⁹ https://en.bitcoin.it/wiki/Deterministic_wallet

● CIRCLE.one platform and product

Data streams are cached on BigChainDB via our master nodes. BigChainDB offers great scalability, lightning fast transactions and at the same time incorporates blockchain features like immutability and consensus building.

Caching data means a buyer can have instant access to any information on the CIRCLE.one network, even if the vendor is offline.

Research is either stored in BigChainDB or on IPFS. The buyer can immediately access his purchase after payment, thanks to smart contracts and Qtums short block times.

When a buyer connects to a master node, and the purchase can be fulfilled, the master node then opens a transmission channel to the user and pushes the data to the buyer.

● CIRCLE.one search layer

When the world wide web was in its infancy, finding the webpage that contained information you were looking for was hard. Yahoo came and eased the process by categorising and curating websites on its portal. Later Altavista delivered search results that were at least 10x better than Yahoos. Then came Google, and the rest is history.

Finding data sources and insights that deliver what a buyer is looking for is crucial for the success of CIRCLE.ones marketplace. **If you can find an insight quicker by using Google search and paying on the provider's own website than by searching on our marketplace users will stop using CIRCLE.one.**

We will constantly refine our search algorithm to help users find exactly the piece of information they are looking for.

● CIRCLE.one marketplace layer

CIRCLE.one marketplace app will have 3 main modules:

- Data
- Information
- Knowledge

This is the place where data buyers, data vendors, analysts, research companies and scientists meet to do business. We have already invested a lot of time, effort and money into developing a world-class user experience and visual interface.

All prices listed here will be for a subscription to the data offered for 24 hours or a single purchase of the insight. Longer periods are calculated with multiples. 1 week means times five, one months times fourteen, and one year time 120.

Data will list individual sources offering their data streams with a short description: what is measured, how often it is measured, its location, quality score and price per day.

For example:

Mission S-Park #2367 | CO2 | hourly | 3280, 17th St. 94110 S. Francisco | 85% | 2,65Cs

This would mean that the Mission Sensor Park Company (fictional) has sensor number 2367 placed on the building at 3280, 17th Street in the Mission district in San Francisco, CA. The sensor records the CO2 level once per hour. Users give the sensor an 85% quality rating and the data stream costs 2,65 Cs per day.

| Name | Verified | Type | Frequency | Price/Hour |
|--|------------|-------------|------------|---------------------|
| CO2 sensor on bPost truck I-KOA-794 | ✓ Verified | CO2 | Per second | € 0.63 (± 0.0028) |
| CO2 sensor on bPost truck I-ZFT-748 | ✓ Verified | CO2 | Per second | € 0.49 (± 0.0022) |
| CO2 sensor on bPost truck I-CHB-450 | ✓ Verified | CO2 | Per second | € 0.60 (± 0.0027) |
| Temperature sensor in container CARU-177691-4 | | Temperature | Per minute | € 0.42 (± 0.0018) |
| Temperature sensor in container FBIU-B158796-9 | | Temperature | Per minute | € 0.42 (± 0.0018) |
| Temperature sensor in container GRCU-I810207-2 | | Temperature | Per minute | € 0.55 (± 0.0025) |
| methether | ✓ Verified | methetherum | hourly | € 223.87 (± 1.0000) |

When a user selects one particular data source, an overview of is displayed. Please see the description of the data source page below for more information. Here the user can discover more detailed information about the source and purchase its data stream if he likes what he sees.

Information will list information derived from data. Each information for sale will be listed with the name of the service, which information is offered, at what frequency it is updated, the location (if applicable), a score and a price.

Mission district CO2 avg. | CO2 median of 120 sensors | hourly | San Francisco, CA, USA | 95% | 25 Cs.

This would mean that a user could buy an hourly updated median of 120 CO2 sensors in the mission district for 25Cs. 95% of users think this information is accurate and relevant.

| Name | Verified | Type | Frequency | Price/Hour |
|--|------------|-------------|------------|---------------------|
| CO2 sensor on bPost truck I-KOA-794 | ✓ Verified | CO2 | Per second | € 0.63 (± 0.0028) |
| CO2 sensor on bPost truck I-ZFT-748 | ✓ Verified | CO2 | Per second | € 0.49 (± 0.0022) |
| CO2 sensor on bPost truck I-CHB-450 | ✓ Verified | CO2 | Per second | € 0.60 (± 0.0027) |
| Temperature sensor in container CARU-177691-4 | | Temperature | Per minute | € 0.42 (± 0.0019) |
| Temperature sensor in container FBII-8158796-9 | | Temperature | Per minute | € 0.42 (± 0.0019) |
| Temperature sensor in container GRCU-1810207-2 | | Temperature | Per minute | € 0.55 (± 0.0025) |
| mether | ✓ Verified | methereum | hourly | € 223.87 (± 1.0000) |

Information means data is already processed to some extent, to extract meaning or to reduce noise inherent in the raw data streams. This could be averages, medians, smoothing functions like moving averages or wavelets. Anything that could help a potential buyer get more out of the raw data. Clicking on a listing, a user is shown more details about the information offered and the processing employed. The information can be purchased straight from this window.

Knowledge will display smarter and more intricate data extraction and information processing. Here data processing labs, research outfits and data scientist or data journalists can offer their services. The listing will contain a name for the research sold, a short description, a score, and the cost.

For example: The Mission Sensor Park company sells a map of the Mission district that shows CO2 levels over time. The entry for this would read:

Mission Sensor Park | CO2 street-map over time (last yr) | 95% | 103 Cs

Again, clicking on a model shows more details and allows the user to purchase.

There are no limits to what can be offered here. **This is a research marketplace**, and most research is more complex processing of data. Insights are found, and presented, complex connections formed. This module is what the most customers are likely to use, while analysts will also want to buy data and information.

