

Unravelling the Future Game of Drones

Can they be legitimized?

April 2018

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1. Overview

*“Everything that can be invented has been invented.”*¹

This statement may have appealed to the United States’ Patent Office in 1899; however, technological advancements presented by the 20th and 21st centuries have proven them wrong. The materializing of self-driven cars, cloud computing and introduction of concepts such as Machine to Machine (M2M), Internet of Things (IOT), augmented reality etc. have proven that innovation is not bound by any limits and has no goals to rest. Driven by the human imagination, innovation has touched our lives in an unprecedented manner.

On one hand the Internet has largely broken the barriers of physical borders and brought people closer, on the other, several ground-breaking inventions have provided a plethora of benefits to human kind. One such revolution in the making is the increasing use of drones. Ever since their introduction, drones have opened up several commercial applications in different fields ranging from delivery of products to end-consumers, capturing aerial footage for news purposes by journalists, entertainment, transport etc. Governments

and militaries across the world have also been employing drones for guarding their international borders and other law enforcement purposes.² The global Unmanned Ariel Vehicles/ drones market is expected to reach USD 5.59 Billion by 2020, at an estimated Compound Annual Growth Rate (“CAGR”) of 32.22% between 2015 and 2020.³

Despite several advantages, there is a high possibility of misuse of drones. A lot of concerns relating to the chilling effects caused to privacy and security rights due to unauthorized surveillance, tracking & profiling using such data collected, have been raised across jurisdictions by different stakeholders.

The given paper provides a brief introduction to the concept of drones, the technology they can integrate with and their current commercial capabilities and uses. It further analyses the legal and tax issues on drones usage along with providing a comparative regulatory frameworks of different jurisdictions. The concluding section provides for a way forward to ensure successful regulations which will strive a balance between drone usage and policy making.

1. <http://patentlyo.com/patent/2011/01/tracing-the-quote-everything-that-can-be-invented-has-been-invented.html>

2. <http://www.ndtv.com/india-news/india-seeks-to-purchase-patrol-drones-from-us-1421891?pfrom=home-topstories>

3. <http://www.marketsandmarkets.com/PressReleases/commercial-drones.asp>

2. What are Drones?

Drones, as we know them today, represents a significant development in robotic technology⁴ and the private use of drones has started trending in media recently. The use of unmanned aircraft such as drones, is not a new concept and the origins of the concept can be traced back to 1896, when the first pilotless steam-powered aircraft registered a powered flight lasting over one minute.⁵ Drones come in many shapes and sizes and can be operated by individuals for recreational or commercial purposes. Unlike traditional helicopters and hot air balloons, drones have the capability of flying at lower altitudes combined with data capturing capabilities of smart computing devices. They also differ from the traditional aircrafts, as they are mostly economical to operate and easily accessible to a wider range of population.⁶

In common terminology, drones refer to aerial vehicles, which can fly without a human operator. For regulatory purposes, different countries and international organizations have provided varied definitions. Some of these definitions have been reproduced below.

In general aviation and space-related parlance, a 'Drone' refers to *any vehicle that can operate on multiple surfaces and/or in the air without a human being on board to control it*. They vary in size, shape, form, speed, and a host of other attributes, though some jurisdictions categorise and regulate them by weight. A drone could vary from a model aircraft / toy in a store or a large sized aircraft sent in a war zone.⁷

Other terminologies describe drones as **Unmanned Aerial Vehicles ('UAVs'), Unmanned Aerial Systems/ Unmanned Aircraft Systems ('UAS'), Model Aircrafts.**

I. Unmanned Aerial Vehicles ('UAVs')

A UAV refers to a power driven aircraft that is designed to fly without a human operator on board. The International Civil Aviation Organization (the "ICAO"), charged with codification and regulation of airways, identifies drones as UAVs. It has also coined an exclusive term defining them as Remote Piloted Aircraft Systems (the "RPAS"). The ICAO Circular on Unmanned Aircraft Systems, 2011 defines an RPAS as *'[a] set of configurable elements consisting of a remotely-piloted aircraft, its associated remote pilot station(s), the required command and control links and any other system elements as may be required, at any point during flight operation.'*⁸

The use of the term "Remote Pilot" is of key importance here as it highlights the fact that the system is not always unmanned and always has a pilot in command responsible for the flight,⁹ which may also be controlled either by on-board computers or a remote control of a pilot on the ground. Thus, RPAS belong to the wider family of Unmanned Aircraft Systems. The ICAO has also constituted an RPAS Panel, which aims to deliver standards for unmanned aircraft to ICAO's Governing Council ('GC') by the end of 2018.¹⁰

4. http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2571490
 5. http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2385448
 6. http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2571490
 7. https://www.priv.gc.ca/information/research-recherche/2013/drones_201303_e.asp#ftnref5

