



White Paper for CryptoRiyal – Building the new future with Smart Cities



CryptoRiyal

Token powering Smart Cities

Revolutionizing with AI/ML technology for tomorrows world

Version 1.3

Web: www.cryptoriyal.com

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Executive Summary

The CryptoRiyal project is an ambitious work that involves a variety of sub projects with the aim to revolutionize the use of Artificial Intelligence and technology in designing the modern Smart Cities. The SmartRiyal platform and the CryptoRiyal token (sign: CR) are innovative means of trade, payment and the underpinnings of technological advances especially developed to fulfill the needs of the businesses and residents of any Smart City.

CryptoRiyal tokens can be transferred from one electronic wallet to another, kept and saved or converted into fiat money or to other crypto-currencies on the SmartRiyal platform. SmartRiyal is built to enable fiat-to-crypto, crypto-to-crypto and data-to-crypto transfers based off the Ethereum Blockchain. SmartRiyal is accessible by anyone, everywhere and presents the ultimate solution for avoiding time-consuming face-to-face meetings for money transfers, expensive money transfers via banks and money transfer agencies or trust issues, due to the smart contract implemented in the system and the fully protected encryption method of the Blockchain. CryptoRiyal Investment platform brings the power of crowdfunding to enable token holders to list investment opportunities on the platform and seek investors.

Further, SmartRiyal leverages advanced Artificial Intelligence and Machine Learning algorithms to collect, process and learn from data which users transmit and to generate real time recommendations to them in every sector relating to business and technological activities.

The CryptoRiyal token supports all the financial requirements that are derived from the futuristic vision and characteristics of Smart Cities and provides the state-of-the-art technological solution for all target sectors, as well as to any other financial, economic or business need.

Introduction – Building the future city token by token

Overview

Internet of Things (IoT) is making its mark across industries not only because we are shifting into a digital age but also because cities are finding innovative ways to bring information technology to solve problems quicker and more efficiently. The fundamentals that drive IoT is technology and data - both work hand in hand to produce automatic sense and respond capabilities. This is seen in Smart Cities where sensors are used to detect traffic conditions and environmental conditions as well as RFID tags that track tags attached to objects.

IoT is expected to quadruple in size by 2020 (Brown, 2015). To analyze data and bring about solutions that can add value to everyday life is not only necessary but also improves the quality of life. Many governments are adapting IoT enabled solutions which include cloud computing and intelligent networking across urban systems including water, energy, waste, transportation because the technology being used offers viable solutions to solvable problems. Moreover, IoT offers the opportunity to build cities that are capable of becoming economically viable, and sustainable.

The support for IoT is already being seen in government sectors throughout the United Kingdom and Europe. In the United Kingdom, Prime Minister David Cameron has dedicated \$122 Million to fund research for the development of IoT while in the USA, the White House continuously supports IoT development through programs such as Smart America Challenge (Alder, 2015). As governments begin to understand the pressing need of IoT and the benefits it can bring to various sectors, adaptations in areas such as environment and transportation is becoming more and more common.

CryptoRiyal envisions to enable these cities of tomorrow to become smart and connected by providing comprehensive end-to-end technological support for these Smart Cities. By transforming data into useful information, IoT will not only progress in development but will become an integral part of Smart Cities. IoT will offer secure network connectivity and reliability which will play an impactful role in solving many

problems surrounding issues of water, waste, public transport, energy, etc. Understanding that IoT is already embedded in many areas of daily life will allow people and institutions to take advantage of the benefits technology can have on a digital world.

Blockchain Based Financial Transaction System

In the new world of Smart Cities, CryptoRiyal will be the core of the financial transaction system. CryptoRiyal looks to build a platform to power the Smart Cities that can be used not only by the inhabitants through their digital wallets but also by machines in their pursuit to execute machine to machine transactions, thus a means to execute and monetize the insights created from the huge data that would be constantly generated. CryptoRiyal will enable to create an ecosystem to easily transform valuable data in a medium of currency.

This will set up the platform for the modern-day data centers and power management which would be completely driven by 'tokenized data' from different entities. CryptoRiyal will be the main engine to tokenize this data based on the value it brings to the entire operation of the city. The quality and validity of the data generated will be done by the blockchain driven token economics of CryptoRiyal.

Incentivizing Data Insights in the Smart Cities

The CryptoRiyal token leveraging its Artificial Intelligence platform - SmartRiyal - aims at forming a new, fully secure and rapid monetary standard – serving every transaction from services and goods provided within it, imported and exported, to long term investments in its businesses and technological ventures. Further, the CryptoRiyal will enable both individuals and organizations to monetize their data, to profit from-sharing or staking it and to be able to receive insights from the cumulative data that the system collects and analyzes by applying advanced Artificial Intelligence techniques. The reward will be in the form of CryptoRiyal tokens paid to data contributors for the data streams that they share.

The data collected from the IoT devices is processed in SmartRiyal which uses AI and Machine Learning algorithms to transform data into recommendations and insights for users. Users purchase subscription to the recommendation system by paying with CryptoRiyal tokens (these can be data or external users) and gain access to insights. This advanced platform can assist in continuously analyzing and improving every aspect of operations, from better farming through shortening queues to amusement parks to development of new medicines based on data on physical and medical attributes.

CryptoRiyal will be traded, converted, transferred and distributed over the SmartRiyal platform — an online, Blockchain powered system that will continuously operate the following activities:

- Distributed collection of data from data contributors in an anonymous form with Zero Knowledge Proof (ZKP)
- Rewards (in the form of CryptoRiyal tokens) allocated to data contributors in return for data received from them
- Exchange of cryptocurrencies-to-CryptoRiyal and vice versa and support of the conversion to/from multiple cryptocurrencies
- Exchange of fiat-to-CryptoRiyal and vice versa and support of the conversion to/from multiple fiat currencies
- Fully automated processing of the data (including historical records) by Artificial Intelligence and Machine Learning techniques and generation of business and technological insights and recommendations via predictive analytics models
- Distribution of the insights and recommendations generated by the system to business subscribers and receipt of CryptoRiyal tokens for them
- Support of monetary transactions in purchase of products and services, including mobile and point-of-sale (POS) integrations.

These functions, as well as other forms of financial uses that will evolve over time, will utilize the CryptoRiyal and the SmartRiyal platform. By doing this the economic activities and financial transactions will be underpinned for Smart Cities from its very early stages of establishment and through its ongoing growth lead to the world's most advanced

mega-cities. All these activities (and many others that will be developed in the future) are based on the following economic forms: CryptoRiyal Exchange, CryptoRiyal Growth, CryptoRiyal Insights and CryptoRiyal Community.

Value Proposition

CryptoRiyal: A Monetary Standard

CryptoRiyal Exchange

CryptoRiyal tokens will be used for digital, rapid and fully secure transactions of products and services between its external clients and trade partners as well as the city's businesses and inhabitants. Doing so, CryptoRiyal tokens provide a form of money standard (i.e. a monetary standard) that can serve the population, local businesses, public institutes, tourists, importers and exporters. The main advantages of the CryptoRiyal are the rapid completion of domestic and, in particular, international transactions that are necessary for Smart Cities to collaborate with other Smart Cities around the globe.

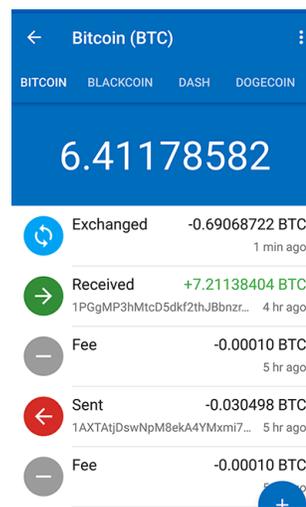
Additionally, a significant proportion of Smart Cities private and public services will be automated and by using CryptoRiyal for operating and paying for them, we support full level of automation that does not depend on fiat money handling or POS nor account management by humans. The level of efficiency is enormous, as not only do we eliminate human workers to handle trivial tasks, such as money collection and counting, but we may also operate immediately providing robotic services and automated machinery once a payment is made.

All these significant advantages in the production and the global trade of services and goods as planned in Smart Cities are enabled by the Blockchain's highly strong and sophisticated encryption level and by its distributed public ledger mechanism that manages the token surplus in crypto-wallets.

CryptoRiyal Cryptocurrency Wallet

A Cryptocurrency wallet is a software program that stores private and public keys and interacts with various blockchain to enable users to send and receive digital currency and monitor their balance. CryptoRiyal Cryptocurrency Wallet is an easy to use and based on intuitive UI to ensure that users can access all their available digital currencies in one place. The multi-currency compatibility (ERC-20, Bitcoin and several other digital assets) ensures that users can track, manage, send and receive all their digital assets from within one interface.

