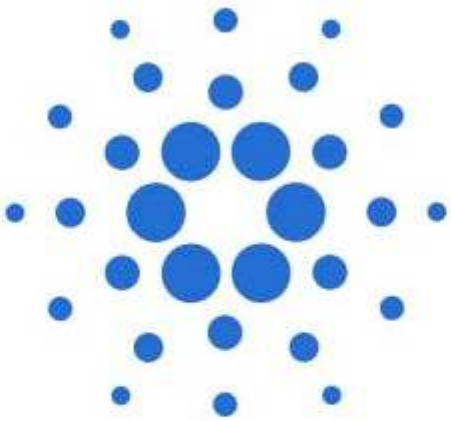

CARDANO

Market Research

Summary

This exciting network is more of a collection of philosophical principles and computer scientists than a start-up with a product.

Cardano is developing a smart contract platform and leading the charge in what some are calling “Blockchain 3.0”. With a more scalable and flexible network than some of the older projects like **Bitcoin** and **Ethereum**. Even though **Cardano** is still in its early stages, the complexity of the technology and the pace at which it is progressing is extremely impressive.

All information is valid as of July 17th, 2018. All feedback is welcome.

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Basic Statistics

- **Crypto-asset type:** Utility Token
- **Max. Supply**: 45,000,000,000 ADA
- **Current Circulating Supply**: 25,927,070,538 ADA
- **Market Capitalization**: $3.88 bn
- **Token Economics:** Currently a deflationary asset with a fixed supply. Inflation rate (if any) to be decided by token holders in the future as staking rewards.
- **Protocol:** Ouroboros Proof-of-Stake

History & Development

Cardano is a project established by Charles Hoskinson, one of the co-founders of **Ethereum** and an important player in the cryptocurrency sphere. In 2015 he created a company along with Jeremy Wood, named IOHK (Input Output Hong Kong) that is responsible for building and developing the **Cardano** network.

The three main stakeholders behind the project are IOHK, The Cardano Foundation and Emurgo, a company that supports commercial ventures on the Cardano platform.

The first version of the network, named **Byron** after the famous poet, was successfully launched on September 29th, 2017 and it was quickly introduced in several important cryptocurrency exchanges just in time to catch the dramatic price rise of the crypto industry of late 2017.

The project is still in a very early stage of development. During Q2 and Q3 in 2018, new features will be released with a new version named **Shelley**, that will introduce key elements for a decentralized and secure network.

The three subsequent phases are named **Goguen** (after the American software engineer), **Basho** (the Japanese poet of the Edo period) and **Voltaire** (the famous French philosopher). Goguen will implement a virtual machine and language specifically designed for **Cardano**, while Basho and Voltaire will focus on improving the scalability of the network and introducing a Treasury and voting system.

Even though **Cardano** is still in the early stages of it's roadmap it is definitely one of the most promising blockchain projects we've ever seen. It is also the first blockchain project that is being developed using a collective scientific philosophy, based on peer-reviewed scientific research. A great number of its most important features are still under development.

Development Team

The **Cardano** project was created by Charles Hoskinson.

Charles Hoskinson is an American technology entrepreneur. After studying Mathematics at the University of Colorado at Boulder, he started a career

within cryptocurrency. After co-founding **Ethereum**, the second most popular cryptocurrency after **Bitcoin**, he went on to found IOHK, where he is currently acting as the company's CEO, leading the development of the **Cardano** project.

Michael Parsons is the Chairman and Executive Director of the Cardano Foundation, whose goal is to promote the **Cardano** protocol and its ecosystem. He has more than 25 years of experience in the banking industry and was an early advocate for **Bitcoin**, becoming one of the most relevant crypto advisors in the United Kingdom.

Use Cases

Cardano implements a complete blockchain-based environment where smart contracts, decentralized applications, and secure quick transactions are readily available. Virtually all applications that require transferring money, storing or accessing records, or performing any kind of interaction between users, could make use of an environment like **Cardano**.