8. ICAO Circular 328-AN/190.
 9. Council of the European Union. Towards a European Strategy for the development of civil applications of Remotely Piloted Aircraft Systems external (RPAS), Working Paper (13438/12), September 6, 2012. Council of the European Union.
 10. <http://www.ainonline.com/aviation-news/aerospace/2015-01-06/icao-panel-will-recommend-first-uav-standards-2018>

II. Unmanned Aerial Systems ('UAS')

The term 'UAS', though defined similarly, is broader in its ambit and includes:

- the aircraft;
- the control system(s) on the ground;
- the control data link(s);
- other support equipment;

III. Model Aircrafts

Model Aircrafts' are defined as aircrafts, which are mechanically driven or launched into flight for recreational purposes and are not designed to carry persons or living creatures. According to FAA Modernization and Reform Act, 2010, a drone may be equated with a "model aircraft" if it weighs less than 55 pounds and is operated in compliance with certain safety guidelines such as flying within the operator's line-of-sight, below 400 feet, and providing prior notice to air traffic control operators if flying within a 5 mile radius of an airport.¹¹ Since model aircrafts are generally recognized as being intended only for recreational purposes, they are not covered under the ambit of any international regulations, and are exclusively governed by relevant national regulations, if any.

While these definitions focus on the technology and functioning of drones, the military journals provide for different definitions based on their usage. For e.g. The US Department of Defence Dictionary of Military and Associated Terms defines UAVs as:

"A powered, aerial vehicle that does not carry a human operator, uses aerodynamic forces to provide vehicle lift, can fly autonomously or be piloted remotely, can be expendable or recoverable, and can carry a lethal or non-lethal payload. Ballistic or semi-ballistic vehicles, cruise missiles and artillery projectiles are not considered unmanned aerial vehicles."¹²

Hence, based on the above definitions, we can broadly consider drones to be unmanned aircrafts/ ships guided by remote controls used for different purposes. The fact that they may be operated without a person on board, allows them to be designed smaller, making them less obstructive from the conventional aircrafts.¹³

Also, the possibility of embedding several other technology devices such as Global Positioning System ("GPS"), camera, computer systems, sprayers, etc. with drones has opened up many avenues for their uses in commercial and domestic spheres. As per a study by the Association for Unmanned Vehicles Systems International (AUVSI), drone industry in the United States of America could provide up to over 100,000 new jobs and add \$82 billion in the economic activity between 2015 and 2025.¹⁴ Drones, therefore, are a form of technical innovation that has tapped the doors to an entirely new market, bursting with potential.

The usage of drones from legal, operational and security perspective has been discussed in further sections.

11. https://www.faa.gov/uas/publications/model_aircraft_operators/

12. http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2385448

13. http://www.academia.edu/11845032/Privacy_law_implications_of_the_use_of_drones_for_security_and_justice_purposes

14. <http://www.auvsi.org/auvsiresources/economicreport>

3. The Cutting Edge Applications of Drones Today

Drones have multitude uses which have become apparent. They could be used for the quick delivery of donated organs, thereby avoiding the expense of hiring air transport or having to deal with traffic thereby potentially saving more lives.¹⁵ They can be used for enhancing agricultural efficiency by identifying factors such as moisture content and nutrient soil availability. Remote sensing through drones can be of significant use in disaster-prone areas like pinpointing and fighting fires¹⁶ or detection of theft and pilferage of goods meant for public utilization, or in detection of LPG gas leaks which can save several lives and resources.¹⁷

Drones also find application in law and enforcement, helping with border patrolling, although cost concerns have been raised regarding a flagship effort on the US-Mexico border.¹⁸ However with improving technology such concerns can be overcome, and undeniable advantages such as being undetectable will help in preventing human and drug trafficking, spotting and reacting to border infractions and assistance in monitoring otherwise inaccessible terrain. One of the developments which has caught the imagination of the public has been drone delivery in e-commerce which was spearheaded by Amazon's announcement two years ago. This has however, run into problems with Federal Aviation Authority (FAA) regulations as discussed later.

The latest developments in the field include concepts such as 'drone racing' which has garnered worldwide attention¹⁹ and a 'drone taxi', where the passenger, would only set a flight plan and instruct the device to take off or land via a tablet, with no further controls. There would be a back-up control centre which may take over in an emergency.²⁰ This drone, besides being a variation on the 'flying car' theme is also characterized by its autonomy. The key issue here is the degree of autonomy that is granted to the non-human components. Many drones already have autonomous functionality, to the extent that they avoid collisions and some to the extent that there are only provided general instructions or waypoints to follow, with the rest being left up to the drone.²¹

While regulations have generally not addressed this aspect, the circular released with the latest FAA regulations in June 2016, has allowed autonomous operation, but within certain limits.²² However, it does not provide for regulation over larger drones as in the case of a drone taxi or it having only non-pilot human passengers. While it remains in a legal grey area, this field is likely to evolve along the lines of self-driven cars.