CIRCLEone

CO2 sensor on bPost truck I-KOA-794

Detailed information

| | |
|------------|--------------------------------------|
| Name: | CO2 sensor on bPost truck I-KOA-794. |
| verified: | Yes |
| Type: | CO2 |
| frequency: | Per second |

Price per hour

€ 0.63
Ξ 0.0028

PURCHASE ACCESS

Sensor readings

Latest sensor readings items

| Timestamp | Sensor reading |
|-------------------|--|
| a few seconds ago | [{"containerId": "bpost-co2-100", "macAddress": "208784C003333009"}] |
| a few seconds ago | [{"containerId": "bpost-co2-100", "macAddress": "208784C003333009"}] |
| a few seconds ago | [{"containerId": "bpost-co2-100", "macAddress": "208784C003333009"}] |
| a few seconds ago | [{"containerId": "bpost-co2-100", "macAddress": "208784C003333009"}] |
| a few seconds ago | [{"containerId": "bpost-co2-100", "macAddress": "208784C003333009"}] |

Ethereum

| | |
|-----------|--------------------|
| Account: | 0x02b6388855b01... |
| Contract: | 0x0f05512e3b609... |
| height: | 666537 |
| Mined: | a few seconds ago |
| network: | rinkeby |

Multichain

| | |
|---------|--------|
| height: | 172578 |
|---------|--------|

You might have noticed the inclusion of a score in each of the listings. We want users to give vendors feedback on their offers. First, because honest feedback allows a vendor to improve their offer, and second because it allows buyers to purchase with trust. We will get to the mechanics of trust and reputation in a later chapter of this whitepaper.

CIRCLE.one wallet application

Our wallet will be a web and mobile app. Here users can see how many tokens (Cs) and Qtum they own, and how much they earned from subscribers to the data or research they offer at a single glance.

Wallet main screen

The main screen affords an overview of a user's account. Cs owned, Qtum owned, last transactions, which products are offered, links to shops, and how much profit these generate.

There'll be a chat to communicate directly with other CIRCLE.one users from within the wallet.

A user can add additional products to his portfolio right from the wallet, and look into the data his sources produce on their details tab, if he offers data streams.

Clicking on the Cs or Qtum in his wallet, a user is directed to his **account** history. Here she can see what she paid for and who paid her. She can send or receive Cs or Qtum, or go to the exchange bot to buy Cs and Qtum by using other currencies.

Shops

A user can choose to create a shop within the CIRCLE.one marketplace. A shop has a customisable branding but otherwise offers the same clean interface as the main marketplace. Vendors can list their products here, and set the categories these products fit in. With a shop, vendors can invite users to take a look at the whole palette they're offering. Shops can also be promoted to bring in more customers, and are accessible via a deep link that can be used with ad platforms or for sharing. A shop will cost a small fee per month. This fee is payable in Cs, CIRCLE.ones marketplace token.

The screenshot shows the CIRCLE.one marketplace dashboard. On the left, there's a sidebar with navigation links: Dashboard, Streams, Datasets, My streams, Packages, Admin stats, and Logout. Below that is an Ethereum section showing account details: Account (0x8E8E8E8E8E8E8E8E8E8E8E8E8E8E8E8E), Balance (0.00000000 ETH), Height (608628), and Used (a few seconds ago). The main content area has three main sections: News, Balance, and My purchased datastreams. The News section contains three entries with placeholder text. The Balance section shows a balance of € 4893.74 and 21.7480 tokens. The My purchased datastreams section lists two items: "CO2 sensor in bread truck I-KOA-784" (CO2, Per second, a month ago) and "Temperature sensor in container CARU-I77691-4" (Temperature, Per result, a month ago). There's also a link to "GO TO THE RINKBY FAUCET FOR TEST ETH".

Advertisements

"Early to bed and early to rise, work hard and advertise!" was the motto of many a successful entrepreneur. Vendors can advertise their offerings on the CIRCLE.one marketplace. Advertised offerings will receive high visibility on our search page and vendors can also book promoted listings that will come up higher when users browse lists of offerings. These advertisements will allow vendors to tag specific search terms to their offerings, and allocate a budget they wish to spend per ad clicked. Very much like Facebook or Google Ads work at the moment.

Advertisements can only be paid with CIRCLE.one tokens (Cs). For outside companies that don't hold any tokens, this means either going through our fiat to Cs exchange or purchasing them from another user.

Trust and Reputation on the marketplace

When companies use data they produce themselves trust is a non-issue. When purchasing from a total stranger things become a lot more interesting. How do you know the data is not fabricated? How do you know you're not getting data from a computer simulation? How do you know you're not being fed historical data instead of actual events? How can you be sure a sensor's owner for instance didn't manipulate the sensor or tamper with its configuration?