The wallet is linked with SmartRiyal platform to ensure that payments from IoT devices staked by users are remunerated directly and instantaneously. To access the portal that holds network information, account holders must possess a minimum number of CryptoRiyalTokens in their digital wallet. In doing so, basic access to dashboards, heat maps, tracking of asset production, and other functionality will be granted. Initially the wallet is available in Online (linked to SmartRiyal platform), Desktop and Mobile (iOS/Android) formats with plans to introduce CryptoRiyal hardware wallet in the future.



CryptoRiyal Data Wallet

Powered by DataSaaS, CryptoRiyal Data Wallet is a digital wallet for securely storing all IoT data. It allows individuals and organizations to manage the data from their IoT devices from one platform. The CryptoRiyal Data Wallet is secure, encrypted and private by default giving users the power to choose which data item they store, track, trace, manage and stake to be monetized.

As a digital ledger, blockchain allows for data storage of any kind. To avoid overloading the limited bandwidth of these nascent systems, larger data sources can be linked via hash to tools focused on distributed data store, such as IPFS. The data is stored within

decentralized nodes powered by IPFS for storage and MQTT (Client - Server publish/subscribe messaging transport protocol) for efficient, fast and secure data movements within Machine-2-Machine and IoT devices.

Using the CryptoRiyal Data Wallet, users can get real time control over their IoT devices through a web and a mobile interface. Users can remotely browse the status of their devices, the balances and analytics. This data wallet would be design-first and focused on a modern and intuitive user-experience and user-design. The wallet would be fully integrated into the CryptoRiyal architecture, allowing for IoT acquisition and monetization to pass through these wallets. Further, data assets may be converted to tokens and then into fiat, giving real-world value to IoT and other system assets. Finally, the wallet would support various payment gateways to enhance usability and user-experience, such as credit card, fiat, and cryptocurrency.

The web-based solution would be powered by React with Node.js using a Windows Server for hosting. Solidity, the Ethereum programming language, will be used for integration with the Ethereum Virtual Machine (EVM) for crypto token transfers. The Android wallet will use the Android SDK and the iOS Wallet will use Swift with iOS SDK.

Decentralized Storage

The CryptoRiyal Network utilizes the CryptoRiyal Token to incentivize business and consumer devices to act as decentralized storage nodes. Because the availability and reliability of storage nodes has a massive impact on the CryptoRiyal Network availability and cost, it is imperative that storage nodes are incentivized to maintain stable connections. Using CryptoRiyal Tokens as an incentive will favor stable and consistent storage nodes that accurately store data.

Any data monetized via CryptoRiyal Data Wallet is paid in the form of CryptoRiyal Tokens and instantaneously reflected in CryptoRiyal Cryptocurrency Wallet.

CryptRiyal Community

CryptRiyal Game

The team at CryptRiyal believes that Cryptocurrency adoption for masses has to be made exciting and fun which is why instead of *boring* Airdrops, CryptRiyal is introducing a CR Game inspired by *PokemonGO*, the AR based game. CR Game will enable users to use pings and GPS to do treasure hunting of CryptRiyal Tokens.

The game will be available on iOS and Android and will be free to use and will be built using Google Maps and upon unlocking CryptRiyal treasure, the funds will reflect instantaneously in CryptRiyal Wallets of the players.

CryptRiyal Marketplace - E-commerce Store

E-Commerce lies at the heart of globalization and accounts for 23% year on year growth. The Smart Cities of tomorrow will rely even less on the brick and mortar store which is why CryptRiyal Marketplace is essential for Smart Cities. It will provide an online store powered by CryptRiyal token to enable a peer to peer e-commerce marketplace for token holders to buy and sell their goods and services using their CryptRiyal tokens or Fiat currency. The marketplace will have off-chain and on-chain components and will be decentralized and enable anonymous transactions and will be linked with CryptRiyal Wallet.

Smart Riyal Academy

Knowledge is multiple by spreading and innovation is the inspiration and ultimate goal and leading principles of the CryptRiyal. A portion of the funds generated with the help of CryptRiyal-facilitated transactions will be used to establish the SmartRiyal Academy – a school for basic and advanced training programs of chosen Smart Cities professionals in Python, Big Data, Data Science, Cloud Computing, Artificial Intelligence and Blockchain.

CryptoRiyal Growth

CryptoRiyal Investment Platform: A Financial Means for Investment

In order for Smart Cities to truly excel in science, technology and industries, it is essential to develop domestic facilities, advanced skill sets within the city or keen interest of professionals to inhabit and develop them on the basis of their knowledge and experience. Both the construction of infrastructure and production plants, warehouses and supply chains as well as development of skills require substantial funds that are provided either by public or private investors. However, in many cases, investments are limited only to a small number of high-amount investors, those small sum investments from a large group of supporters proved as a significant mode of fund raising, as crowdfunding of companies, especially startups and projects that attract the public's interest repeatedly proves.

The CryptoRiyal tokens will solve the funding crunch for startups and investing seeking projects and companies by connecting high net investors to quality projects that have been through extensive due diligence to be listed on CryptoRiyal Investment Platform. The participation on the platform to list potential projects to seek funding as well as to raise finance for their projects would require platform participants to hold CryptoRiyal tokens.

The CryptoRiyal Investment Platform will substantially reduce the "search costs" needed to pursue and convince large investors to invest in the venture and will eliminate the legal and transfer costs needed to invest (and therefore make small investments impossible). The Platform will perform KYC and AML checks to insure that investors meet the regulatory compliance guidelines tailored for their local jurisdiction before bringing onboard as investors. Companies seeking funding have their own application manager section within the platform to list pitches and triage previous pitches and investment raises in one place. All due diligence requirements are also met from within the same platform to ensure that CryptoRiyal Investment Platform is a comprehensive platform for all stakeholders.

CryptoRiyal Insights: Technology Walkthrough

The CryptoRiyal and SmartRiyal platform would consist of the following elements:

CryptoRiyal Network

The CryptoRiyal Network is a membership driven network that will have standard governance protocols thereby allowing promotion of projects that aid in the building of smart city through smart utilization of the data.

Considering the huge investment and massive opportunity associated with Smart Cities, the role played by CryptoRiyal will be very important. With wide area application for CryptoRiyal, there comes a need for a framework that will have the requisite services and governable set of services that meet not only the expectations of users but regulators as well. We would be requiring the tokens not only to provide unique isolated individual services but a constellation of services that is compliant with international, financial and privacy regulations along with the compliances of standard town planning and investment.