15. <http://www.deccanherald.com/content/501388/drones-may-soon-used-organ.html>

16. <http://www.businessinsider.in/The-fire-in-Alberta-doubled-in-size-on-Saturday-and-firefighters-are-using-drones-to-fight-it/articleshow/52170421.cms>

17. <http://www.businessinsider.in/Now-a-drone-that-detects-LPG-gas-leak-and-delivers-emergency-medical-kits/articleshow/48467531.cms>

18. <http://www.foxnews.com/us/2015/01/13/federal-report-says-border-patrol-drone-program-doesnt-fly.html>

19. <http://www.techinsider.io/drone-racing-league-could-go-mainstream-pilot-says-2016-2>

20. <https://www.theguardian.com/technology/2016/jan/07/first-passenger-drone-makes-world-debut>

21. <http://www.directionsmag.com/entry/future-trends-newest-drone-tech-revealed-at-ces-2016/462157>

22. https://www.faa.gov/uas/media/AC_107-2_AFS-1_Signed.pdf

4. Security and Privacy Concerns with the use of Drones

The absence of adequate safeguards and regulations with respect to the use of drones has raised several concerns. These relate to issues such as government overreach, data aggregation and invasion of privacy in public. It is imperative that these concerns are acknowledged and addressed efficiently by adequate regulations.

I. Unauthorized surveillance

It is well known that drones can be easily utilized for mass surveillance. This is to be understood in context of digital technologies that aim to revolutionize our daily lives, by having more detailed records about those lives.²³ In the name of national security and terrorism, surveillance mechanisms are utilized to track and profile the citizens by the state as well and private agencies. By the virtue of their design and size, drones can operate undetected, allowing the user to monitor people without their knowledge. For instance, there are drones with super high-resolution gigapixel cameras that can be used to track people and vehicles from altitudes as high as 20,000 feet.²⁴ They can carry equipment such as fake towers, which can break Wi-Fi codes and intercept text messages & cell phone conversations without the knowledge of either the communication provider or the user.²⁵ Drones equipped with advanced technologies can penetrate test networks and collect unencrypted data and even establish fake access points. Such unwarranted surveillance casts chilling effects

on the citizen's civil liberties, intellectual privacy eclipse people's right to dissent. Moreover, information collected surreptitiously can be used to blackmail or discredit opponents.²⁶

Surveillance is not restricted to the state; in fact the private companies also generate vast fortunes from the collection, use and sale of personal data. Although it may be argued that the collection of data about a person does not violate her/ his privacy interests *per se*, extensive collection can rise to a level of privacy intrusion.²⁷

II. Data Aggregation

Data mining/ aggregation refers to the technique of matching different data sets to draw inferences to learn new things and make predictions about the data subjects.²⁸ Apart from monitoring, drones amass large amounts of personal data, which can be very crucial to an individual's privacy. Post collection, the aggregation of drone-collected data with other personal information such as bank account details, telephone number, biometrics, etc. obtained from other resources can entail a unique privacy infringement beyond the mere collection of those individual data sets.

The mass collection of this data, which otherwise has been unobservable and its integration with other databases leads to 'Big Data',²⁹ which may raise several potential problems regarding privacy rights and consumer power.

23. <http://harvardlawreview.org/2013/05/the-dangers-of-surveillance/>

24. <https://www.eff.org/deeplinks/2012/01/drones-are-watching-you>

25. <https://www.eff.org/issues/surveillance-drones>

26. The Intellectual privacy theory suggests that a meaningful guarantee of privacy, protection from surveillance or interference is necessary to promote intellectual freedom.

27. <https://fas.org/sgp/crs/misc/R43965.pdf>

28. <http://www.dbta.com/Editorial/Trends-and-Applications/What-is-Data-Analysis-and-Data-Mining-73503.aspx>

29. Big Data refers to any voluminous amount of structured, semi-structured and unstructured information that has the potential to be mined for information.