Some of the industries that could be disrupted by this technology are:

- **Financial Services:** banking services like lending, investing and transferring money can all be implemented in the blockchain using smart contracts, making the process fast and automatic, and eliminating the need for a middleman.
- **Official Records:** the **Cardano** network can be used to securely store records in a transparent and convenient way. **Cardano** is already being used to offer cryptographic proof of diplomas obtained in several universities. Other similar applications could be enabling blockchain-based elections or maintaining a country's property ledger.
- **Supply Chain:** tracking of goods during the supply chain is a popular application of blockchain technology that can help thousands of companies save vast amounts of money in theft and fraud, as well as offer much more transparency to the customer. The tracking of diamonds on their journey from the mines to the jeweler to the end consumer can add some much-needed clarity to this market.
- **Accounting:** companies and organizations can use a blockchain to manage their budgets and accounts, or use smart contracts for reconciliation of expenses.
- **Decentralized Applications:** given that **Cardano** should in principle be considerably faster than networks like **Ethereum**, decentralized applications that require fast and

secure services (e.g. social networks, sharing economy applications similar to Uber or Airbnb) could find application in the network.

These are just some of the use cases that a fully operational, fast and decentralized blockchain network could have. Eventually, a mature blockchain could act as the back-end that handles the majority of the services run by corporations and governments.

Technical Description

Ethereum and some other blockchain projects like **NEO** conformed what was named the "Blockchain 2.0". These projects introduced significant differences with respect to the first cryptocurrencies like **Bitcoin**, with the most important one perhaps being the ability to deploy smart contracts, decentralized applications and new tokens on top of the network.

A **smart contract** is analogous to a traditional contract between two parties, with the difference that the enforcement of the contract is guaranteed by the underlying blockchain and therefore there is no need for a central authority or legal system to enforce it.

Smart contracts were first proposed in 1994 by Nick Szabo and found their first large-scale implementation on the **Ethereum** network.

A **decentralized application (dApp)** is analogous to a software application on traditional computers and websites. Unlike these traditional solutions, dApps run on a decentralized network formed by thousands of computers.

Cardano, along with some other new projects represent the third generation of blockchain and aim to develop a new iteration of the technology to create more scalable and sustainable networks, while maintaining the privacy, security and governance of the most successful and more established projects.

One thing that seperates **Cardano** from cryptocurrencies like **Bitcoin** or **Ethereum** is in its state of the art consensus algorithm. The former two use a Proof-of-Work algorithm, which has proven to be particularly costly in terms of energy consumption required for mining. **Cardano** implements Ouroboros, a Proof-of-Stake algorithm that does not require any mining. Instead, blocks are generated by stakeholders, which are those users that hold a certain amount of tokens. **Cardano** claims to be the first blockchain implementing a provably fair Proof-of-Stake consensus algorithm.

In the **Proof-of-Work** protocol, computers in the network compete to solve mathematical problems in order to obtain rewards in the form of coins, while securing the network. A downside of this is the high costs in terms of energy associated with this protocol.

Meanwhile, in the **Proof-of-Stake** protocol, token holders are the ones in charge of validating transactions and securing the network, by *staking* (locking up) their coins temporarily in exchange of a reward similar to a dividend. Many people believe this new protocol will become the new standard for cryptocurrencies. **Ethereum** is actually scheduled to transition from Proof-of-Work to Proof-of-Stake in the future.

Cardano is completely written in Haskell, a very flexible programming language, and in fact Philip Wadler, one of the designers of the language, is employed by IOHK to help develop the network. However Cardano is creating a new blockchain-based language based on Haskell named Plutus.

Future Developments

The construction of different types of digital wallets (paper wallets, hardware and software wallets, as well as multi-signature accounts) has been the main goal of the first stages of the project, before deploying a truly decentralized network.

The most important elements to achieve decentralization, like voting, delegation or the reward system, will be deployed as features of the Shelley version of the protocol and are now the main point of focus for the development team. As of now, the network is run by nodes controlled by the Cardano Foundation, IOHK, and Emurgo.

Stake Pools are an important concept that is also under development. These are basically organizations that stake their tokens and get rewarded for doing so, while other users of the network delegate their tokens to these pools. The team is analyzing in detail the reward system and how it will affect the number and competition of stake pools, to avoid a situation like that of **Bitcoin** where a handful of mining pools control all the mining process. Stake Pools will also allow participants with a smaller principal investment to join in the process of earning coins in order to maintain the stability of the network.

