

Research on legal improvement measurements on drone use

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Abstract

The main subject of year 2016 Davos forum was “The 4th Industrial Revolution.” Recently, interests and investment in drone market, so called industrial revolution in the sky is growing in many countries around the world. Before, drone was used for military purpose such as reconnaissance or attacking but today, it is used in various private sectors such as unmanned delivery service, agriculture, leisure activities, etc. Presently, many major countries in the world are already involved in the ‘war without gunfire’ to be dominant in this drone industry.

Korean government also has announced an extreme relaxation of regulations for growing drone industry by opening a conference with Ministers related to economics. During the conference, business scope of drone which was limited to agriculture, photographing, and observation was expanded to all the fields except for cases hindering national safety and security. In terms of shooting purpose drone its process of receiving approval for flight and shooting is simplified to online registration. What is more, drone delivery service will be allowed in island areas such as Goheung, Yeongwol, etc from first term of year 2017. Finding the way to apply drone in criminal investigation is also speeding up. Recently, Public Safety Policy Research Center in Korean National Police University has inquired for research service and its result will be out around November.

Likewise, although more and stronger foundation for supporting drone industry is made but there are still, some opinions saying that we should take a careful approach in consideration to the side effect such as abuse in crime. One may also try terror by placing a dangerous substance. If drone falls, it may hurt any civilians. Moreover, if shopping purpose drone is hacked, it may result in violation of privacy.

Compared to America, Europe, and China, we are at the very beginning stage of drone industry and it is necessary to reorganize legal issues to grow this industry. This can be thought from two perspectives; first, the growth of drone industry is blocked by difficult regulations on Aviation Law and Radio Regulation Law. The second issue is the safety and privacy that are required for operating drone. For the advanced technologies to make human life more profitable, more active and proactive actions are required by criminal law side. In preparation to the second mechanical era where man and machines should go together, I hope that responsible preparation is required in all fields including the criminal law.

▶ Keyword : Drone use, The 4th Industrial Revolution, Privacy violation, Legal solution on drone

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I . Introduction

The main subject of year 2016 Davos forum was “The 4th Industrial Revolution.” Recently, interests and investment in drone market, so called industrial revolution in the sky is growing in many countries around the world. Before, drone was used for military purpose such as reconnaissance or attacking but today, it is used in various private sectors such as unmanned delivery service, agriculture, leisure activities, etc. Presently, many major countries in the world are already involved in the ‘war without gunfire’ to be dominant in this drone industry.

In America, it is ready to allow commercial drone delivery service where goods are delivered to each house by drone. The big companies including Amazon and Google are planning to establish drone delivery system for its online purchases by year 2017. China is also expanding its market in this field based on its strong technologies. Currently, about 70% of private drone market in the world is occupied by DJI, a drone manufacturing company in China. Each country is speeding up establishment of law related to this. In the conference organized by NASA, Amazon suggested to designate altitude of 61m to 122m above the ground as drone freeway. The Prime Minister of Japan Shinzo Abe announced the goal of ‘commercializing drone delivery service in 3 years’ last year.

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approach in consideration to the side effect such as abuse in crime. One may also try terror by placing a dangerous substance. If drone falls, it may hurt any civilians. Moreover, if shopping purpose drone is hacked, it may result in violation of privacy.

Compared to America, Europe, and China, we are at the very beginning stage of drone industry and it is necessary to reorganize legal issues to grow this industry. This can be thought from two perspectives; first, the growth of drone industry is blocked by difficult regulations on Aviation Law and Radio Regulation Law. The second issue is the safety and privacy that are required for operating drone.

II . General Regulation on Drone

1. Legal Regulations

1.1 Aviation Law

In accordance to Aviation Law, if the weight of aircraft except fuel is lower than 150kg it is categorized as ‘unmanned flight device’ and one exceeding 150kg is categorized as ‘unmanned aerial vehicle.’ Again, this unmanned flight device is divided into for commercial purpose or non-commercial purpose depending on its weight, whether it exceeds 12kg or not.

It is not possible to fly drone in all places. According to the current Aviation Law, there are certain areas where drone cannot be flown including within 9.3km from the airport, altitude over 150m, and in places with many people. Also, it is banned to fly drone after the sunset regardless of its weight and flight purpose. Flight in those banned areas require approval of Minister of National Defence. Although areas allowed for flying drone is widely limited but fine they pay for violating this law is only maximum 2 million Korean Won. [1]

Although it is used for the public purpose, flying drone high in mountain, sea, and road is considered illegal. Looking from this point, there is a high possibility that drone developers for industries and research as well as people using this for civil purpose might become the potential law breakers. Therefore, this will become a big issue in the future.