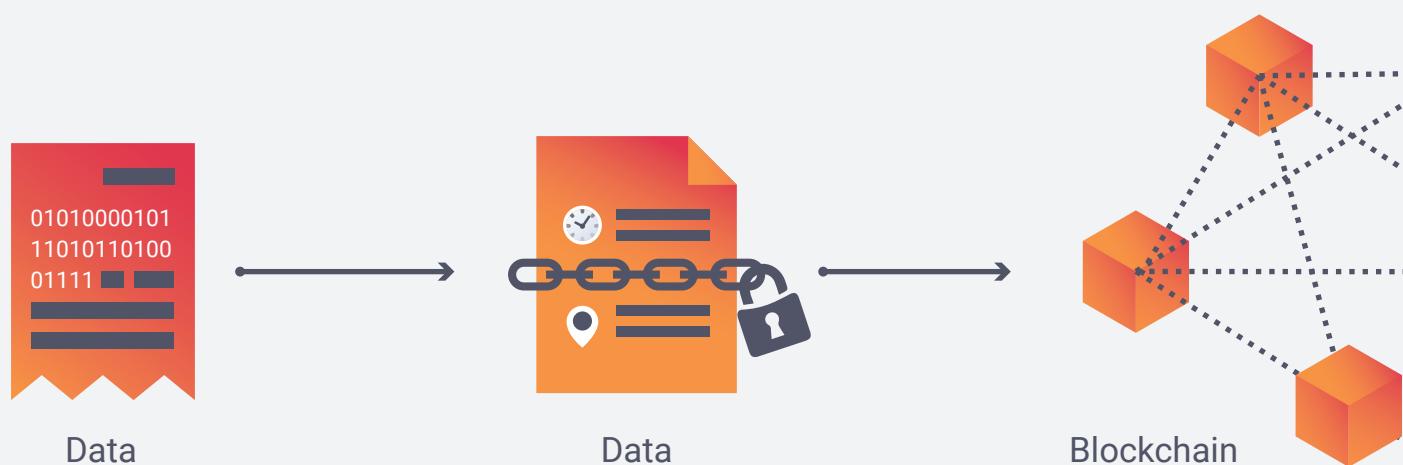
What kind of seriousness and quality can you expect from an analyst or research company?

We developed three solutions:

1. Signing data streams with the time of creation and the owners private key and linking them to a blockchain.
2. Signing the product with a timestamp, to proof actuality or that a newer version is in fact newer.
3. Allowing data buyers to rank the quality of data or of the research purchased.

The first and second approach are technical solutions to the questions above, and we'll outline how this is implemented in CIRCLE.one.

The third approach adds a social dimension to the trust issue. Just as sites like TripAdvisor or **Yelp help users find restaurants they like, we aim to allow buyers to make an informed judgment about the quality of data they're willing to purchase.**



Signing and securing data on the blockchain

Data purchased on CIRCLE.one's marketplace is always tagged with the current time plus the location of the data source if applicable and signed with a source's private key. When a user adds a new source to its portfolio a public/private key pair is created for this source, but derived from the users master key. This is done the exact same way that HD wallets²⁰ work.

The usage of blockchain technology enables buyers to be sure data is fed into the system at the time advertised and at the location advertised.

Vendor reputation

Despite all our technical efforts at making sure buyers get what is advertised, a crafty vendor could fabricate data and then feed it into our system with a valid timestamp and location. Another - much more mundane - example would be simple neglect of data sources. For example a CO2 sensor, installed on top of a factory two years ago, is stained by soot and dirt by now and not reading correctly. But its parameters read okay. The sensor has power. The location didn't change. It wasn't tampered. Just neglected.

This is where ratings come in. We want buyers to be able to rate the offers they purchase on a scale of 0 to 100. A 100 would mean the buyers find data extremely useful and accurate. A 0 would mean that data is totally unreliable or erroneous. Buyers can rate sources whenever they purchase their data stream and an insight whenever it is purchased.

The ratings are then averaged and displayed in the Data tab on the marketplace as well as in individual listings.

Does using a blockchain make sense here?

CIRCLE.one relies on blockchain technology to:

1. Facilitate payments
2. To proof data
3. For automated fulfillment
4. Commission payments
5. Advertisement payments
6. Service fee payments.

²⁰ https://en.bitcoin.it/wiki/Deterministic_wallet

Blockchains have some amazing strengths. By far the most prominent and important of these is the mechanism to arrive at a consensus and immutably store the result. Not by invoking a central authority, but by relying on strict and well formed rules for consensus building, and by making it infeasible to alter past transactions. The second strength is their distributed, decentralised nature that make blockchains extremely resilient against attacks and very hard to destroy completely.

Blockchains also have severe weaknesses. Number one here is performance. **Most blockchains take at least double digit seconds to conduct and confirm a transaction, while at the same time occupying ridiculous computing power resources by forcing all members of a network to do the same work, so they can vote on consensus. Sometimes a blockchain can be just a database, with bad performance.**

CIRCLE.one uses the Qtum²¹ blockchain in two ways. One for payments, by using Qtum as a currency. Two, by employing a ERC20 token called CIRCLE.one token and abbreviated to C. Cs are also what investors can purchase during our ICO.

Paying for data streams was one the most compelling reason to use public ledger technology. The micropayments involved in selling and buying a single data stream even exclude some cryptocurrencies. Bitcoin's lightning network²² or Ethereum's Raiden network²³ could here, if and when they are rolled out successfully. We chose QTum for it's abstraction of the underlying blockchain and relatively high transaction bandwidth, combined with low transaction fees.

Qtum payments have the additional advantage of not being nominated in a national currency. This helps users avoid cross currency risk and exchange fees.

The second reason was that blockchains, as Satoshi Nakamoto first demonstrated with Bitcoin, really do solve the problem of trust between parties that are complete strangers and cannot invoke central authorities to settle disputes. The CIRCLE.one protocol signs data streams with their associated private key, after it has been timestamped and the location of origin attached, if available. The private key is unique to the owner of a data stream and can only be controlled by him. That way, data streams can be linked to their origin on the blockchain.

Third, smart contracts allow automatic fulfillment of purchases. Even if the company launching CIRCLE.one should cease to exist, the underlying purchases would still be fulfilled.

Qtum are also needed to fund smart contract execution. Selling a subscription to a single data stream should need no special negotiations. Here smart contracts for automated fulfillments come in very handy. Smart contracts require the owner to pay a small fee in the form of "Gas". This Gas can be purchased with Qtum. Of course this process is fully automated, as long as the owner has enough Qtum to supply the Gas needed²⁴.

CIRCLE.one tokens will be used to pay for commission fees when selling on the marketplace. They will also be used to pay for advertisements and all fees, like shop or preferential support fees, on the marketplace.