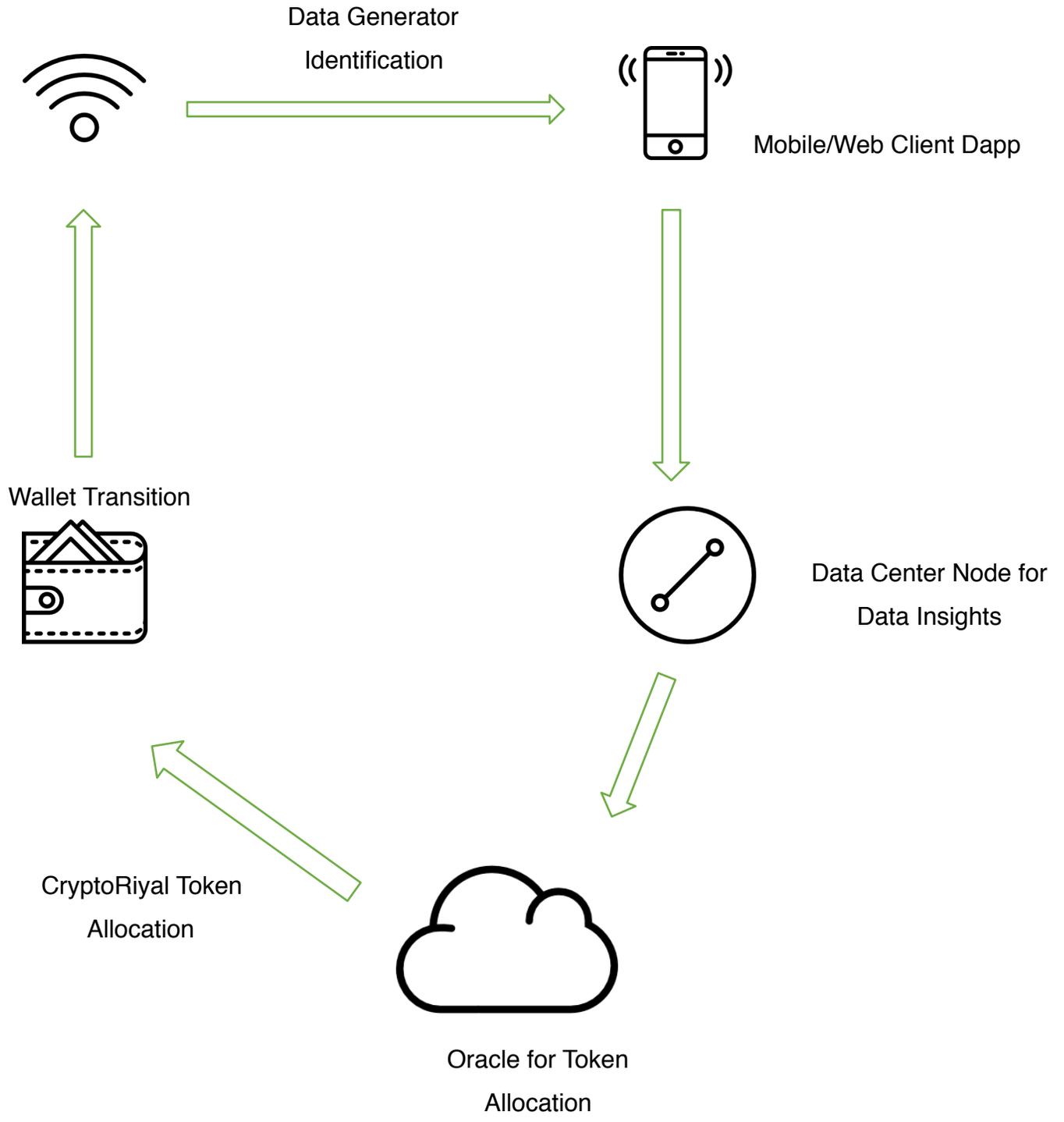
Validating Nodes

Nodes are the core blockchain element created in conjunction with the data centers. The CryptoRiyal platform will integrate with IoT devices, sensors and different data aggregators to capture data. The platform will calculate the CryptoRiyal token reward amounts through an “oracle”. This will leverage the current standard IoT hardware and data centre infrastructure and create a proof of validation of the data.

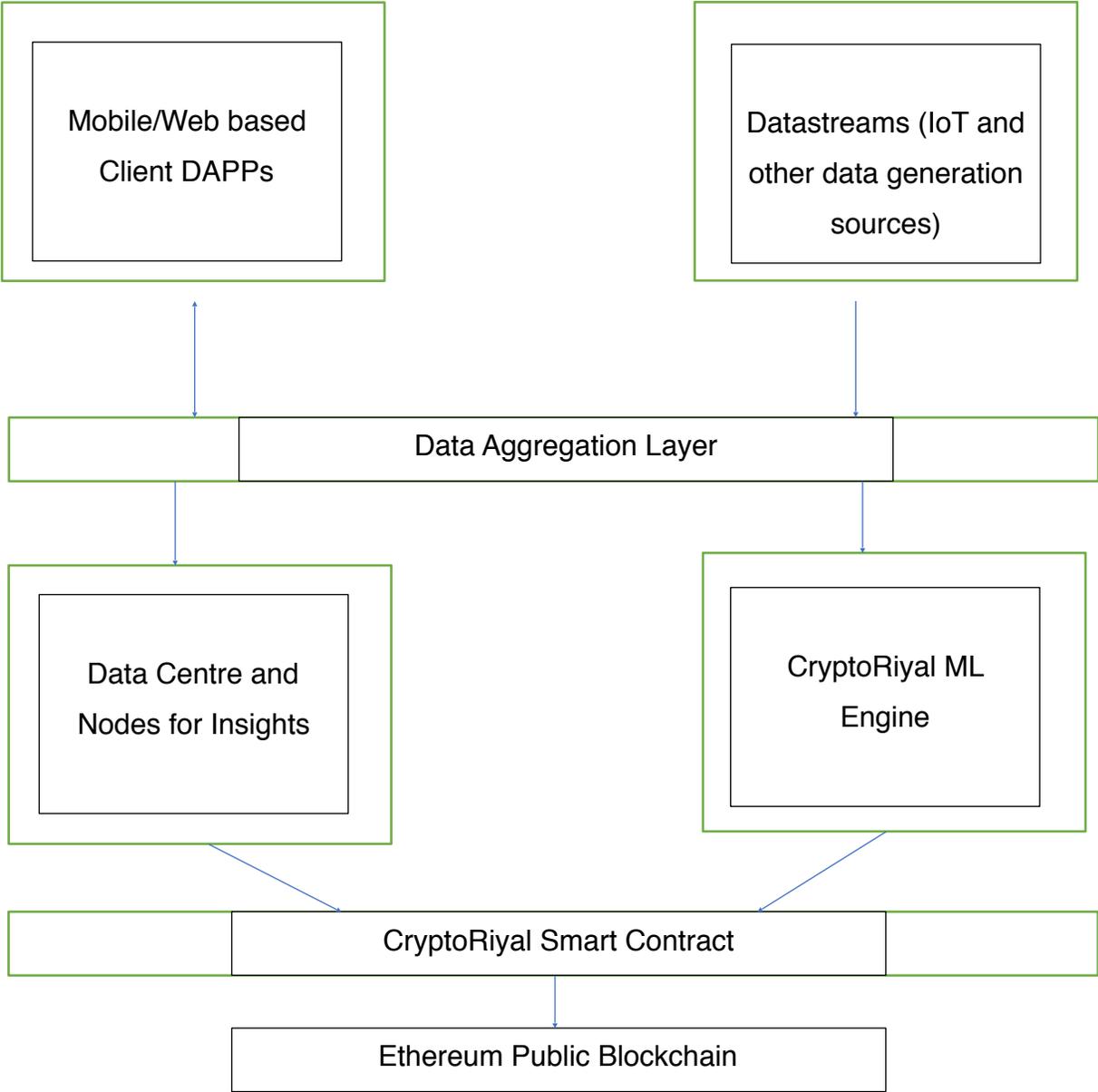
Verified Installers

Verified installers will act as a validation layer to confirm system design and receive rewards for accuracy. Validators on the network will be required to have reasonable registration requirements and perform master node functions.

CryptoRiyal Process

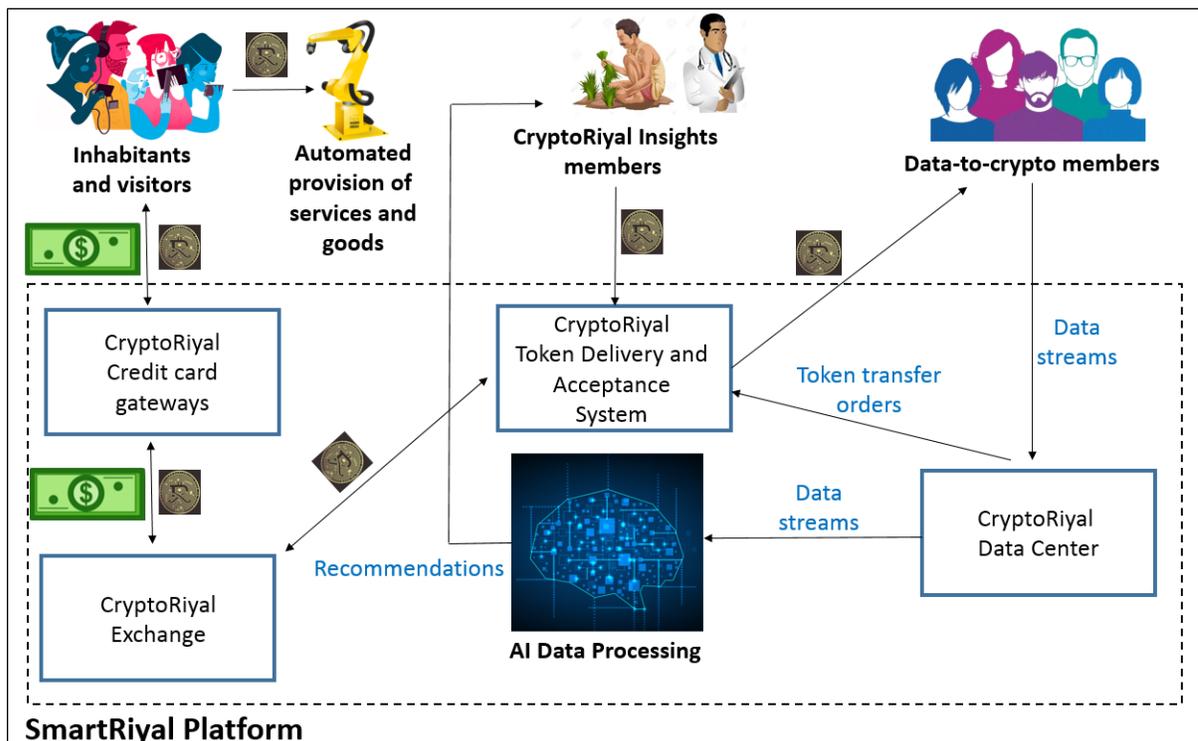


Data entered into the blockchain will then enter the “oracle” to calculate allocations of tokens and convert data inputs into smart contract tokens that form the basis of CryptoRiyal Token. The final layer is an application layer that provides users access to important interfaces about the information of the data insights created.



