SkyWork Drone BlockChain Token

DRONEFLY

INNOVATIVE BLOCKCHAIN-BASED
DRONE FLIGHT OPERATION MANAGEMENT SYSTEM

White Paper

Contents

Abstract

A wide expanse of blue sea greets the eyes. Floating green islands are dotted on the sea. It's truly unrealistic sight as if I look at it while flying in the sky. Smoothly passing through the narrow caves which a helicopter can't go into there, I take gorgeous photos.
A drone is flying through the densely packed buildings. There is a scene of fire up ahead, still blowing out black smoke. This nippy little aircraft spreads out extinguishing fluid over the embers in the scene. Another aircraft searches for any survivals, taking photos of every spot of the place.

It's not like out of a movie. It's not a future story. It happens just right here of our place, and it's a real world. Everyone knows the drone show of 2018 Pyungchang Winter Olympics: more than 1,200 drones were on display graced the opening ceremony. It was breathtaking. A drone is already part of our lives. A drone is an unmanned aircraft so that it has a lot of work to do than a manned aircraft, and its usage broadens more than ever: putting out a fire, pulling out survivors, controlling the insect pests, taking pictures or investigating the remote areas. World drone market has drastically grown, and it will grow bigger than ever in the future. It means? More types of drones will be used in various categories.

A drone is an unmanned aircraft, but it's not a fully automatic flying aircraft. Someone has to manipulate the drone on the ground yet, using a remote control. An automatic flying drone will become a trend in the future, but now a present drone requires a properly-trained pilot who completed regular courses. Think about flying on an aircraft for a trip. Highly-trained pilots control the aircraft especially when take-off and landing. Generally, we take a flight because we trust a pilot who has a lot of flying experience. But is that really so? Despite people consider an air trip as one of the safest types of transportation, the number of air accidents averages to about over 3,000 yearly, and its main reason is said to be the human factor. The human factor? It means a pilot. What about the drones then? A drones is not just small and lightweight, but some drones are big and heavy: people can ride on some of them. Think about such a big unmanned aircraft flying in the sky. How important is the pilot's flying skill and flying experience of that unmanned drones? It'll be much worse, the more the drone industry grows.

There is another reason that drone flying experience is crucial. Just knowing how to fly drones is not necessary to the companies. They want pilots who have flying techniques optimized for their tasks. The pilots have a lot of flying experience? It's better! The need will grow more with the industry growth. As certified flying experience is inevitable for piloted planes noted above, certification of drone flying is highly required: the trusted system for the issue is DRONEFLY.

A business platform of DRONEFLY, SKYWORK, provides reliable flying experience data under the safe blockchain network. Participants in the network are given the rewards according to their flying experience and the flying techniques. Anyone who wants to become a drone pilot? He can get an education. Anyone who wants to do drone-related business? He can do it freely on the business platform. All the participants will get more rewards through the platform. This is DRONEFLY.

Drone Market

Today we can easily meet drones, technically called UAV, around the city. What does it mean? Drones definitely become more useful in many ways, in our daily life and in the industries. Why does the drone industry grow and expand over the globe? What benefits do the drones have? Let's check out the benefits of the drones first.

1. Industrial Benefits of Drones

A graphic below is statistical data by 2017 about the benefits of the drones.

(Source: DroneDeploy's 2018 Commercial Drone Industry Trends Report, Goldman Sach's Drones Reporting for Work Report, DJI's Public Safety Report, RISMedia, Popular Science, Time)

2. Outlook for Drone Industry Growth

Association for Unmanned Vehicle Systems International, expects the world drone industry volume to exceed $82 billion until 2025. Goldman Sachs Research forecasts the global $100 billion drone market by 2020.

(Source: Goldman Sachs Research, https://www.goldmansachs.com/insights/technology-driving-innovation/drones/)

3. Greater Demand for Drone Pilots

A drone is UAV, unmanned aerial vehicle, but it does not support fully automatic flying yet. Someone has to control the drone on the ground, and he/she should be a skilled pilot who has a lot of flying experience and expert flying techniques. It guarantees safe control of the drones. A drone pilot, also said a remote pilot, controls the drones. How many pilots are there? FAA, Federal Aviation Administration, reports 122,000 commercial drone pilots have been registered only in the US, until early 2018. Non-commercial pilots are about 878,000. The whole comes to a million drone pilots in the US.