Until now, drone under 12kg is not subject to the filing but with the event of unmanned flight taking pictures of the Korean Blue House, changing law to report those

drones under 12kg as well is in the process. Recently, Ministry of Land, Infrastructure, and Transportation announced that it is considering to increase fine for illegal drone flight as well as giving penalty points. It is keep promoting such regulations by specifying pilot regulations to reduce cases caused by not enough information on them. [2]

According to the revised Aviation Law in 2013, to use over 12kg drone for commercial use, pilot should have 'super light flight device pilot certificate' issued by the nation. One of the reasons for having crash accidents of unmanned flight for killing insects is also because of this reason. If uncertified person spray insecticide the person should pay 3 million Korean Won fine. Last year, total 897 people received pilot certificate and so far total 1600 people have the certificate. Based on the statistics, total 968 over 12kg drones were registered. [3]

1.2 Radio Regulation Law

Those drones used by public organization or private sectors use 2.4GHz or 5.8GHz frequencies. The standard power output by present law is 2.4GHz is 300mW and 5.8GHz is 10mW. The maximum distance for receiving 300mW output for drone is 300m.

In terms of picture receiver more conventional way is used and the maximum output is only 10mW with receiving distance of 30m. If output exceeds 10mW one should pay penalty. What is more, drone is categorized as 'low power wireless machine and it is not subject to approval by Central Radio Management Service. This means that even if one wishes to increase the power output prior approval is not required.

For those drones used in mountain and sea areas for saving people it shall operate at least 1000m distance away. For the safe flight and smooth signal receiving, at least over 1kW of radio output is required.

2. Related Government Departments

Another thing often pointed out is that related departments are too separated. In consideration to enacting law, Ministry of Land, Infrastructure, and Transportation says it will rule by Aviation Law but Ministry of Trade, Industry, and Energy and Ministry of Science, ICT, and Future Planning are growing this business under Robot Industry Law.

The department for approving this shall be unified as well. Currently, approval for drone flight is done by

Capital Defense Command, Ministry of National Defense, and Ministry of Land, Infrastructure, and Transportation, making it too complicated. For limited areas in Seoul, flight approval is controlled by Capital Defense Command and those areas out of Seoul are controlled by Ministry of National Defense. For regular areas, approval from Ministry of Land, Infrastructure, and Transportation is required. Therefore, it is necessary to re-organize this process. [4]

3. Setting Regulation Free Zone

As voices saying that present regulation limiting use of drone for commercial purpose due to security problem to spraying insecticide and aerial shooting is blocking growing of drone industry have come up, Korean government has set some model areas as free drone flight; Jungdong Jangsapo Busan, Dalseonguk Gujimyoon Daegu, Youngwol Deokpori Gangwon, Goheung Gosori Jeonnam, etc.

For unmanned flight devices under 150kg, according to the Aviation Law, they are only allowed for operation within 150m altitude in day time. However, in those model area, one can fly drone at night in altitude out of vision. In those areas, Korean government also has selected 15 exemplary companies including Korea Airlines, KT, CJ Korea Express, and National Institute of Forest Science. Those companies chosen will have pilot tests such as delivery service, emergency aid delivery, and examining geographic features.

Nevertheless, in some areas, it is necessary to provide uniform guidance on using drone for commercial use in areas other than Regulation Free Zone. Recently, Hotel Shilla, which was building one of the largest duty free center at Yongsan I-Park Mall, Seoul submitted an application form to Ministry of National Defense inquiring 5-hour aerial shooting of areas around I-Park Mall. The purpose was to shoot 277,200m² of I-PARK MALL area from the sky and use this video clip for business presentation. However, Ministry of National Defense has first rejected this application because nearby Yongsan areas are military establishments on reservation. Later they determined that it will not cause any security problems and finally approved this application. As this is the case, it is necessary to have a uniform regulations on drone for the industry development and stability of business people.

III. Legal Solution on Drone

1. Examples of America

In 'advanced drone country' America, the number of cases where one's right to fly drone and privacy colliding is increasing. This is nothing different from those drones used for hobby which have remove control and high resolution shooting functions. As lawsuit related to this are growing, many legal issues are arising such as how high in the sky is defined as the control of the land owner, what are the conditions of self-defense when drone flying over the private territory is destroyed, etc.