Platform Architecture

The architecture of the SmartRiyal platform is based on the CryptoRiyal token that manages the transfers of tokens between wallets of users, investors and companies that operate in every sector that will be present in Smart Cities. The platform offers multiple technical elements that will support the full automation of services and operations of the city, in particular in its defined priority sectors



The SmartRiyal platform and CryptoRiyal token mechanics

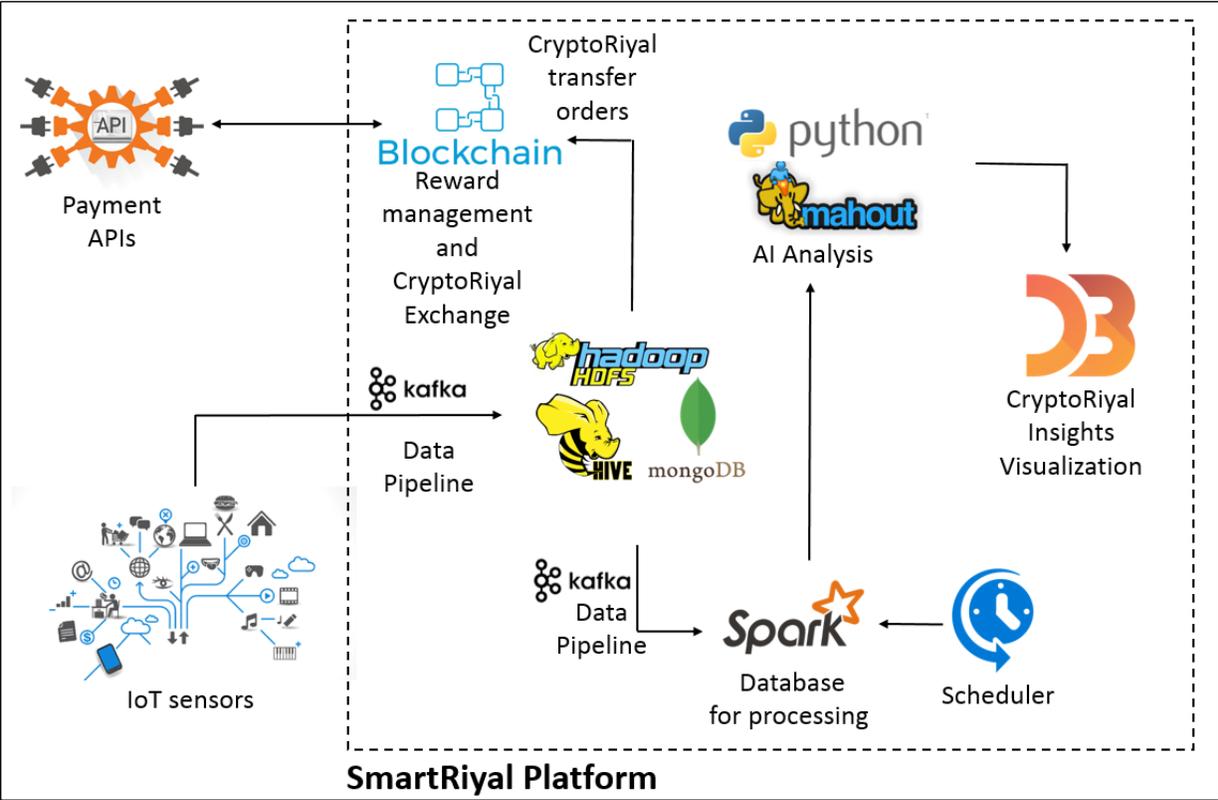
1. The SmartRiyal will operate as an ERC20 token through a smart contract on the Ethereum Blockchain. The token will support ERC20 crypto-wallets and its management (that is transfers and receipts of tokens from- and into the wallet) will be via a mobile application as well as an online platform.
2. The SmartRiyal will operate a dedicated data center that will be aimed at collecting data from data-to-crypto members and in return will issue payment orders

to the Blockchain to reward data contributors with CryptoRiyal tokens. The data transmitted to the data center will be anonymized, in order to sustain the privacy of the member. The reward will be determined on the basis of pricing models that will be developed for each sector.

3. SmartRiyal will include IoT sensors in multiple sectors, including water and energy, agriculture, crowd control and many more to collect data within its data-to-crypto program. Data will be automatically collected and transferred into SmartRiyal's data center for further processing. The data transfer will be either mobile or via cables connected to the Internet.
4. The SmartRiyal will include an AI system to analyze the data and to automatically produce CryptoRiyal Insights that can serve companies and managers in each sector to improve their operations. The system will include more than 100 Machine Learning, AI and Deep Learning algorithms that will automatically be applied according to the type of data that should be processed and the statistical properties of the data (such as distribution, variance, etc.).
5. The SmartRiyal platform will include APIs through which automated services, production and entertainment facilities will be operated upon the completion of payment transactions with CryptoRiyal. Robots serving customers, automated warehouses issuing products, entry to transportation and amusement parks are only some of the examples of operations that will initiate services upon receipt of CryptoRiyal from customers and business partners.

Infrastructure Setup

The architecture of the SmartRiyal platform is primarily based on the Blockchain, but also includes data center management components, Big Data and AI platforms that can support the wealth of its data storage and processing operations.



The data center will employ a private cloud that will enable the operation of the Hadoop framework to efficiently collect, store, manage and process data. Data from the IoT sensors will be transmitted into the databases for storage through data pipelines operated by Apache Kafka. HDFS and MongoDB will provide the database infrastructure for long-term storage of non-structure and structured data, while structured data that requires frequent access will be retrieved by SQL-Hive.

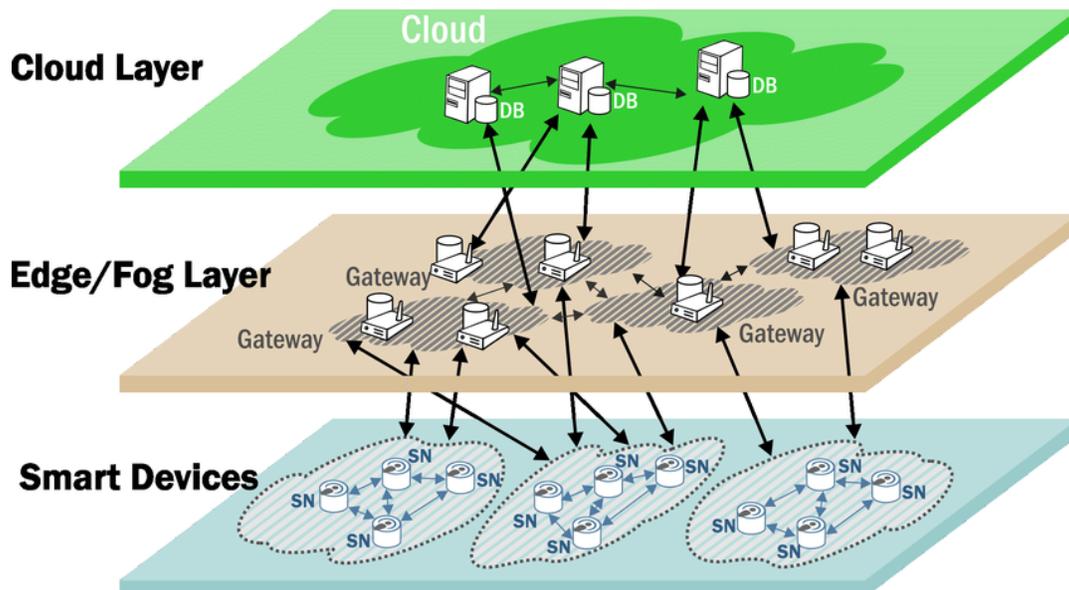
The Apache Kafka will also serve for data transfer pipelines for processing on Spark for “heavy” type of data processing, such as Machine Learning and Artificial Intelligence. SmartRiyal’s AI system will incorporate Mahout for more conventional Machine Learning

operations. Python programs that will apply advanced Machine Learning and AI algorithms, including proprietary algorithms especially developed by CryptoRiyal's experts, will complement it. Visualizations of the CryptoRiyal Insights will then be presented by applying the D3 visualization tools and environment.

The data center will generate "reward orders" that will automatically transfer tokens from the CryptoRiyal's wallet to the wallets of data-to-crypto members based on the data that they shared. The Blockchain's ledger will accordingly update the remaining amounts in the sending and receiving wallets.