²¹ <https://qtum.org/en/>

²² <https://lightning.network>

²³ <https://raiden.network/>

²⁴ https://www.reddit.com/r/Qtum/comments/7m6atk/how_does_qtum_mainnet_resolve_smart_contracts/



CIRCLE.one token



Potential investors can buy CIRCLE.one tokens during our ICO in March 2018. We will offer a tiered pre-sale, where early adopters can secure significant benefits.

CIRCLE.one tokens or Cs are designed as a marketplace coin. The definition of a marketplace coin is: *a token integrated into mass transactions between counterparties. The functionality of this token comes down to the means of payment* inside of the marketplace with certain preferences over any other means of payment. The number of functions of the marketplace are only available with this token as means of payment.*

*refers to use as a means of payment for the services of a marketplace for transactions between counterparties in the transactions (but purely on a voluntary basis)

A minute of economic theory

From the point of view of economic theory CIRCLE.one token is essentially a form of private money (as long as the exchange is centralized and its functionality and performance exist depending on the wishes of the creators). Private money are the liability of the issuer. In this case, the liabilities are reduced due to the fact that there will be a number of functions where this private money (i.e. Cs) can be used to receive a benefit that is bigger than could be received with any other crypto currency or token. The value of this token is defined by the participation in a certain number of transactions with certain benefits for those who use it, compared to other payment methods.

Token functions:

Commission payments



4% commissions instead of 7,5% commissions when paid with Cs. These payments are made autonomously by smart contracts, creating a strong incentive for vendors to hold Cs.

Such choice binds the token demand either to the turnover of transactions in the system, or to the expectation for high turnover



Ad payments

Pay per click ads on the marketplace and search advertisement will allow vendors to promote their services and research. All advertisement will be payable in Cs.

Regardless of the form in which this promotion will be carried out, the value of the token will also be tied to the size of the user network of the marketplace (the bigger the network, the more economic sense there is in purchase of services promotion -> the greater the demand for the token becomes)



Service fee payments

Shop fees, preferential support or SLAs will be payable in Cs. These fees might dwarf in reference to the former two use types but add another dimension of functionality to the token.

We decided to use Qtum for payments to save vendors from having to deal with the kind of volatility that coins display during the first phase of their adoption. Below you can find crypto economist Vasily Sumanov's analysis of our token, who concludes: *This token has all the necessary 6 signs of "high-quality token" according to my classification that I have implemented on the basis of my own experience.*

Vasily Sumanov's requirements for successful tokens

Requirement

Isolation of the circulation system

Natural circulation in the system

Implementation in CIRCLE.one

Performed. The circuit of the token circulation will be demonstrated below

A token circulates passing from investors to participants in the marketplace, which in their turn pay various fees in tokens. A management company sells the collected fees in tokens on the open market to support its activities. The owners of streams and data processors buy these tokens to save on commission fees. The circle closes.

Investment attractiveness in the long term (Shh – don't tell the lawyers)

The independence of internal business processes to the token price

Using of the token gives additional value to network members

In the longer run and with successful implementation, the volume of connected vendors will grow along with revenue. As the demand for the token depends on the volume of transactions in the first place, the demand for the token will grow in step. Taking into account the limited emmission, the value of the token will be growing.

Since a token's value is measured by its current exchange rate, the value of the token doesn't depend on anything. If a sale is worth 1000\$, commission is 75\$ and 40\$ when paid with Cs. Assuming for the sake of this experiment that 1C is worth 1\$ you will have to pay 40 Cs. If exchange rates change, the commissions paid are still measured in Qtum.

If Cs gain in value, the commission fees paid still stay the same, but take fewer Cs to pay.

Most importantly, the main source of income of economic agents doesn't depend on the token price.

The value of Cs is connected to the network volume, quantity and quality of sold data and actual transactions. This dependence is understandable. Hence, each member of the network, accumulating these tokens or by making payments in tokens gets their "piece of the cake".

Projected demand for the token

The demand for the token on the marketplace is determined by several factors:

- The volume of purchases data on the marketplace and
- The proportion of sellers who are interested in saving on commission fees by using Cs
- Expectations about future sales and company growth.
- Volume of the advertising market – how much advertising and what quality you can buy for these tokens.
- The volume of additional services to the marketplace that you can buy for tokens

The token price in the longer run is determined by the following factors:

- The demand for the token

Demand for the token will grow in step with growth of the platform. There will only ever be a maximum of 500.000.000 Cs.

With the research market valued at \$136 billion in 2017, the big data and analytics market forecasted to reach \$187 billion in 2019 CIRCLE.one would have \$3,2 billion if it is able to capture just 1% of those markets by 2020.

That's \$128 million (4% of \$3,2 billion) in commission fees, if paid exclusively with CIRCLE.one tokens. Advertising will add substantial revenue. Ads can be targeted very accurately when tied to specific searches, as they can be on CIRCLE.one. Our customers are also likely to be on the lookout for interesting services and are able to spend significantly. We expect advertisement revenue to be at least equal to commission fees.

CIRCLE.one tokens would then have an annual turnover equivalent to \$256 million by 2020. If standard valuations used for stocks are applied, the value of 1 C can be calculated somewhere between \$3 to \$15 depending on the multiple that is used. Certainly a big way up from \$0.057 during the ICO. (calculated with the Qtum price of 2/2/18).



40% of the funds raised in the ICO will go to marketing and user training and education.

Why so much?

We believe that any network is only as valuable as the sum of its contributors. That means we need:

- High quality data sources.
- Clever data processing
- Fascinating research

Initially we will focus on customer data and consumer analytics as well as pharmaceutical production data. Customer data can come from websites, banner ads, social media or gratuity programs. Most of those are already connected to the internet and tech savvy, which means low barriers to entry and an easy learning curve.