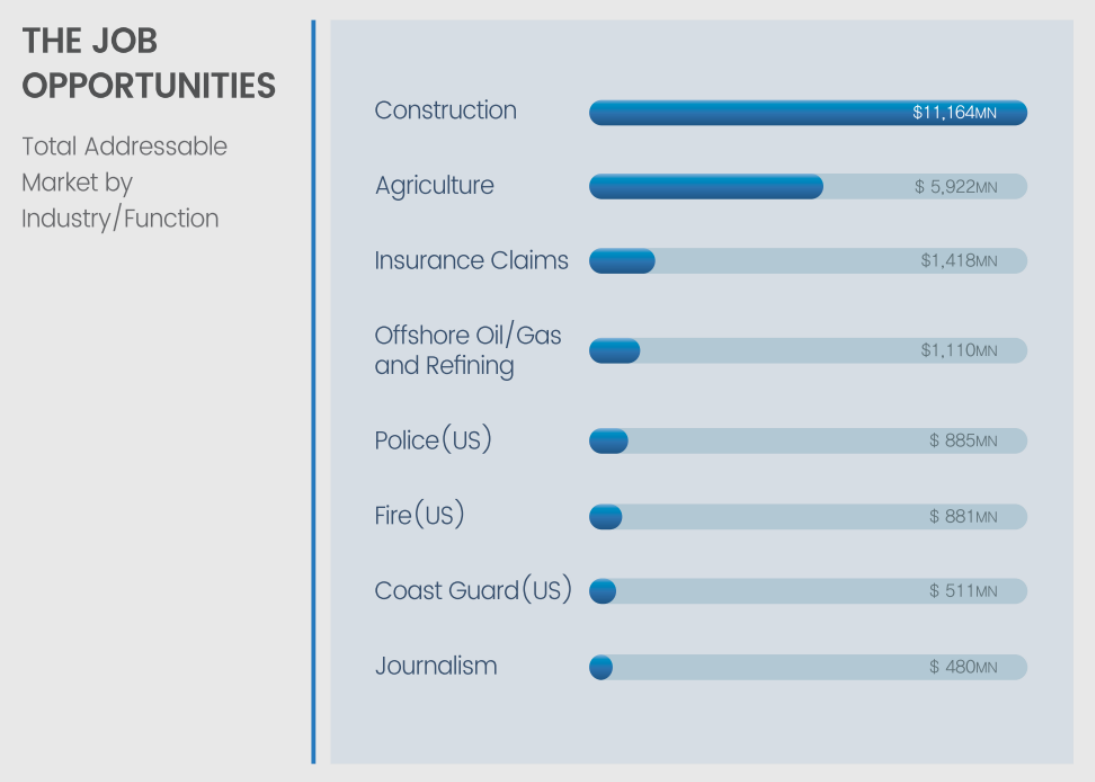
(Source: U.S. Department of Transportation, https://www.transportation.gov/briefing-room/faa-drone-registry-tops-one-million)

4. Rise of Drone-related Job Opportunities

Demand for drones and drone pilots increases every day, and the consequent drone-related job opportunities rapidly grows. AUVSI reports about 103,776 drone-related jobs will be created by 2025. FAA says over 2 million drones have been registered by late 2018 in the US. The US government made a rule that one drone pilot has to be assigned to one drone, so over 2 million drone pilots exist just in the US. FAA says the drone-related jobs will rapidly grow for commercial activities of UAVs.

(Source: FAA, https://www.faa.gov/data_research/aviation/aerospace_forecasts/media/Unmanned_Aircraft_Systems.pdf)

Drones variegate our industry, and the industry patterns are changing accordingly. The totally unexpected jobs such as dronography or drone videos are being created. Goldman Sachs Research forecasts over $23 billion job opportunities will emerge by 2020.



(Source: Goldman Sachs Research, https://www.goldmansachs.com/insights/technology-driving-innovation/drones/)

Problems & Solutions

In the future, an automatic flying drone will be available and it'll be able to carry out a task on its own. It will, however, take a lot of time. For now, someone has to control the drone on the ground using a remote control. The airliners such as big airplanes have an autonomous navigation system to fly through the air without a pilot's control. It's mostly executed when the aircraft flies at a high altitude, but a pilot controls the plane when take-off or landing. What about drones? Is there any moment that a drone does not need precise manipulation? No. Every moment you have to control a drone for your purpose. A drone pilot has to do it, and his/her flying or operating skills highly influence safe flight of drones. How can we know the pilot's flying skills? Let's think about the car driver's license. Suppose a person has just got a driver's license. Now, is he/she a good driver? We can't say YES. It's the same with drones. The pilot's flying skill means how long the pilot has operated, and how much he/she has. A driver's license covers a lot of vehicles, so with drone flights. Just many flying hours do not guarantee a skilled pilot. The bottom line is, that we need an integrated standard for flying experience and flying skill. Is there any place which certifies and guarantees them? Nowhere to find. That's the beginning of the problem.