Fog Computing Overview

Smart Cities powered by the CryptoRiyal infrastructure will experience massive data flow, and therefore bandwidth and compute needs. In order to process all the data flowing from IoT devices and create smart solutions in real-time, we will employ fog computing. Fog compute is an IoT gateway that crunches streamed telemetry data, putting it into a normalized format to send to cloud services that may take action upon it. This reduces overhead for cloud resources and conserves bandwidth, which are necessary requirements for smart cities.



Fog computing is similar to the more well-known edge computing, which is any compute done at the edge of a network. Fog computing consolidates the data at that edge in an IoT gateway, using cloud compute for further purposes. CryptoRiyal Token may be used as a utility here to pay for compute and storage needs, acting as a decentralized and trust-less payment system for the fog computing architecture.

Fog computing nodes will therefore be incorporated into edge computing needs, including IoT-based applications and distributed computing, and will be rolled out in conjunction with 5G to enable higher data rates, reduced latency, energy saving, and massive connectivity in the smart cities.

Token Flow of IoT Data

Fog computing acts between cloud computing and smart city & IoT infrastructure, whereby the complexity of analytics capabilities at fog computing nodes also lies between the two, having implications on token flow.

Machine Learning approaches at the cloud computing level are virtually without limit, including techniques such as deep learning, deep reinforcement learning (Deep RL), semantic learning, and data mining, as traditional servers can scale more easily. At the middle level of fog computing, nodes are better geared in terms of compute ability to process compressed deep learning and semi-supervised learning. At the most basic level, the IoT infrastructure may process shallow learning and unsupervised learning.

Data flow begins at the base level of IoT infrastructure, moving either to fog computing or cloud computing nodes, depending on the complexity of analytics needed. Fog compute nodes also allow for more data analytics and storage, so data may flow again from fog nodes to cloud compute nodes, and actions will always flow back down to the IoT infrastructure, as seen in the diagram below (Courtesy of ResearchGate).

Application Areas for Fog Computing

Fog computing allows for any compute done on traditional networks, but with the advantages of being closer to sensors and devices, saving computational resources. This also includes personalized experiences, as personalized analytics and performance for every device in a smart city would have huge computational requirements, but bringing the compute closer to the devices would enable this. Further, cognitive computing on the edge will be brought closer to sensors, such that a far greater number of intelligent devices can exist on the network. Machine-to-machine communication will also be feasible on a larger scale, as data and compute needs can be dynamically allocated at scale.

Fog Computing Linked to SmartRiyal Platform

The fog computing nodes would be fully incorporated into the membership driven CryptoRiyal Network, whereby the data and analytics would follow established governance protocols to promote the building of the smart city.

Applications in the SmartRiyal platform, such as Smart Contracts and integrated DApps, may use fog computing nodes for compute and data flow. Further, mobile/web based clients may access compute in fog nodes by paying with stored tokens, thereby creating utility in the token for both clients and fog nodes.

Mining to Support Compute

Within the CryptoRiyal network, business and consumer devices are incentivized to provide compute assistance to cloud, fog, and other compute nodes in return for CryptoRiyal Token. As a result, devices become interdependent, and the utility of the CryptoRiyal Token would be closely linked with the compute needs of the network. As the network grows and devices are added and further linked, linked devices, mining, and CryptoRiyal Token would reach a network effect of mutual growth.

Team and Organization Structure

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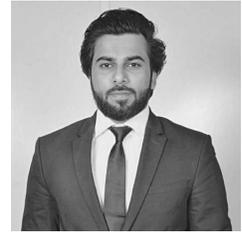
Bander Al'Otebi
Chief Operating Officer



Alexander Ressos
Chief Legal Officer



Majdi Abdulaziz
Chief Strategy Officer



Talal Riaz
Director Business Development



Dan Litwak
Senior Security Advisor



Nasser Al Harathy
Chief Logistics Officer



Fahad Khan
Advisor



Vijaya Bhatt
Fullstack Developer



Mohammad Abusitta
Blockchain Engineer



Vishal Waman
Technical Project Lead



Andrey Romanov
Marketing Specialist



Metallag Youcef
Media Advisor

ICO Details

CryptoRiyal Token (CR)

Parameter	Value
Name of the Token	CryptoRiyal
Symbol of the Token	CR
Total Number of Tokens	2,000,000,000
Number of decimal places the token allows	18

Token Allocation

Entity	Percentage
Token Sale - Public	33%
Advisory	5%
Bounty	1%
Team	10%
SmartRiyal, CryptoRiyal Exchange and Investment Platform	25%
CryptoRiyal Treasury	26%

Use Cases Of CryptoRiyal

Smart Cities Applications

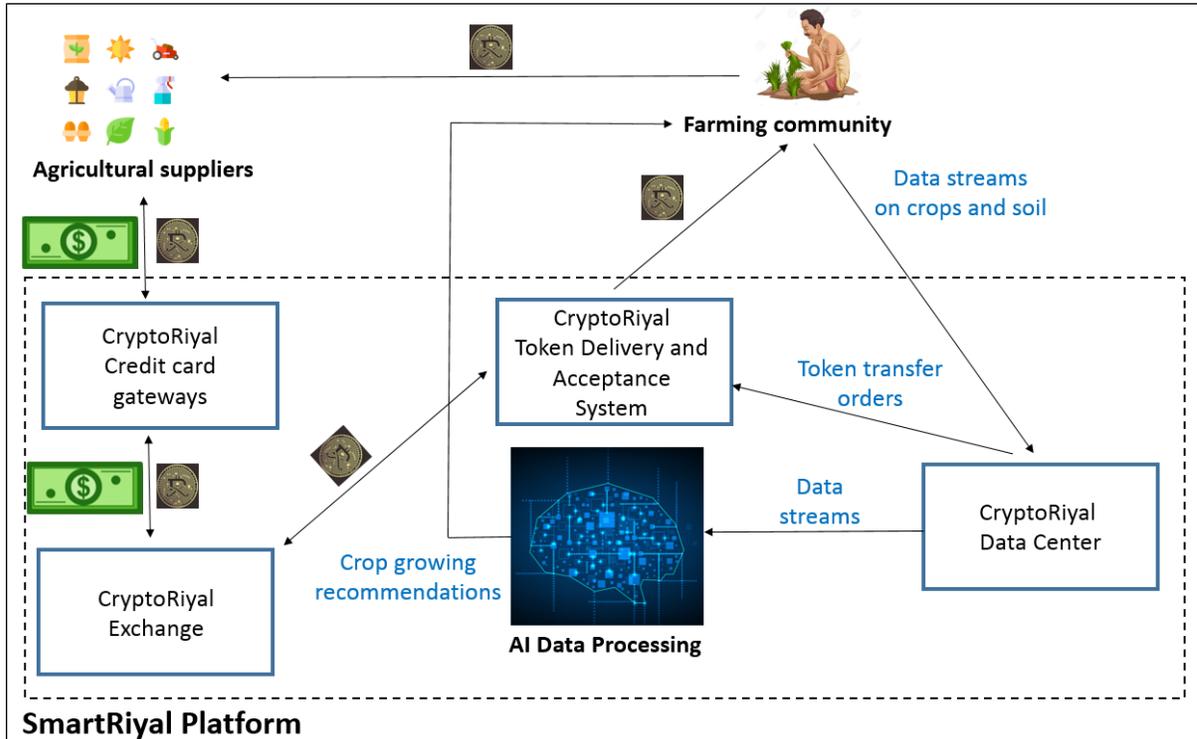
Smart Cities will represent a new world center of technology and business. A smart city will not be just a technology park, but it will also be a luxury destination for life and tourism with shopping centers, restaurants and entertainment centers. On the site of this project will be included magnificent marinas, amusement parks that will not only be the largest in the world but also non-transparent and the like. As such, the industry is able to produce and supply goods and services at globally competitive prices. In addition to the expansion of business sectors that enhance the economy of the larger nation, Smart Cities aims to develop the following key economic sectors and living conditions that will form the foundation of the future of human civilization:

- Agriculture and food
- Energy and water
- Mobility
- Biotech
- Advanced manufacturing
- Media
- Entertainment

These target sectors will encourage economic growth and will deepen the production of innovation and new technologies, as described below.

Agriculture and food

When it comes to building Smart Cities, some of the major challenges are the techniques in which water will be produced, flora will grow and fauna will live, especially as smart cities may be located in harsh climates such as deserts. The production of fresh water is the main issue and is regarded as a global issue as well. What is certain is that Smart Cities will find the solution and the key to this problem, as it is essential for the livelihood of the city. The solution to this problem lies in the latest technology, the breeding of seawater, developing innovative ways to plan and manage irrigation, facilitating extensive water conservation, more effectively allocating their scarce resources as well as the maintenance of greenhouses on solar energy.