To prevent privacy violation related to this, America has enacted Droneaircraft privacy and transparency act of 2013. This applies to both army and private drones.

2. Examples of Europe

In June 16th 2015, EU data protection tea, has established 『Guidelines on privacy and information protection when using drone』. The details of this as follows. [5]

2.1 Regulations before operating drone

- Shall check whether local law allows drone flying and no any special approval is needed from CAAs or not.

- Clarify the role of other participants: Unless personal information processing is directly done by the controller, the processor shall follow contract or regulations belonging to the controller and the person should follow instructions from the controller.

- Evaluate influence on personal information in consideration to purpose and type of drone flight and feature of sensor technologies built in the drone.

- Select the most proportionate technology and apply all the appropriate tools for privacy by default.

- Find the most appropriate way to send advance notification to those people whose personal information may be affected.

- Prepare appropriate technical and control measures to ensure one's protection from the risks that may rise from processing personal information.

- For those unnecessary personal information, delete immediately or anonymise after the collection as soon as possible.

2.2 Recommendations to person in charge of legislation and regulations

- Promote framework for respecting all the basic right including aviation safety across all the EU member countries.

- Harmony and modernization of regulations on drone across the member countries (including legal issues on flying drone across the boarder).

- As a part of above framework, adoption of special law for ensuring responsible drone use (must include respect to private territories): may establish areas ban for drone flying.

- Make it obligatory for EU members to inform possibilities of potential violation of drone technologies when selling small drones and necessity of respecting law and regulations in EU member countries in terms of privacy protection.

- From EU or member countries, develop and adopt evaluation standards for checking influence on personal information which can easily be used by industry and user.

- Adopt domestic regulations used for controlling commercial use of drone from the perspective of protecting personal information (ex. relating right to flying drone and training, airworthiness approval standard, issuing and cancellation of flying license, etc).

- Not only from the monitoring side of private drone users respecting regulations on personal information but also promote personal information approval to enhance recognition on issues related to personal information protection.

- Recommendation on running fund supporting program for assisting research and investment of new technologies for promoting transparency of EU executive committee (technologies related to notifying drone operation and its purpose to the public and access).

2.3 Recommendations to drone manufacturers and operators

- Add privacy-friendly design and default setting as part of 'privacy by design.'

- Include data protection officer from the design and policy implementation related to drone use.

- Promotion and adoption of strong law which can help prevent violation of various drone users and intensifying social acceptance of drone (including counteract in case of going against the law).

- Drone shall be designed in most noticeable and identifiable form.
- Try to avoid flying drone over or nearby private properties and buildings when planning or operating.

2.4 Recommendations on collected personal information by drone used to law enforcement

- Should follow principles of necessity, proportional, justification of the law, data minimization, and privacy by design.
- Abide by transparency: for personal information processing by the use of drone, it shall base on the law o that subject of information can predict and processing as well as related rights shall be notified to the subject of information.
- It is banned for legal institutions to keep track the person when processing the personal information but still, it is thought to be necessary, it shall be limited to investigations under arrest warrant.
- Prohibition of automated enforcement of decisions shall apply to drone use and personal information processed by drone shall be reviewed by the flyer in more details before it may have a bad influence on the person.
- The Court shall examine use of drone for the purpose of intelligence and law enforcement in accordance to practices.
- Shall implement regular investigation on necessity of personal information processing and law respecting related to drone use
- For the use of drone for law enforcement, it shall have the approval from the upper organization.

3. Examples of Korea

If no individual law related to drone is enacted in Korea, it would be the optimal way to deal with it from civil law and privacy act. Or, another method could be to create a law on privacy protection in current Aviation Law.

3.1 Civil law

In research paper on application of Civil Law released by Changho Ryu, it says "in Korea, the ownership of land owner is acknowledged even for power cable built over 100m from the land. Based on this practices of having divided superficies, it seems possible to insist right of land owners of drone flying over one's private land as it

is allowed to fly under altitude of 500ft (about 153m)." It implies that there could be issues related to compensation for the damage from claim for removal of disturbance, ban on life disturbance, and illegal actions.