❖ Problems

When we travel abroad, the airplane we take is a pilot-driven one. Why? Of course we think it's safer than without a pilot, but is it always true? Actually, the largest percentage of the airline accidents is 'man.' A commercial airplane pilot requires, on the average, at least 200 flight hours, and over 1,000 hours to work at a major airline. The problem is that the flight hours are easily faked. Ok, now, what about an unmanned aircraft? It's a lot worse. We do not pay great attention to the problems of "unmanned" aircrafts.

Let's take a deep look on two big issues:
Drone industry grows bigger, and mid-sized and large-sized drones are being developed more than before. Larger-size drones have more safety issues accordingly. Yes, how do you feel if you cannot trust the drone pilot's flight experience? A drone flying over your head may abruptly change into a deadly weapon. There are the accidents by the drones. What are the causes of those accidents? The aircraft itself? Less developed technology? Or government system? Most of all, it's caused by human error, the "pilot", just like manned aircrafts.

The other one is about specialized drone operation skills in various industries. Drone industry has grown significantly so far, and now it requires not just "flying in the air" but "controlling to each industry need". When you work in pest control, a professional drone operating skill specialized for pest control is needed. When you extinguish fire, it's the same with the case. If a hired man has drone operating skills of just what a company needs, the company will reduce costs substantially. Is it available now? The answer is NO.

❖ Solutions

The strongest tool against forgery so far is blockchain network. DRONEFLY project uses blockchain technology, too. Hold on a second. Everybody says, "I will upload the data onto blockchain and prevent forgery," but what if the data already uploaded on the blockchain network is "already forged" or "wrong"? If so, it'll be an even bigger problem. It cannot be amended. Verification process is necessary from the data collecting process, and the consequent data has to be stored in a secure network, blockchain. Accordingly, DRONEFLY has developed a data collecting device, FlightTracker® for accurate and secure data collecting. FlightTracker® is connected to a DRONEFLY application for user authentication. When the authentication finished, you stick it to a drone aircraft and collect flight information such as aircraft information, flight hours, altitude, and flight area. When flight ended, the "authenticated" and "personalized" data is stored in the blockchain network. Accurate data can be collected and stored this way. Now, "reliable" data comes from "reliable" network, so it will help us prevent drone accidents. Besides, correct and accurate flight experience data is uploaded on the blockchain, so the companies have no difficulties in recruiting the verified drone pilots.

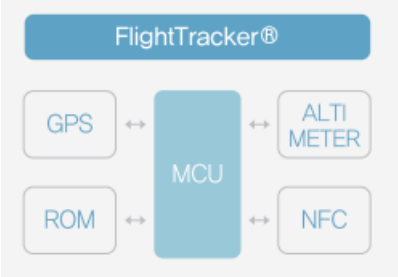
Flight data collected through FlightTracker® includes flight hours, flight areas, altitude, and SKYWORK-oriented flight skill grade as well as flight experience information. Anyone can easily view the information and evaluate which pilot is suitable for the job position. DRONEFLY's affiliated drone academies will provide various classified flight missions. If someone completes a mission and passes the test, he will get a specialized flight skill. Companies will prefer the jobseeker than any others. Jobseeker will work for the company he wanted, and the company will reduce costs, and put him in a job immediately.

KDMS : How it works

In case of collecting safe and precise flight data, we need a hardware device, a personal authentication enabled, and a systematic network which connects the collected data with a smartphone terminal to upload onto the blockchain. The system is KDMS, DRONEFLY Drone flight Management System.
FlightTracker®, an adhesive device, collects flight data on an aircraft, connects a smartphone application, and upload the data onto the blockchain network. It's a basic protocol of KDMS.

■ Step 1 | Flight Data Gathering with FlightTracker®

The very beginning is gathering flight data from a drone aircraft which is flying in the air. FlightTracker® is based on an MCU board, which includes several sensors such as GPS and altimeter. It sticks to a drone aircraft and collects flight data.
(It does not communicate with the drone aircraft: there is no standard communication protocol among a lot of drone aerial vehicles. It independently collects flight data attached to the aircraft and saved the data in ROM.)



■ Step 2 | Flight Data Store Between DRONEFLY Application & Blockchain Network

Collected flight data using FlightTracker® is transferred to DRONEFLY application, and uploaded to DRONEFLY blockchain network. When you transfer data into your smartphone application, you have to pass the user authentication process. DRONEFLY application synchronizes the user information and the user's flight data. Each flight is subdivided into an individual process for management.