We need to get in touch and support researchers, analysts, data brokers and scientists to use CIRCLE.one. This takes the diligent effort of many people in addition to world class marketing. World class marketing is expensive. We'd rather pay a lot for great marketing and get the product flying first, than skimp on that front and risk very slow adoption and the possibility that a more decisive competitor could outmaneuver our efforts.

In addition to online advertising about the ecosystem and our products, CIRCLE.one will use most of its marketing funds:

- To convince high quality data sources from selling on the platform.
- Finding an incentivizing the best research companies and big data processors to sell on the platform.
- Funding research to offer unique and truly astounding insights, exclusive to CIRCLE.one.

We will use advertisements, discounts, trainings and courses to help users get the most out of the platform. CIRCLE.one wants to be the one stop shop for high quality research and data. Proactive market making, user training and education combined with traditional advertising and marketing, will ensure this happens sooner than later.

Timeline



Our development team has already started with the groundwork of development for the CIRCLE.one protocol. We expect 6 months development time after the ICO until a beta version can go public and early adopters can be onboarded. Another 6-12 months after that until the workflows and user experience are truly established and the marketplace and wallet app can be let loose. We will use the time necessary to develop an outstanding product to get in touch with data brokers, sensor owners, research companies, analysts and big data service providers. Ideally CIRCLE.one can be populated with interesting offers from the start and everybody can start profiting from an open, easy to use marketplace.

Target Audience

Competition

Repux.io and IOTA's datum marketplace is the most serious competition to CIRCLE.one. IOTA has made a great name for itself and has secured many collaboration agreements with Fortune 100 companies like Accenture and Microsoft. Repux.io is a very well designed ICO that combines a data marketplace with an emphasis on automated data processing through deep learning and neural networks.

The table below gives a short comparison and helps point out where the strength of each competitors are.

| | IOTA datum | CIRCLE.one | Repux.io |
|------------------|-----------------|-------------------------|----------------------------------|
| Focus | Raw sensor data | Insights | Machine learning |
| Development | Alpha | MVP | Alpha |
| Industry support | Very good | Not yet | None |
| Purpose | Promote IOTA | The Amazon for insights | Connect data to machine learning |

CIRCLE.one focuses on processed data and insights from the outset, while IOTA's datum seems to be destined as an add-on for the IOTA payments and IoT platform.

Repux.io focuses on connecting data sources to machine learning platforms and algorithms and also selling their findings. In that regard Repux.io is a more direct competitor than datum.

CIRCLE.one focuses on research that is done by scientists and researchers. Some will use machine learning and AI as tools to extract value from data. But ultimately this happens under human oversight and direction. We believe this approach yields more interesting results that can also scale to greater complexity.

The whole market is destined to be worth tens of billions, so there's certainly space for multiple players.

With a monomaniacal focus on user experience and a push to capture the most profitable segments of the DIKW pyramid, CIRCLE.one is positioned to perform well in this field.

We will focus on quality first, which could lead to slower initial growth. But satisfied customers are loyal customers. This means CIRCLE.one will steadily increase in value over the years.

Sample use cases

Data source owner:

Every owner of a data source that is not confidential wants to commercialize his data at the highest price possible. Doing so will allow improvements to the quality of data delivered or the development of additional data sources.

Until now, this would have involved building a proprietary web shop with credit card payment systems. CIRCLE.one helps a data source owner to find customers, and achieve realistic prices. Since the number of subscribers is basically unlimited, interesting data can make meaningful profits.

Researcher:

Selling research has been extremely difficult so far. If the research was not mandated by a research company, the researcher had to go through established journals. Often that meant co-authoring his study with established names, that would then take most of the credit.

Researchers can publish on CIRCLE.one, and our search function will help drive customers to the right kind of information. CIRCLE.one levels the playing field and eliminates traditional gatekeepers.

Marketing professional:

A marketing professional is looking for studies the size of a future product's market. He needs aggregated data and some research and insights. CIRCLE.one search points to similar products, and their website and sales metrics, as well as a study that illustrates the products potential. Quick and easy purchases and swift delivery allow her to deliver better results, more accurate predictions and recommendations.

Production plant owner:

Gauging market demand is one of the most important jobs when adjusting production. Consumer data and studies can help with planning and can meet economic goals.

The more specific and accurate the data, the more the impact.

Thanks to CIRCLE.ones accurate search it will help find exactly the data sources a production plant owner could need, when he needs it. Smart contracts and automatic fulfillment guarantee swift access to subscriptions.

Production plant owner:

Gauging market demand is one of the most important jobs when adjusting production. Consumer data and studies can help with planning and can meet economic goals.

The more specific and accurate the data, the more the impact.

Thanks to CIRCLE.ones accurate search it will help find exactly the data sources a production plant owner could need, when he needs it. Smart contracts and automatic fulfillment guarantee swift access to subscriptions.

CIRCLE.one, the data you want, when you need it.



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Legal and Disclaimer

If this whitepaper convinced you that the CIRCLE.one ecosystem has merit and you want to invest in the ICO held in December 2017, please be sure to read the following section detailing legal issues, risks involved and some information about if you can participate from the country you are living in.

Risk factors

The purchase of ERC20 tokens involves a high degree of risk. These risks are described below, but are not limited to these, and therefore this risk factor statement does not claim integrity.

Before acquiring CIRCLE.one Token, it is recommended that each potential token holder carefully considers all the risks that are stated in this whitepaper, especially the following risk factors.

Certain risks relating to the purchase, sale and use of CIRCLE.one tokens

Important Note: CIRCLE.one tokens are not being structured or sold as securities or any other form of investment product. Accordingly, none of the information presented in this whitepaper is intended to form the basis for any investment decision, and no specific recommendations are intended.