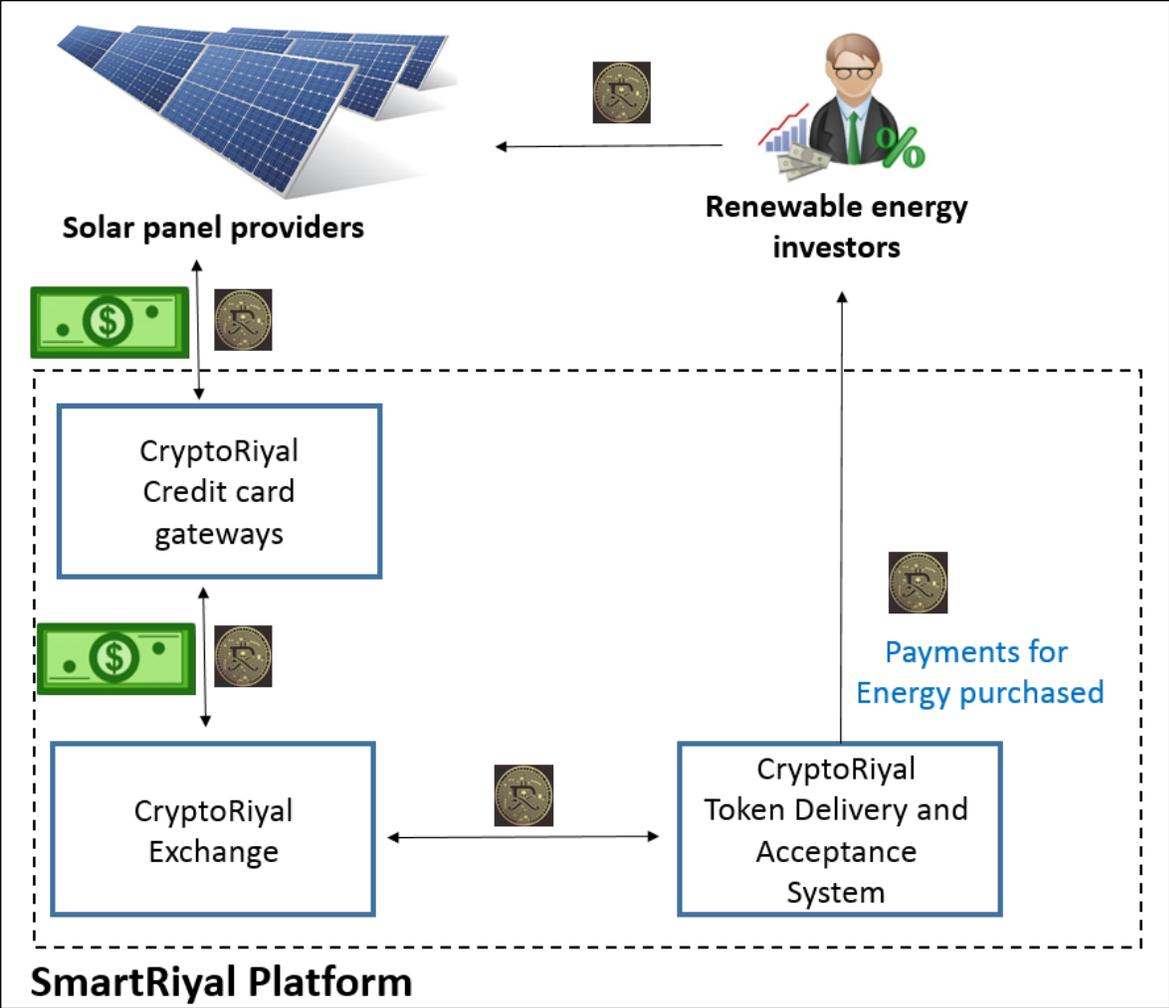


The food production is another challenge that Smart Cities are fully adapt to overcome using the concept of vertical agriculture and technology to increase food production to its population in an efficient way. The future of food includes an international innovation center for food technologies, including seawater and desert farming and advanced aeroponic and hydroponic technologies of agriculture.

The tokenomics in the agricultural sector works as follows: Farmers can provide continuous data streams about the condition of the soil, the crops, the water, etc., by automated systems of sensors installed in their fields and farming facilities and be paid for them on the basis of the data-to-crypto program. In return, they can purchase agricultural recommendations from the AI based SmartRiyal platform that automatically processes, analyzes and learns from the data of all farmers that participate in the program. These CryptoRiyal Insights are delivered to the farmers that pay for them with CryptoRiyal tokens to continuously improve the performance of their farms. Farmers can also use CryptoRiyal to purchase supplies from agricultural suppliers with the CryptoRiyal E-Commerce platform. The suppliers can then keep the CryptoRiyal tokens that they receive in their wallets, pay with them for supplies or convert them to fiat money via the CryptoRiyal Exchange and its payment gateways.

Energy and Water

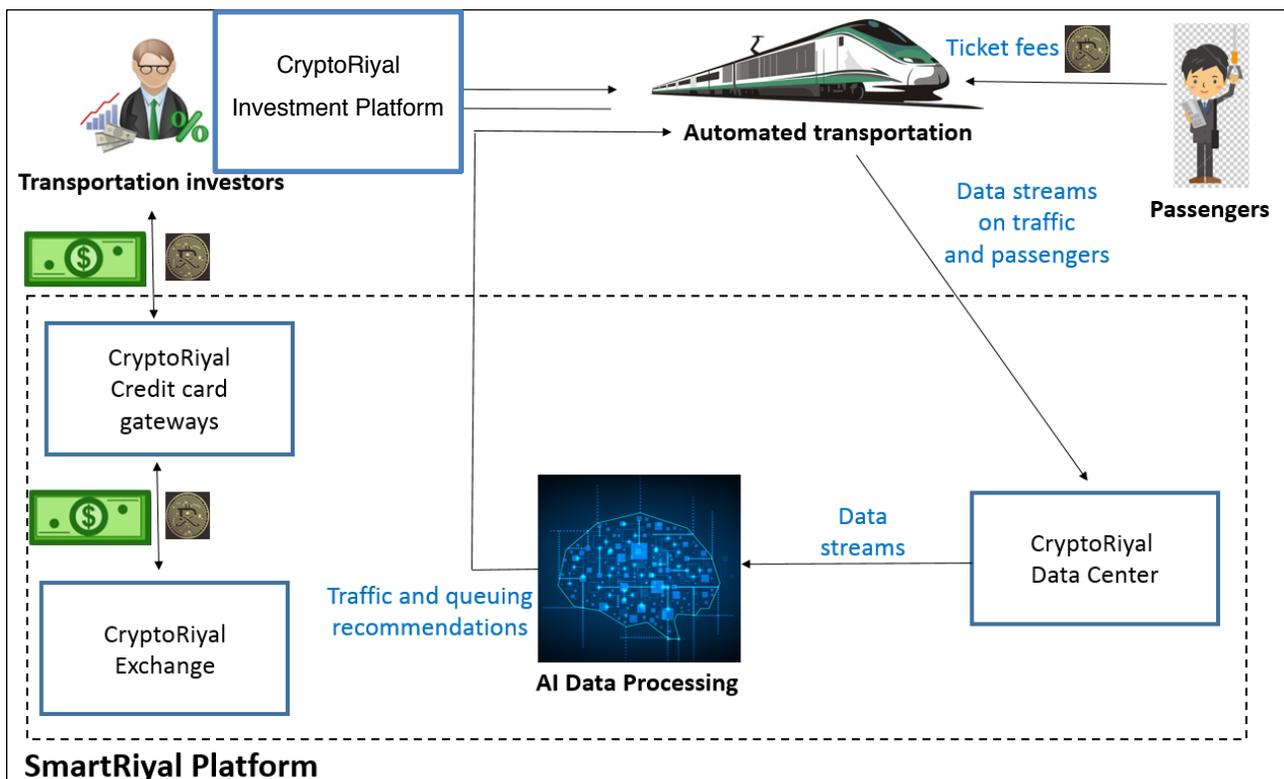
The next interesting question is how metropolises will solve the challenges of energy transition. Energy security is an important issue, given the changes in oil prices and the growing demand for energy. Thereupon, energy diversification policy that includes renewable energy and energy issues in cities are both relevant for the future of Smart Cities. These aspects trigger social mobilizations that have proven to be powerful and have encouraged governments to consider cities as factors that are important for energy management (Verdeli, 2018). Clean energy is at the top of the list of priorities for Smart Cities, with large solar and wind power plants that are planned to supply its energy needs. All these measures are sufficient to supply the entire needs of Smart Cities with low cost regenerative energy sources that will enable a high degree of air purity and environmental stabilization. Smart Cities will be a pioneer in the future for the production, use and storage of various types, as well as new types of energy.