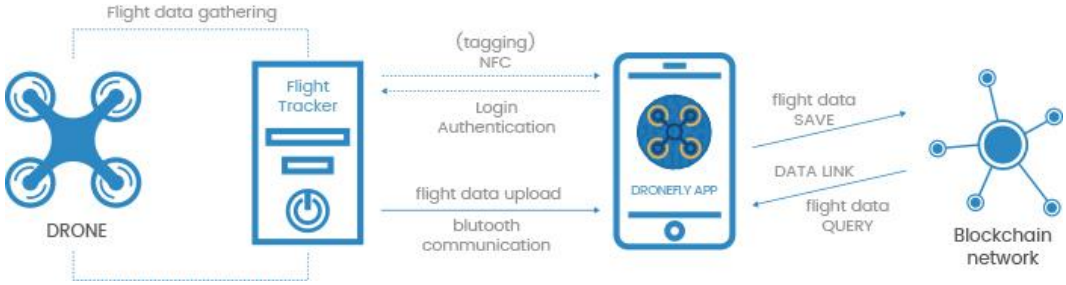


Fig.1 Flight data store flow

- Use Case: service flow from flight data gathering to storage/query

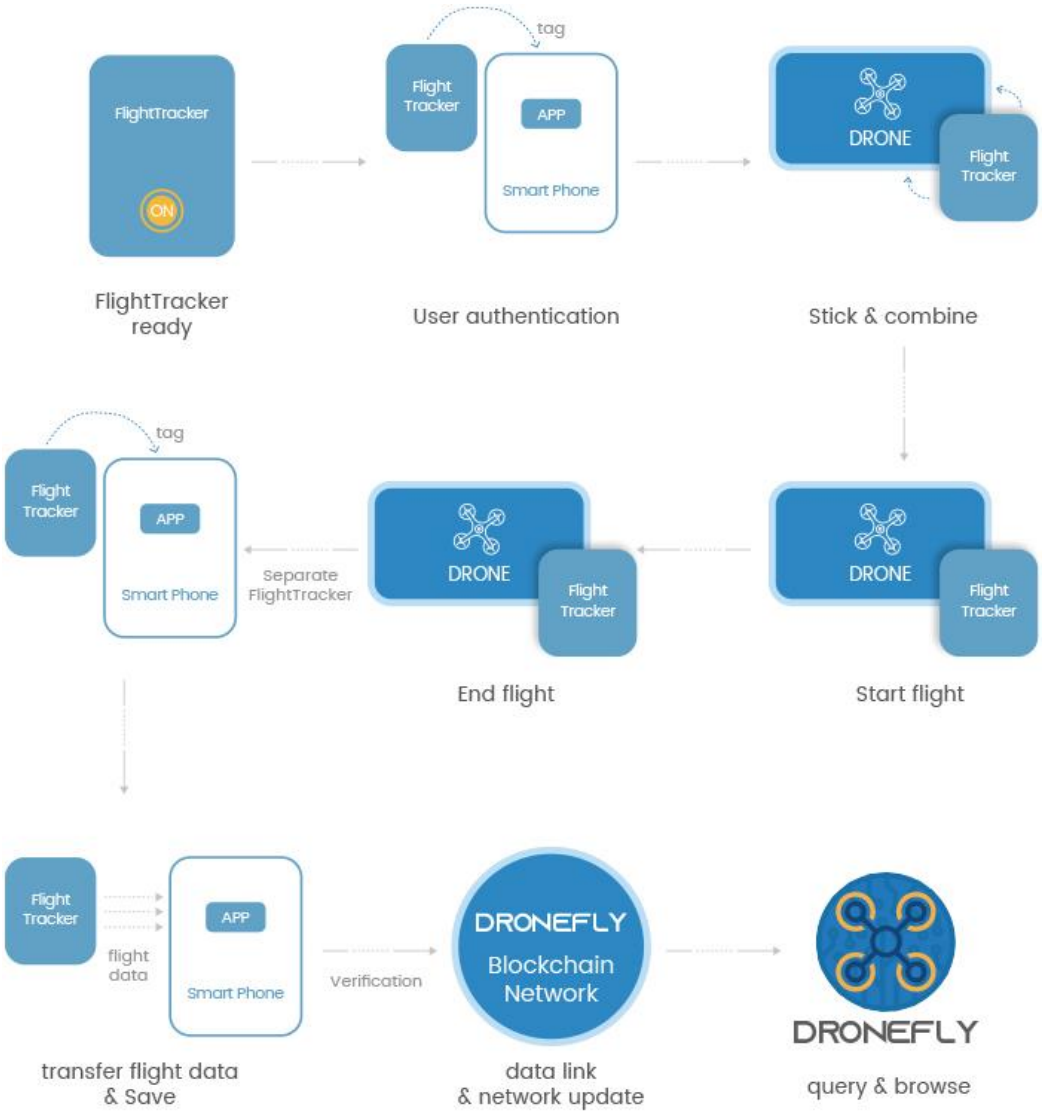


Fig.2 Flight data gathering/storage process flow

■ Step 3 | Flight Data Analysis – Based on AI and Big Data

Flight data, collected by FlightTracker® and consistently accumulated in the blockchain network, are analyzed using AI machine learning. We will provide various useful data under the analysis.