The CIRCLE.one project expressly disclaims any and all responsibility for any direct or consequential loss or damage of any kind whatsoever arising directly or indirectly from:

(i) reliance on any information contained in this whitepaper, (ii) any error, omission or inaccuracy in any such information, or (iii) any action resulting from such information.

Security weaknesses

Because the CIRCLE.one is based on open-source software, there is a risk that a third party or a member of the CIRCLE.one team may intentionally or unintentionally introduce weaknesses into the core infrastructure of the platform, which could negatively affect CIRCLE.one tokens, including CIRCLE.one tokens' utility for obtaining services.

Risk of mining attacks

As with other decentralized cryptographic tokens based on the Ethereum protocol, CIRCLE.one tokens are susceptible to attacks by miners in the course of validating CIRCLE.one tokens transactions on the Ethereum blockchain, including, but not limited to: double-spend attacks, majority mining power attacks, and selfish-mining attacks. Any successful attacks present a risk to the platform and CIRCLE.one tokens, including, but not limited to, accurate execution and recording of transactions involving CIRCLE.one tokens.

Risks associated with the Ethereum protocol

Because CIRCLE.one tokens and the platform are based on the Ethereum protocol, any malfunction, breakdown or abandonment of the Ethereum protocol may have a material adverse effect on the platform or CIRCLE.one tokens. Moreover, advances in cryptography, or technical

advances such as the development of quantum computing, could present risks to CIRCLE.one tokens and the platform, including the utility of CIRCLE.one tokens for obtaining Services, by rendering ineffective the cryptographic consensus mechanism that underpins the Ethereum protocol.

Risk of losing access to CIRCLE.one tokens due to loss of private key(s), custodial error or purchase error

A private key, or a combination of private keys, is necessary to control and dispose of CIRCLE.one tokens stored in your digital wallet or vault. Accordingly, loss of requisite private key(s) associated with your digital wallet or vault storing CIRCLE.one tokens will result in loss of such CIRCLE.one tokens.. Moreover, any third party that gains access to such private key(s), including by gaining access to login credentials of a digital wallet or vault service you use, may be able to misappropriate your CIRCLE.one tokens. Any errors or malfunctions caused by or otherwise related to the digital wallet or vault you choose to receive and store CIRCLE.one tokens, including

your own failure to properly maintain or use such digital wallet or vault, may also result in the loss of CIRCLE.one tokens. Additionally, your failure to follow precisely the procedures set forth in the whitepaper for buying and receiving CIRCLE.one tokens, including, for instance, if you provide the wrong address for receiving CIRCLE.one tokens, may result in the loss of your CIRCLE.one tokens.

Risks associated with markets for CIRCLE.one tokens

CIRCLE.one tokens are intended to be used solely on the platform. There is no support for any secondary trading or external valuation of CIRCLE.one tokens. This restricts the contemplated avenues for using CIRCLE.one tokens to obtain Services or access the platform, and could therefore create illiquidity risk with respect to CIRCLE.one tokens you hold. Even if secondary trading of CIRCLE.one tokens is facilitated by third party exchanges, such exchanges may be relatively new and subject to little or no regulatory oversight, making them more susceptible to market-related risks. Furthermore, to the extent that third-parties do ascribe an external exchange value to CIRCLE.one tokens (e.g., as denominated in a digital or fiat currency), such value may be extremely volatile and diminish to zero.

Risk of uninsured losses

Unlike bank accounts or accounts at some other financial institutions, CIRCLE.one tokens are uninsured unless you specifically obtain private insurance to insure them. Thus, in the event of loss or loss of utility value, there is no public insurer, such as the Federal Deposit Insurance Corporation, or private insurance arranged by us, to offer recourse to you.

Risks associated with uncertain regulations and enforcement actions

The regulatory status of CIRCLE.one tokens and distributed ledger technology is unclear or unsettled in many jurisdictions. It is difficult to predict how or whether regulatory agencies may apply existing regulations with respect to such technology and its applications. It is likewise difficult to predict how or whether legislatures or regulatory agencies may implement changes to law and regulation affecting distributed ledger technology and its applications, including the platform and CIRCLE.one tokens. Regulatory actions could negatively impact the platform and CIRCLE.one tokens in various ways, including, for purposes of illustration only, through a determination that CIRCLE.one tokens are a regulated financial instrument that requires registration or licensing. The company may cease operations in a jurisdiction in the event that regulatory actions, or changes to law or regulation, make it illegal to operate in such jurisdiction, or commercially undesirable to obtain the necessary regulatory approval(s) to operate in such jurisdiction.

Risks arising from taxation

The tax characterization of CIRCLE.one tokens is uncertain. You must seek your own tax advice in connection with purchasing CIRCLE.one tokens, which may result in adverse tax consequences to you, including withholding taxes, income taxes and tax reporting requirements.

Risk of an unfavorable fluctuation of cryptocurrency values

The proceeds from selling CIRCLE.one tokens are intended to be used for expanding the CIRCLE.one project and to develop its core technology, as stated in this whitepaper. The proceeds of the sale of CIRCLE.one tokens will be denominated in Ether, and may, at our discretion, be converted into other cryptographic and fiat currencies. If the value of Ether or other currencies fluctuates unfavorably during or after the Sale Period, there is the possibility that the intended use of the proceeds may not be sufficient to develop the CIRCLE.one project as explained in this whitepaper.

Force Majeure

The CIRCLE.one business may be disrupted, suspended or delayed as a result of force majeure circumstances. Force majeure is intended to mean for the intention of this whitepaper, any extraordinary circumstances and occurrences which could not be impeded and shall include: wars, mass civil disturbances, armed conflicts, acts of nature, industrial operations, lockouts, epidemics, ongoing shortage or other failures of power supplies or communication service, acts of state and other circumstances beyond CIRCLE.one's control, which did not exist at the time of the Token Launch.