The tokenomics for renewable energy growth on the basis of CryptoRiyal use in Smart Cities works as follows: Investors in renewable energy will invest in a participating Green Energy production companies via CryptoRiyal Investment Platform. The electricity produced by such Green Energy production companies will be sold to the Electricity Companies and the investors will be paid with CryptoRiyal tokens.

Mobility

Smart Cities will pave way for connected and eventually autonomous cars. In order for fully autonomous cars to become a norm, it is important for Smart Cities to have all cars and roads connected. The future mobility opportunities include seaports, airports, autonomous transport solutions, such as autonomous vehicles/drones, and other forms of transportation. Smart Cities mega-city project will most likely allow only electric vehicles to operate within its confines.

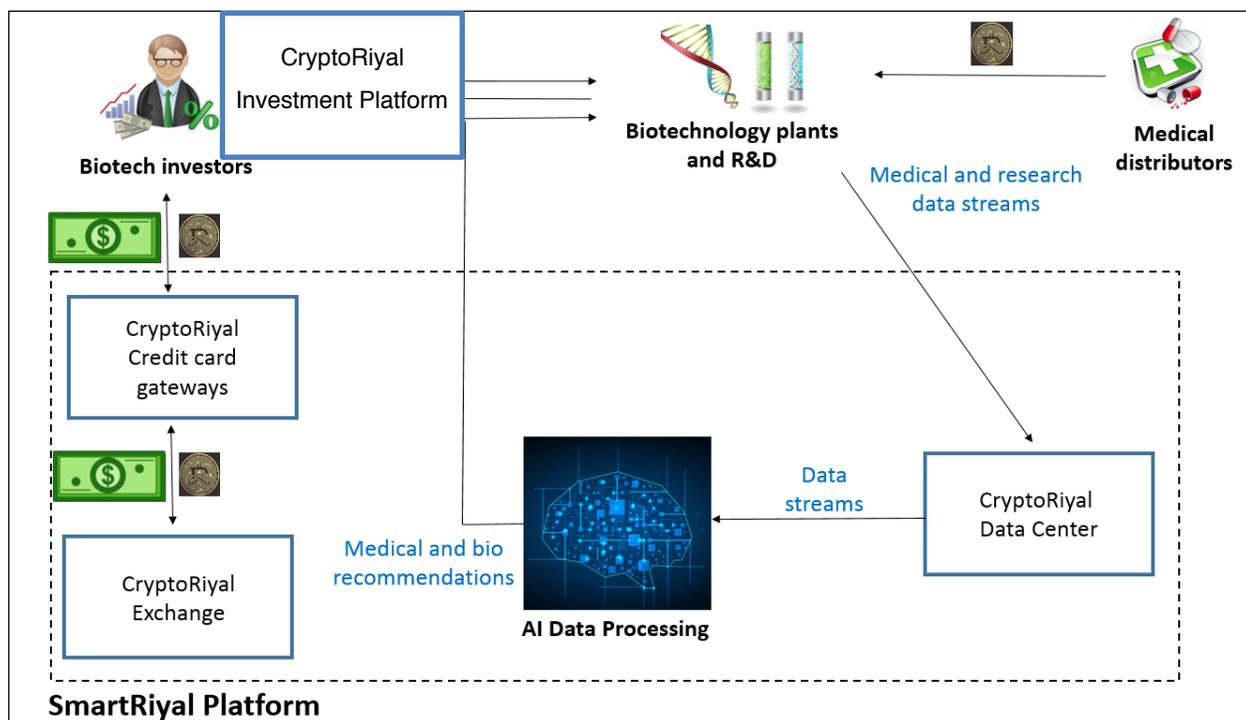


The tokenomics of the transportation projects in Smart Cities works as follows: Public and private investors will develop the infrastructure of automated transportation and list their projects on CryptoRiyal Investment Platform. Investors will receive returns, as a proportion of the revenues of their transportation facilities, in the form of CryptoRiyal, thereupon facilitating additional investments in mobility and transportation. Additionally, data on passenger use and traffic and from IoT based connected devices will be continuously analyzed by the SmartRiyal Platform to generate recommendations that

will continuously improve the queuing and waiting time of passengers, the transportation scheduling and the services provided to them.

Biotech

As the world seeks new genetic therapy, genomics, stem cell, nanobiology and bioengineering based treatments, Smart Cities is planned to play a major role in facilitating these developments. The new city will design its regulatory framework for attracting high-tech businesses, especially in areas of biotechnology and will cater to its R&D and advanced industrial and technological needs. The city aims at stimulating innovation, where top scientists around the world will be invited to conduct research in the fields of medical science, biotechnology, human biotechnology and pharmaceuticals manufacturing.

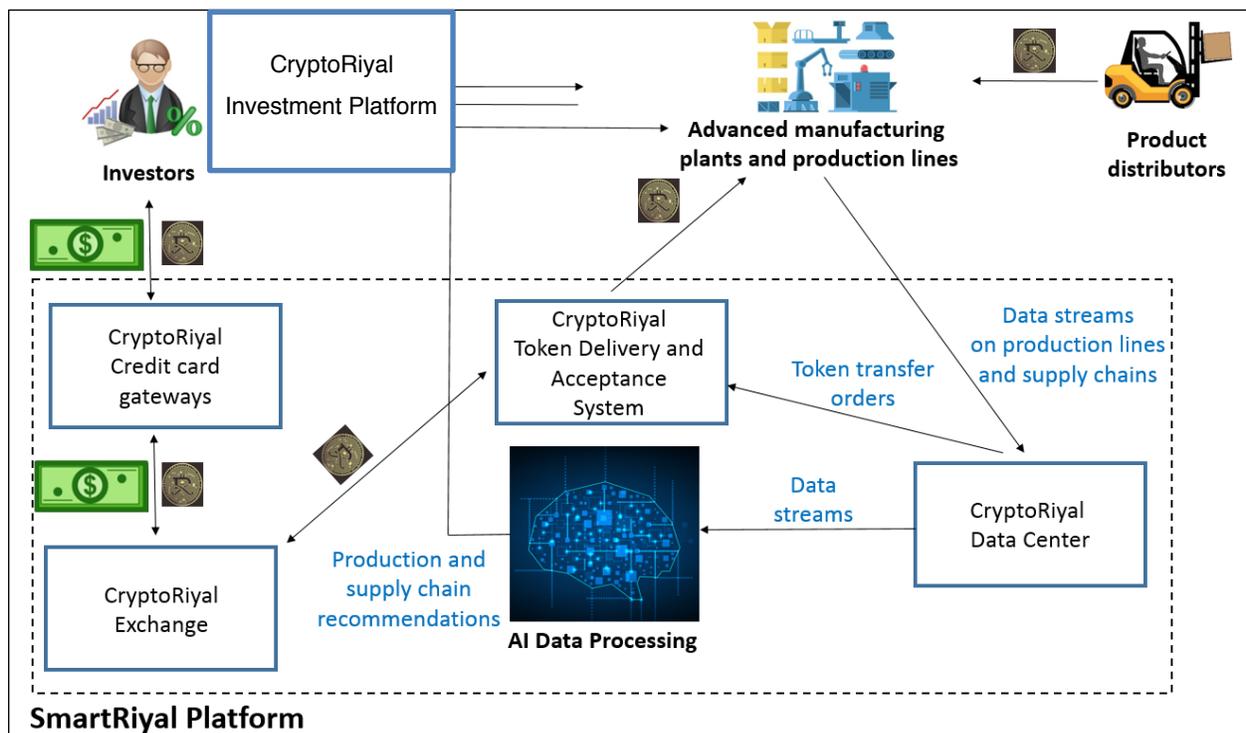


Investors will invest in acquisition of world talents and leading professionals in biotechnology and medical research and in development of clean production facilities, state-of-the-art laboratories and logistics infrastructure and list their projects for seeking funds from public on CryptoRiyal Investment Platform. The products and treatments

produced and sold will generate streams of income for investors and will be paid in CryptoRiyal tokens from medical distributors as financial returns to investors in CryptoRiyal. The growth and prospering of the biotechnology sector in Smart Cities and the returns paid to investors will facilitate the growth of biotechnology innovation. The growth will also be supported by the ability to analyze medical and R&D data collected from patient files and from the labs via the SmartRiyal AI system to identify efficient and innovative medical treatments and medicines.