- ◆ Analyze collected/accumulated flight data with AI machine learning tool
- ◆ Analyze average flight patterns such as flight hours, consecutive flight hours, flight fidelity, etc.
- ◆ Analyze flight skills
- ◆ Analyze and recommend the optimal job positions
- ◆ Predict the accident-prone areas

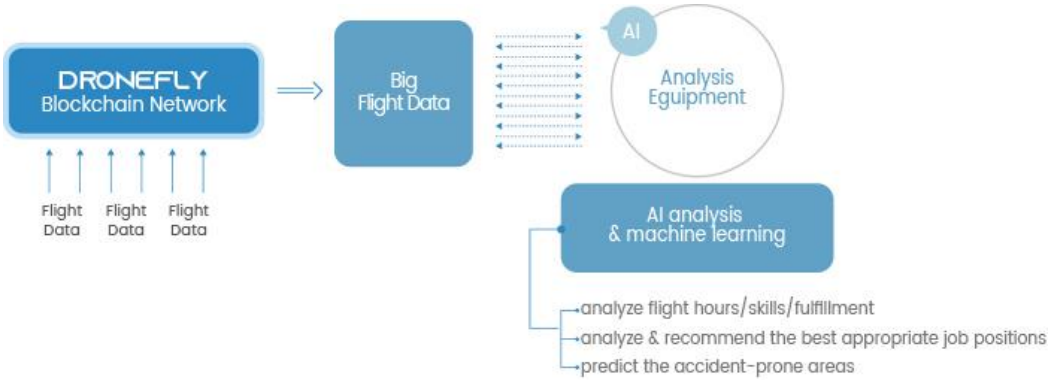


Fig.3 Flight data AI analysis

Reward Structure in KDMS

DRONEFLY participants voluntarily provide their flight data to KDMS. The data in the blockchain network is reliable and cannot be a forgery. The useful data is granted to companies, organizations, or academies. DRONEFLY is in charge of the whole system, so DRONEFLY gets fee from the users. Participants get reward for their offering, flight hours and flight skill grades.

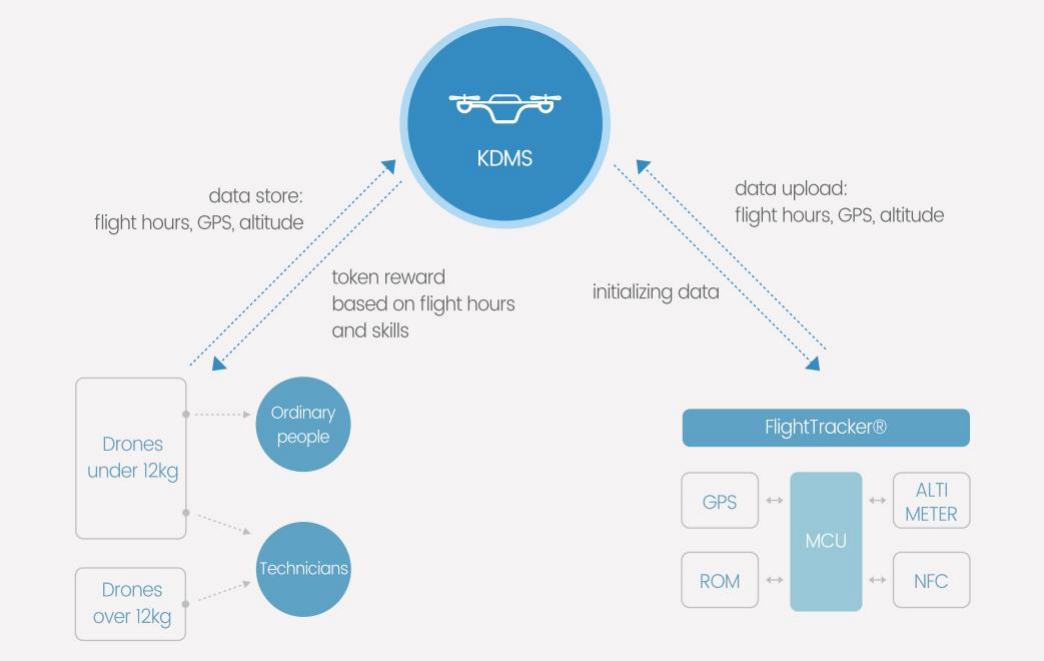


Fig.4 KDMS service diagram and reward structure

KDMS-based Business Platform

We build four different types of business platform on the basis of the KDMS participation and reward system: granted flight data of the participants are provided to various channels for its equivalent fee. We call a portal website of those platform services, SKYWORK. The basic structure of the platform is education matching and job matching, and the market and sharing platform. The four platforms work as services in the SKYWORK portal: they are organically connected to one another.