Disclosure of information

Personal information obtained from CIRCLE.one tokens holders, information about the amount of tokens, the wallet addresses used, and any other related information may be disclosed to government officials, law enforcement, and other third parties in case the CIRCLE.one project is required to disclose such information by law, court order, or subpoena. At no time shall the CIRCLE.one project be held responsible for such information disclosure.

Change of the value of the CIRCLE.one tokens

The value of the CIRCLE.one tokens can notably change on account of different reasons once the tokens have been bought. There is no guaranteed value of the CIRCLE.one tokens at any given time period. The CIRCLE.one project is not legally liable for any change in the value of CIRCLE.one tokens. Statements regarding future developments include, not exclusively, predictions about future economic, market, and competitive conditions and operation decisions. The majority of these are not under the control of the CIRCLE.one project team and so cannot be predicted precisely. Even though the CIRCLE.one team considers that its

predictions and forward-looking statements are legitimate, they might be erroneous. Emerging from that fact, the CIRCLE.one team will offer no guarantees that the predictive statements included in this whitepaper will turn out to be definitive. As a result of the uncertainties in the forward-looking statements contained in this whitepaper, the integration of such information should not be interpreted as a warranty on behalf of the CIRCLE.one project or another entity that the plans and purposes of the CIRCLE.one project will be effectively reached. The CIRCLE.one project may be subject to other risks not foreseen at this moment by the management team.

Unanticipated risks

Cryptographic tokens such as CIRCLE.one tokens are a new and untested technology. In addition to the risks included in this whitepaper, there are other risks associated with your purchase, holding, and use of CIRCLE.one Token, including those that are not anticipated in this whitepaper. Such risks may further materialize as unanticipated variations or combinations of the risks discussed in this whitepaper.

Terms & Conditions

The CIRCLE.one management team accepts responsibility for the information contained in this whitepaper. To the best of the knowledge and belief of the management team (who have taken all reasonable care to ensure that such is the case) the information contained in this whitepaper is in accordance with the facts and does not omit anything likely to affect the import of such information.

Certain information contained in this whitepaper constitutes "forward looking statements", which can be identified by the use of forward-looking terminology such as "may", "will", "should", "expect", "anticipate", "project", "estimate", "intend", or "believe" or the negatives thereof or other variations thereon or comparable terminology. Due to various risks and uncertainties, including those described under the sections headed "Risk Factors", actual events or results or the actual performance of CIRCLE.one may differ materially from those reflected or contemplated in such forward-looking statements.

Restriction on distribution

The distribution of this whitepaper and the ICO in certain jurisdictions may be restricted and accordingly persons into whose possession this whitepaper may come are required to inform themselves of and to observe any such restrictions.

In particular the information in this whitepaper is not intended for and applicable to U.S. citizens or legal entities domiciled in the U.S. Financial instruments or products referred to in this whitepaper must not be offered in the United States of America and must not be sold to U.S. citizens or legal entities domiciled in the U.S.

This whitepaper is a solicitation to prospective applicants who meet the eligibility criteria to participate in the ICO and does not constitute an offer for sale of shares. However, it does not constitute a solicitation to any person in any jurisdiction in which such solicitation is not authorized or to any person to whom it would be unlawful to make such solicitation. The foregoing information is for general guidance only. It is the responsibility of any person or persons in possession of this whitepaper and wishing to participate in the ICO to inform themselves of, and to observe, all applicable laws and regulations of any relevant

jurisdiction. Prospective participants should inform themselves as to legal requirements also applying and any applicable exchange control regulations and applicable taxes in the countries of their respective citizenship, residence or domicile.

Disclaimer

This whitepaper does not constitute a recommendation by CIRCLE.one, its management team, the Advisory Board or any other person, or advice to any recipient of this whitepaper, on the merits of participation in the ICO. This whitepaper does not necessarily identify, or purport to identify, all the risk factors associated with CIRCLE.one. Prospective participants must make their own independent assessment, after making such investigations as they consider necessary, of the merits of participating in the ICO. Prospective participants should consult and rely upon their own investment, accounting,

legal and tax representatives and advisers as to such matters concerning CIRCLE.one and to evaluate independently the financial risks, consequences and suitability of an investment in CIRCLE.one, or if in any doubt about the contents of this whitepaper.

Investment in CIRCLE.one carries substantial risk and may involve special risks that could lead to a loss of all or a substantial portion of such investment (see further under the section headed "Risk Factors").

Unless prospective participants fully understand and accept the nature of CIRCLE.one and the potential risks inherent in CIRCLE.one they should not invest in CIRCLE.one. Each prospective participant is wholly responsible for ensuring that all aspects of CIRCLE.one are acceptable to them.

There can be no assurance that CIRCLE.one's investment objective will be achieved and investment results may vary substantially over time. Investment in CIRCLE.one is not intended to be a complete investment program for any investor. Prospective participants should carefully consider whether an investment is suitable for them in light of their circumstances and financial resources. Prospective participants should inform themselves as to the legal requirements within the countries of their nationality, residence, ordinary residence or domicile for such acquisition, any foreign exchange restrictions or exchange control requirements which they might encounter on acquisition or disposal of CIRCLE.one tokens and the income tax and other taxation consequences which might be relevant to the acquisition, holding or disposal of CIRCLE.one tokens.

IF THE PROSPECTIVE PARTICIPANT IS IN ANY DOUBT ABOUT THE CONTENTS OF THIS DOCUMENT THEY SHOULD CONSULT WITH THEIR ACCOUNTANT, LEGAL ADVISER OR OTHER PROFESSIONAL ADVISER BEFORE INVESTING.