When drone crosses one's private land or stays over it, moment of violation is not acknowledged and thus, it is not appropriate to claim for removal of disturbance. However, in case of repeated flying, it is of course, right to claim for prevention for the future. On top of this, if it applies to ban on life disturbance by Article 217, one can claim for appropriate prevention measure. What is more, if photo or video shooting is made or watching through streaming is made, it will apply to illegal behavior in accordance to ban on life disturbance and privacy violation. Responsibilities on illegal behavior can also be determined independently. Similar to other cases, extent of unbearable annoyance of land owner or residence shall be recognized and their claim should be considered for the extent exceeding the limit of unbearable annoyance.[6]

3.2 Privacy Act

In one side, related to privacy, there is a law related to limit to installation and operation of video information processor in 「Privacy Act」. This could be a way to deal with privacy violation issues caused by unmanned aircraft. Especially in accordance to Article 25, Clause 2, it says that "it is not allowed to install or operate video information processor to see the inside where it is obvious to violate personal privacy."

However, 「Privacy Act, Enforcement Ordinance」 only regulates video information processor as CCTV or network camera ("device which allows processing of information including collecting and storing anywhere through wire and wireless internet taken by it continuously in a certain area by the installer and controller). This mens that network camera is supposed to be installed in a certain area continuously. Such law is made in consideration to CCTV only. It seems impossible to include unmanned aircraft which is mobile. For unmanned aircraft which can transfer visual information to the central control tower through camera and sensor, it is included in visual information processor by its definition and thus, such details shall be included in the details of Privacy Act Enforcement Ordinance.

3.3 Criminal law

As basic conditions and process related to criminal investigation are already regulated by Criminal Law, criminal investigation using drone shall be regulated organically. For example, it does not matter regulating drone used in civil sector by aviation law but for drone used for criminal investigation, it is more appropriate to regulate by criminal procedure. What is more, base regulation for regulating violated rights by legal organizations, processing of information collected by drone, and checking owning and operation status of drone by legal organizations. Some can be regulated by present law such as Privacy Act but in consideration to drone's speciality, individual law for regulating its use can be created. However, even though special law for regulating drone is created, condition and process of using such regulations shall be defined by Criminal Law. [7]

(a) Warrant: For investigation agencies to use the drone, they shall have advance warrant from the Court or legal organizations. Also, subject of investigation, range, and approval period shall be defined in the warrant.

(b) Limit to evidence for illegality: As current criminal law indicates that evidence collected in an appropriate process is only admitted (Article 308 Clause 2) no other regulations for rejecting evidence collected by drone used illegally by investigation agencies are required.

(c) Privacy protection, etc: When legal organizations use the drone, it shall have warrant from the Court in principle and the Court shall approve its use in certain areas only. Also, for police to collect evidence using drone in demonstration or rally, necessity of evidence protection for illegal actions of participants and its emergency shall be admitted. When video shooting in a wide range, it is almost impossible to shoot a certain area or person. Also, it is difficult to have general measures related to privacy protection. Therefore, there should be principles for protecting privacy in managing and controlling collected information afterwards.

First of all, to prevent limitless information collection and storage, one should clarify details on subject of collection and period of storage. Also, there should also be regulations on ways to process collected information, building of report system for checking number of devices and their use owned by legal organizations, and information opening. However, there should be exceptional regulations for storing information when

investigation on serious crime is in process or evidence should be submitted during criminal lawsuit.

(d) Remedy for violated rights: When drone is used by legal organizations for patrolling or criminal investigation, not only the suspects but privacy of nation can be violated. In accordance to the present law, any nation whose rights are violated by national organizations can claim for damage compensation in accordance to Constitution Article 29 and National Compensation Law. Likewise, if any damage is brought about from use of drone by legal organizations, there are law where people can claim for compensation. Therefore, the necessity for making additional regulations as remedy for violated rights is relatively smaller.

IV. Prospect and Proposal

Drone is involved in our daily life and used widely in various fields. Korean government is developing and implementing various institutions for growing drone industry and also public fields are recommending its use. [8]

In March 2016, artificial intelligence AlphaGo developed by Google DeepMind beat Sedol Lee in Go competition and Korean society was shocked by this. As the 4th industrial revolution led by robot technology and life engineer including artificial intelligence has come closer, people are expecting that such state-of-the-art technologies will make our life more convenient and safer. On the other hand, there are also worries saying that man's own willingness be ignored and dystopia future will come with close surveillance. Along with increase in awareness of human right of our nation, privacy violation is raised whenever new technologies are adopted in criminal justice system. It will be a homework for criminal justice system to evaluate feasibility of the law and finding the balance between the law and privacy by analyzing those new technologies and purpose of use. For the advanced technologies to make human life more profitable, more active and proactive actions are required by criminal law side. In preparation to the second mechanical era where man and machines should go together, I hope that responsible preparation is required in all fields including the criminal law.

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