❑ Education Matching Platform

There are relatively a lot of drone learning academies around the world. DRONEFLY education matching platform connects those local academies with the participants who want to learn how to operate drones.

❑ Job Matching Platform

Drone-related companies want drone experts. Drone experts want job opportunities to work there. DRONEFLY job matching platform connects both demands. Does he/she have a required, appropriate flight experience? Does he/she have a requisite flight skill for the job description? Verification is not an option. It's inevitable.

❑ Market Platform

◆Contents Market

A drone is able to load a high-quality camera on its body to take photos or videos while flying in the air. Contents market is a place for trading the drone-generating visual contents. It enables DRONEFLY participants to upload the contents free, and make profits for trading the contents.

◆Hardware Market

Where should I go when my drone is broken? What about performance tuning? Yes, it's available in the DRONEFLY market platform. You can purchase the parts for repair or performance tuning. You can buy or sell drones in the market of course.

❑ Sharing Platform

Prices of the drones vary in sizes or battery capacity. Some drones are high-priced, so people are wavering between buying them out of their pockets and giving them up. DRONEFLY sharing platform is a good alternative for the people. An individual participant can share his/her drone for other people, or purchase a new drone for sharing. Group buying or DRONEFLY purchase is a start of sharing service, too. Basically, the drones for the sharing service are rented by hourly basis. We're going to align insurance products with the rental service.

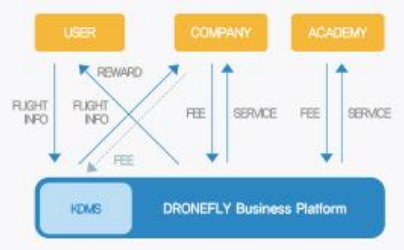


Fig.5 DRONEFLY Business Platform Network

DRONEFLY Business Ecosystem

DRONEFLY business is running over one KDMS system, connecting four business platforms with one another. Multiple services are available on a simple system. This simple structure enables us to embrace diverse demands related to drones. Participants' data is stored in KDMS, and all the business platforms receive the data from KDMS. Companies pay a usage fee, and the participants receive reward. Let's take a look at the details:

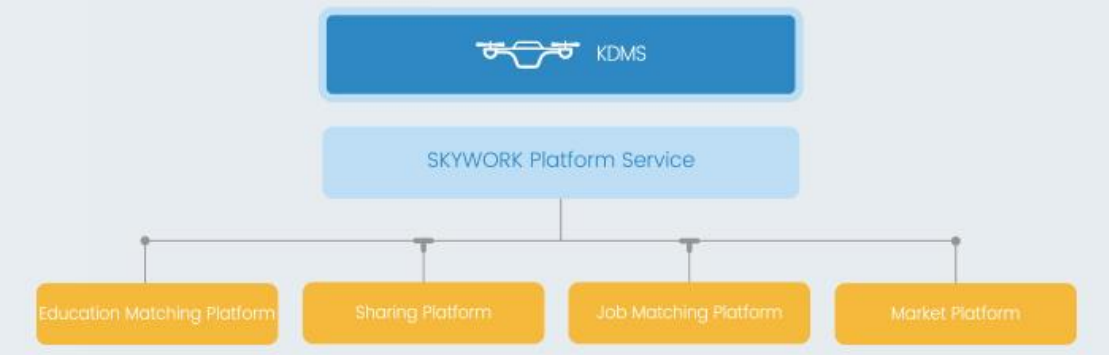


Fig.6 DRONEFLY Business Platform, based on KDMS

❑ Education Matching Platform and Training Courses

Someone wants to learn how to operate drones. Someone wants to achieve a certificate for a drone pilot. Someone wants to gain his/her drone flight experience or improve flight skills. DRONEFLY education matching platform recommends the optimal academy for each of them. Affiliated academies of DRONEFLY will provide certified courses.