Advanced manufacturing

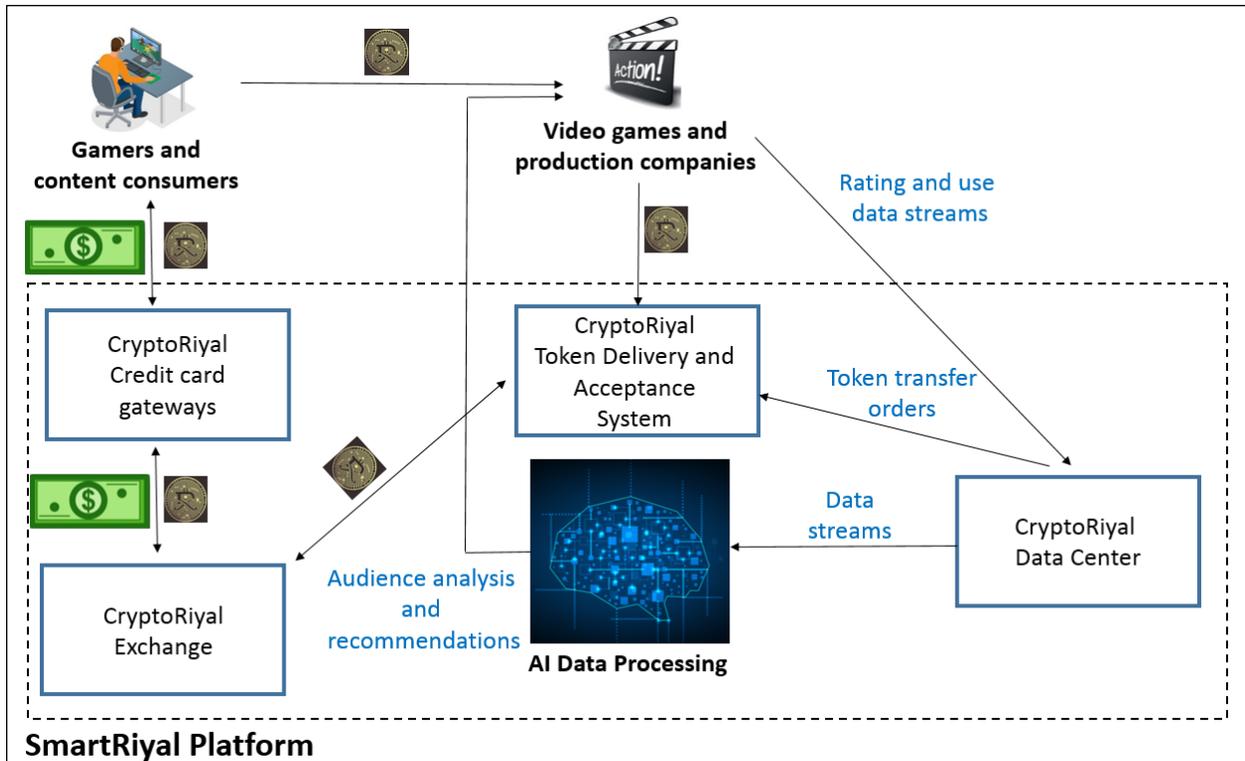
Smart Cities will produce novel innovations in nanotechnology, 3D printing, sensors, IoT devices, robotics, supply chain technologies and more by leveraging robotic process automation. It will also support research in related areas, such as supplies, transportation and infrastructure development. Another aspect that Smart Cities will develop is the testing of inventions, such as personalized, fully automated transfers from point to point, passenger unmanned aerial vehicles and their perfection.



The economic dynamics of the agricultural sector is as follows: Investors will invest in fully automated and advanced production facilities that will include robotic production lines, automated delivery, automated warehouses, etc., on CryptoRiyal Investment Platform. IoT sensors will be installed on the multiple production facilities to collect the data on the performance of all the supply chain elements. The data will be transferred to the SmartRiyal data center and, in return, owners of the advanced production facilities will be rewarded with CryptoRiyal tokens for staking their data in CryptoRiyal Data Wallets. They will be able to purchase CryptoRiyal Insights with production and supply chain recommendations from the AI based SmartRiyal platform that automatically processes, analyzes and learns from the data of all the production facilities that participate in the program. The product distributors will pay to the producers with CryptoRiyal tokens for their product purchases, which can be kept as tokens in CryptoRiyal Cryptocurrency Wallet or converted to fiat money via the CryptoRiyal Exchange.

Media

The future of media in Smart Cities includes the development of the entertainment, video game industry and provision of new and innovative digital contents. The most prominent content creators will be concentrated in Smart Cities to leverage the technological infrastructure, such as production houses, studios to produce, deliver and distribute films, TV, music, video games and social media at the highest level.

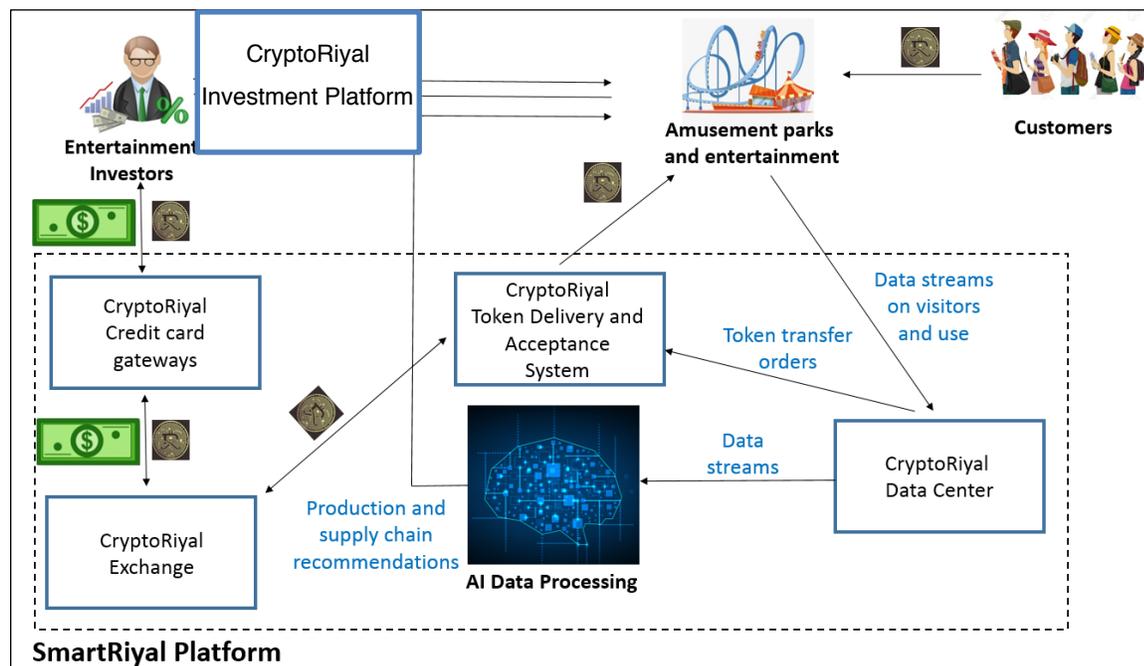


The tokenomics of the media sector in Smart Cities is as follows: Production companies will be able to attract the top talents in their field by paying them with CryptoRiyal. Media productions and games will then be developed and sold, with payment received from gamers and content consumers in CryptoRiyal that can be purchased via the CryptoRiyal Exchange. Companies will be able also to share data on consumer habits and attributes and will be awarded CryptoRiyal tokens. The data will be collected by the SmartRiyal and processed into CryptoRiyal Insights by the AI based system. Companies can then purchase those insights with recommendations regarding their market and the customer behavior by paying for them with CryptoRiyal tokens.

Entertainment

The future of entertainment is clear: they will become smarter, more connected and fully part of the Internet of Things within the Smart Cities. As smartphones connect the physical world, and cheap sensors and chips provide cloud-connected brains to animate any previously inanimate objects, including toys and other physical entertainment

properties. Smart Cities will leveraging physical assets, such as media channels delivering personalized content and interactive services directly to consumers. The CryptoRiyal Insights can be used to create unique, connected entertainment journeys, where toys and other real world media properties drive consumers to virtual engagement.



The tokenomics of the entertainment sector in Smart Cities is as follows: Investors will invest in developing connected infrastructure, such as amusement parks, theaters, museums and other entertainment facilities by raising funds from crowdsourcing on CryptoRiyal Investment Platform. The return on such investments will be remunerated in CryptoRiyal token. Amusement parks and entertainment facilities will have automated ticketing and entrance tickets will be purchased by paying with CryptoRiyal. Additionally, entertainment facilities will benefit from the data-to-crypto program by sharing their data for the benefit of all the sector in Smart Cities and will be rewarded with CryptoRiyal. The data will be collected by the SmartRiyal and processed into CryptoRiyal Insights by the AI based system. Companies can then purchase CryptoRiyal Insights that include recommendations about customer preferences and queuing to continuously improve these aspects of their operations.

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