Short term investments

To the extent CIRCLE.one's assets are not invested in the development or market making, and during periods in which the CIRCLE.one's management team believes that economic, financial or political conditions make it advisable, or opportunities for capital appreciation are limited or for defensive purposes, CIRCLE.one may invest in short term debt securities or may hold cash in fiat or crypto currencies. In addition, CIRCLE.one may place all or part of its assets in temporary investments for cash management purposes pending investments of initial or subsequent subscription monies in accordance with the investment objectives, or in order to meet redemption requests and/or its opera-

tional expenses. Holding of investment It may be necessary or prudent in relation to some of the investments for CIRCLE.one to register the purchase of such Investments in the name of a custodian or a nominee. The CIRCLE.one management team will put in place suitable arrangements to help protect any such investment.

Token purchases

The CIRCLE.one management team may at any time and for any reason decide to purchase or sell CIRCLE.one tokens.

Anti Money Laundering

Measures aimed at the prevention of money laundering may require a participant in the ICO to verify his identity and/or the source of funds to CIRCLE.one.

By way of example, an individual may be required to produce the original passport or identification card or copy duly certified by a public authority such as a notary public, the police or the ambassador in his country of residence, together with two original documents evidencing his address such as a utility bill or bank statement or duly certified copies. In the case of corporate applicants this may require productio of a certified copy of the Certificate of Incorporation (and any change of name) and of the Memorandum and Articles of Association (or equivalent), and of the names and residential and business addresses of all

directors and beneficial owners. The details given above are by way of example only and the Company will request such information and documentation as it considers is necessary to verify the identity or source of funds of an applicant.

Each ICO participant acknowledges that CIRCLE.one shall be held harmless against any loss arising as a result of a failure to provide such information and documentation as has been requested by CIRCLE.one.

Token Usage Rights

The CIRCLE.one tokens carry no ownership, revenue or governance rights: The ICO participant understands and accepts that CIRCLE.one tokens do not represent or constitute any ownership right or stake, share or security or equivalent rights nor any right to receive future revenues, shares or any other form of participation or governance right in or relating to CIRCLE.one other than the right to earn the profits from the operation as described in this whitepaper.

Representation and warranties by the participant

By transferring ETH to the Smart Contract System, the ICO participant represents and warrants that:

- the ICO participant is not a citizen or resident of a country, whose legislation conflicts with the present allocation of CIRCLE.one tokens and/or CIRCLE.one in general;
- the ICO participant is not a citizen or resident of the USA;
- the ICO participant has a deep understanding of the functionality, usage, storage, transmission mechanisms and intricacies associated with cryptographic tokens, like Bitcoin (BTC) and Ether (ETH), and blockchain-based software systems;
- the ICO participant understands and accepts that there is no warranty or assurance that the network of miners will allocate the CIRCLE.one tokens to the ICO participant.
- the ICO participant has carefully reviewed the code of the Smart Contract System located on the Ethereum blockchain at the addresses specified on the CIRCLE.one website and fully understands and accepts the functions implemented therein;
- the ICO participant is legally permitted to transfer ETH to the Smart Contract System, create, liquidate and obtain CIRCLE.one tokens in the ICO participant's jurisdiction;
- the ICO participant will contribute ETH from a wallet or wallet service provider that technically supports the CIRCLE.one tokens. ICO participant understands and accepts, that failure to assure this may have the result that ICO participant will not gain access to his CIRCLE.one tokens; the ICO participant is legally permitted to receive software and contribute to the Smart Contract System;
- the ICO participant is of a sufficient age to legally create and obtain CIRCLE.one tokens;
- the ICO participant will take sole responsibility for any restrictions and risks associated with the creation of CIRCLE.one tokens by the Smart Contract System as set forth below;
- the ICO participant is not submitting ETH to the Smart Contract System to obtain CIRCLE.one tokens for the purpose of speculative investment;
- the ICO participant is not obtaining or using CIRCLE.one tokens for any illegal purposes;
- the ICO participant waives the right to participate in a class action lawsuit or a class wide arbitration against CIRCLE.one or any individual involved with the creation of CIRCLE.one tokens or CIRCLE.one;

- the ICO participant understands the creation of CIRCLE.one tokens does not involve the purchase of shares or any equivalent in any existing or future public or private company, corporation or other entity in any jurisdiction;
- the ICO participant understands that the transfer of ETH to the Smart Contract System and the creation of CIRCLE.one tokens carries significant financial, regulatory and reputational risks as further set forth in this Prospectus;
- the ICO participant understands and expressly accepts that there is no warranty whatsoever on CIRCLE.one tokens and the Smart Contract System, expressed or implied, to the extent permitted by law, and that the Smart Contract System is used and CIRCLE.one tokens are created and obtained at the sole risk of the User on an “as is” and “under development” basis and without, to the extent permitted by law, any warranties of any kind, including, but not limited to, warranties of title or implied warranties, merchantability or fitness for a particular purpose;
- the ICO participant understands that the User has no right against any other party to request any refund of the ETH submitted to the Smart Contract System for the creation of the CIRCLE.one tokens under any circumstance;
- the ICO participant understands that the value of CIRCLE.one tokens over time may experience extreme volatility or depreciate in full; the ICO participant understands that the ICO participant bears the sole responsibility to determine if the User’s contribution to the Smart Contract System, the transfer of ETH to the Smart Contract System, the creation, ownership, use or liquidation of CIRCLE.one tokens, the potential appreciation or depreciation in the value of CIRCLE.one tokens over time (if any), and the allocation of CIRCLE.one tokens have tax implications for him; by creating, holding, using or liquidating BNT, and to the extent permitted by law, the User agrees not to hold any third party (including developers, auditors, contractors or founders) liable for any tax liability associated with or arising from the creation, ownership or CIRCLE.one tokens.



CIRCLE.ONE

SENSOR DATA MARKETPLACE



www.circle.one

se@circle.one