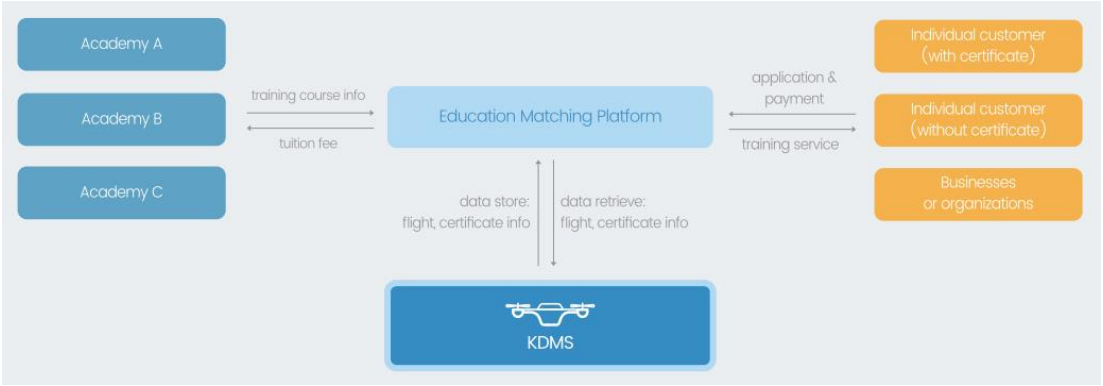


Fig.7 Education Matching Platform service diagram

❑ Job Matching Platform and Recruiting Service

Drone experts but jobseekers for drone-related jobs. Companies looking for drone experts. DRONEFLY job matching platform connects each side. Jobseekers easily find out the corresponding companies, while the companies easily recruit the certified experts in many ways.

Fig.8 Job Matching Platform service diagram

❑ Market Platform and Hardware/Contents Trading Service

As noted, people can trade drones, repair drones, or upgrade the performance in the DRONEFLY market platform as well as trade the visual contents generated by drones. It's an integrated hardware and contents trading system.

Fig.9 Market Platform service diagram

◆A primary payment method is DRONEFLY token: it is mainly used in payment.

◆We will open a contents showcase channel to enlarge the market platform, and support the contents creators such as YouTubers. It will soon extend to advertisement earnings.

❑ Sharing Platform and Rental Service

Except microdrones, bigger drones than medium size are quite expensive. The expensive drones have, however, more robust performance to satisfy the drone lovers. There is a big demand for high-priced drone rental service. Someone may want to just experience an expensive, high-performance drone. DRONEFLY sharing platform enables people to group-buy or share the drones. More people can experience the expensive drones at an affordable price.

Fig.10 Sharing Platform service diagram

◆A drone aircraft for DRONEFLY sharing is rented on the hourly basis, and the users pay the fee in DRONEFLY tokens.

Token Model

DRONEFLY token model is designed for all the participants to be very active: they can get reward in various ways.

❖ DRONEFLY
[DEFINITION]
DRONEFLY is used as a basic medium of exchange within DRONEFLY ecosystem. It is listed on the cryptocurrency markets, and can be used as a store of value.
[USE]
DRONEFLY is mainly used as business platform payment within DRONEFLY ecosystem. Most of the payment is given to the participants as reward. A participant may use the DRONEFLY tokens for platform payments, or for storing/exchanging values. This way, DRONEFLY token is constantly used and recycled within the ecosystem.

❖ KY
[DEFINITION]
KY is a convertible token with DRONEFLY token one for one. It is not listed on a cryptocurrency market, but can be exchanged only in the DRONEFLY platform.
[USE]
It's mainly used for staking within the DRONEFLY business platform. In some cases, DRONEFLY business platform may require the business participants to stake assets, KY in this case, under the preset contract conditions.

❖ KY-POINT
[DEFINITION]
KY-POINT is a volatile point which is provided as a reward for various contributions such as flight data collecting, flight data verifying, or community participation. The more KY-POINTs you accumulate, the more DRONEFLY tokens you will get.
[USE]
It's used for receiving the designated DRONEFLY tokens.
[POLICY]
Accumulated KY-POINTs, in a term policy, are converted into DRONEFLY at a preset rate and given to participants. All the KY-POINTs are initialized after conversion. The exchange rate will be noticed on the website.