The team is following a strategy of releasing new developments one by one, avoiding major version releases or introducing too many new changes at once.

The Cardano Foundation is also securing strong partnerships to advance the development of **Cardano** and blockchain technology in general. One of the most important partnerships is one with Z/Yen, a London-based commercial think-tank under the blockchain research **Distributed Futures** programme.

This programme will focus on producing research projects and papers proposing proofs of concept based on blockchain that could serve as new use cases for **Cardano** and other cryptocurrencies. Z/Yen is already working on studying the effect of blockchain on world trade, insurance and policy making, among other applications.

Upcoming Projects

Given that the project is still in a very early stage of development and the network is not fully operational, there are still not many significant projects built on top of **Cardano**. The first Initial Coin Offering (ICO) to take place on the network is **Traxia**, which launched in March 2018. Although it is now running on **Ethereum**, it will be ported to **Cardano** once the Goguen update is released later in the year.

The project is creating a decentralized finance system focused on invoice payments. Buyers and sellers will exchange money through automated smart contracts, using their usual fiat currency with the cryptocurrency solution simply running on the back-end. This project has great potential given the huge amount of invoices that are paid late, or sometimes left unpaid. A solution like this could help millions of businesses around the world to better manage their working capital.

Cardano's funding program, Emurgo, has also invested in the project, thus showing the support for this first ICO deployed on the network.

Traxia is not the only project moving from **Ethereum** to **Cardano**. For instance, several pharmaceutical companies that are currently using **Ethereum** are considering the transition. The pharmaceutical industry is a very interesting application for blockchain both for maintaining secure and immutable records and for monitoring the supply chain of these very valuable goods.

On a separate note, the **Cardano** team has also signed a deal with the Ethiopian government to develop blockchain-based solutions for the agricultural industry of the country and introduce the network to possible developers.

Token Valuation Analysis

It is particularly difficult to perform an accurate valuation analysis of **Cardano** in its present state, because the network is still in a very early stage and some of the parameters defining its performance are still unknown or may change significantly in the near future.

For instance, transaction fees now follow a mixed system consisting of a fixed term and a variable term that depends on the transaction size. For an average

transaction, the fees add up to about 0.16 ADA or $0.025 at current prices. However, these values could be raised or lowered in the future depending on the performance of the network and what the user base decides.

Also, since the network does not have all features fully operational yet, it is hard to predict the actual use that the network will have (transaction volume) at a later stage. A great number of successful and established dApps and services launching on the platform would indeed increase the utility of the network and therefore the price of the token.

Since the staking system rewards users that hold a certain amount of tokens, it can be argued that a significant percentage of the supply will effectively be "locked in" by these users and Stake Pools, thus limiting the amount of tokens in circulation and potentially increasing their value. In this scenario, the **ADA** token would experience a greater use as a store of value, similar to **Bitcoin**.

For now, investors in **ADA** are backing a highly-respected and experienced team with some very big ideas.

For these reasons, **Cardano** has the potential to become a very successful project as it progresses through its long and ambitious roadmap.

Investments Risks

Trading cryptocurrencies can potentially be very profitable as seen in the past, but it is also a very challenging activity that can carry a significant level of risk. Cryptocurrency markets are associated with high volatility, and **Cardano** is no exception.

The project is still in a relatively early stage, and the roadmap is very long, so although the potential of the project is vast, as outlined in the previous sections, it is important to consider that the short-term fluctuations will depend mostly on speculation.

It is important to carefully assess your investment goals, methodology and level of experience before deciding to start investing in a new market. It is also extremely important to diversify and view cryptocurrency as an additional element of your portfolio. Given the high risk associated with this type of asset, it is recommended not to allocate more than 20% of your portfolio into cryptocurrencies. Given that the possibility to lose a part or even all the money invested exists, it is extremely important to invest only money that you can afford to lose.

In any case, all the information presented in this Market Report does not constitute financial advice, and introduces no obligation or recommendations for action.

Resources

- Cardano Roadmap
- Video: Cardano Shelley Update
- Video Review: What is Cardano?

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