❖ Mutuality
DRONEFLY, KY, and KY-POINT have a following mutual relation:

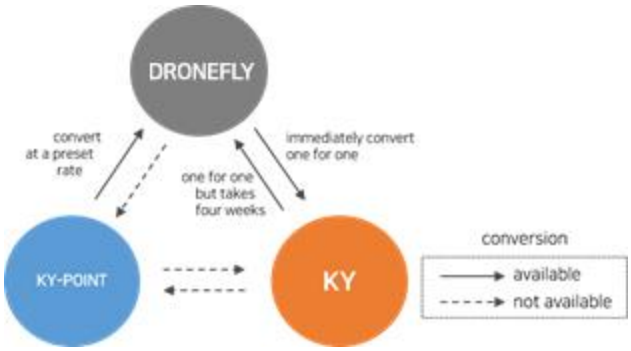


Fig.11 DRONEFLY, KY, KY-POINT Mutuality

Incentive System

All the participants receive KY-POINTs from SIS, SKYWORK Incentive System, when they do activities that bring benefits to DRONEFLY ecosystem. As noted in the token model, people can receive DRONEFLY tokens as a reward, accumulating KY-POINTs. They can use the tokens in many ways within the platform.

Reward

KY-POINTs are given for the following three types of activities.

- Collecting/sharing flight data
- Joining flight data verification
- Being active in DRONEFLY communities

Policy

You can accumulate KY-POINTs every day. The accumulated points, in a weekly policy, will be converted into the designated DRONEFLY tokens. After conversion, all the points are initialized to zero.

When the participants upload their flight data, the data is not directly uploaded to the blockchain network, but has to be verified by the above-the-fixed-level flight experts. The experts will receive KY-POINTs as a reward.

General participants will get a reward for flight data collecting/sharing and community activities, and they're expected to receive more rewards when they join the verification job. Therefore, the DRONEFLY ecosystem will rev up and grow bigger every day.

Token Sale

DRONEFLY issues the tokens on the basis of ERC 2.0, for ensuring smooth operation of the DRONEFLY ecosystem. It will use the proceeds to vitalize global drone industry and its development.

Token allocation

•There is a possibility of potential changes that may affect token allocation or plan of proceeds in proceeding the project.

Roadmap

2021 1Q

2021.01~03

- DRONEFLY whitepaper issued
- dronefly.io website open

2021 2Q

2021.04~06

- FlightTracker development
  (Beta version development completed)
- Wallet development started

2021 3Q

2021.07~09

- FlightTracker development completed
- Market Platform launch
- DRONEFLY blockchain test network started
- Global exchange listing
- Wallet development (Beta version)

2021 4Q+

2021.10~

- DRONEFLY blockchain main network build
- SKYWORK portal website open
- Platform launch
  (Education·Job matching, Sharing)

Team

Partners, advisors, and team members will be notified on DRONEFLY website.

http://www.dronefly.io

Disclaimer

This whitepaper("Whitepaper") is intended to provide general information and is not meant to be exhaustive or comprehensive. This Whitepaper may be amended from time to time without notice. The updated Whitepaper will be found on the DRONEFLY website. KYON Inc. or its related corporations and/or corporate affiliates accepts no liability in relation to the Whitepaper, or any reliance on the Whitepaper, and does not warranty the accuracy or completeness of the Whitepaper.

The risks listed below, and or other additional or potential risks, the commercial execution may be materially or adversely affected, and could result in the suspension of the DRONEFLY tokens or and/or the termination of the operation of DRONEFLY.

- The development of DRONEFLY platforms or services, and other products of DRONEFLY or its related corporations and/or corporate affiliates may fail, be abandoned or be delayed for various reasons, including lack of funding, lack of commercial success, or lack of use by participants.
- The functions of DRONEFLY token will require enhancements, and their development is ongoing, and full functions of DRONEFLY token may take longer than announced. No assurance of DRONEFLY token can be provided of the completion.
- The form and functionality of the business platforms of DRONEFLY ecosystem, which are announced by the Whitepaper or the DRONEFLY website, may not be met upon actual release of the DRONEFLY and/or the DRONEFLY tokens, for a number of reasons including changes in the design or execution, or delays.
- The value of DRONEFLY token may drop or rise according to volatility of the cryptocurrency market, but no assurance for the rise in value of DRONEFLY tokens of its related corporations and/or corporate affiliates is provided.
- Apart from the growth of drone industry, drone aircrafts may be regulated by government authorities and other regulatory bodies, and DRONEFLY or its related corporations and/or corporate affiliates could be adversely affected, and no responsibility or any guarantee for settling the regulatory actions will be granted by KYON Inc. or its related corporations and/or corporate affiliates.
- Cryptocurrencies are subject to regulatory investigation by government authorities and other regulatory bodies around the world, and DRONEFLY or its related corporations and/or corporate affiliates might be adversely affected by the regulations accordingly.
- Technical advances in code cracking or in the development of quantum computers may result in potential risks to cryptocurrencies and DRONEFLY, which may lead to KYON Inc. or its related corporations and/or corporate affiliates.

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