III. Hacking

The drones used by the government for maintaining law and order and for patrolling the borders, generally contain sensitive information. However, like every computer resource, drones are also prone to getting compromised. There have been previous instances where even the high-equipped patrolling drones have been compromised. A report provided by the University of Texas observed that the current generation of the UAVs is vulnerable to spoofing, hacking and jamming. In another instance, drug traffickers across the Mexican border successfully hacked the US Department of Homeland Security (DHS) and the US Customs and Border Protection (CBP)'s UAVs by sending wrong GPS coordinates, making it possible for them to avoid surveillance and cross the border.³⁰ A more alarming instance is that of drones being hacked by terrorists, gaining access to live feeds.³¹

Apart from being compromised, drones can be used to hack other devices as well. Recently, a group of researchers at Singapore University of Technology developed a drone which hacked the printers while flying outside the building and sharing the sensitive information directly with the drone.³²

Hence, there is a need to ensure that adequate measures are taken to maintain high encryption standards for the data stored on the drones and strict punishments and penalties are prescribed for unauthorized hacking of drones.

IV. Potential Security Hazards

The opening up of respective national skies for the private and domestic use of UAVs, also gives rise to the risks of possible accidents caused by collisions, battery failures, loss of navigational control or other equipment's etc. The operation of UAVs is significantly different from that of the conventional aircrafts. The traditional air traffic control system issues a command for the pilot by radio and the pilot thereby avoids the collision. However, the current generation of drones / UAVs are not technically advanced to avoid such collisions and the users may not be properly trained to ensure that the risks of the accidents are mitigated. There is also a lack of clarity of segregation of no-fly zones and enforcement of such segregation. Numerous accidents were reported in the last three years because of negligent use of drones. For e.g. In July, 2014, a drone narrowly avoided a coalition with an Airbus A320 at the London's Heathrow Airport.³³ Even in USA, more than 600 cases of drones flying near airplanes were reported within a span of 6 months.³⁴

Drones pose a similar risk of injury on grounds caused due to crash impacts. A drone can crash into a populated area due to a system failure or unauthorized third party interference, leaving people on the ground, gravely injured. It is imperative that in order to avoid such hazards, UAVs need to be equipped with ability to detect and avoid other aircrafts while moving through the air. Additionally, the regulatory authority must prescribe minimum quality and technology standards, which must be used for manufacturing of drones meant for commercial or recreational purposes.

30. <https://www.hackread.com/us-border-patrol-drones-hacked-by-drug-cartels/>

31. <http://www.thedailybeast.com/articles/2016/03/25/how-islamic-jihad-hacked-israel-s-drones.html>

32. <http://www.ozy.com/fast-forward/the-next-great-threat-from-hackers-drones/67660>

33. <http://www.techrepublic.com/article/12-drone-disasters-that-show-why-the-faa-hates-drones/>

34. <http://www.techtimes.com/articles/145369/20160329/faa-report-reveals-drones-almost-collide-with-planes-multiple-times-a-day.htm>

5. Drones Regulation

Currently, the domestic use of drones is at a nascent stage. Most countries do not provide for exclusive regulations to govern their operations. Only a few countries such as United States of America, France, and Germany have thoroughly deliberated on various concerns involved with UAVs and have laid down comprehensive legislations to regulate their use. The given section briefly discusses the drone regulation in India and a few other countries.

I. United States of America (“USA”)

A. Federal regulations

The United State of America currently dominates the drones industry, in terms of manufacturing and usage. As per Federal Aviation Administration (FAA)’s report, the number of drones is estimated to cross 7 million by 2020, with recreational drones accounting for 4.3 million units.³⁵ Thus, in order to keep up with the rapid pace of UAVs’ usage, the FAA and the respective states have provided for a plethora of legislations for their regulation.

In 2012, the USA Congress with an aim to address the safety concerns and to provide for uniformity throughout the national airspace, passed the FAA Modernization and Reform Act, 2012. The act requires the FAA to “*develop a comprehensive plan to safely accelerate the integration of civil unmanned aircraft systems into the national airspace system.*”³⁶ It further mandates that a ‘*model aircraft*’ which could be a drone: i) must not weigh more than 55 pounds; ii) must be within the visual line of sight (‘VLoS’) of the operator; iii) must be used only for recreational or hobby purposes.

Model aircrafts are covered by Federal Aviation Regulation (‘FAR’) 101 which came into force in August 29, 2016.³⁷

At present, any federal, state or local agency wanting to operate a drone in national airspace needs a certificate of authorization from the FAA, whereas the commercial use of drones is allowed in compliance with FAA regulations and guidelines for private commercial use and the state-specific guidelines. FAA also plans to create test ranges and designating specific airspace throughout the country to be used to operate drone flights to develop better certification and air traffic standards.³⁸

FAA and the USA Department of Transport also issued an Interim Final Rule of 14 CFR “Aeronautics and Space” Part 48, ***Registration and Marking Requirements for Small Unmanned Aircraft***. The rules require providing for registration of anyone above 13 years of age to register with FAA, for operating drones outdoors for a hobby or recreational purposes, before taking the outdoor flight. Additionally, Rule 91.13 of the Federal Aviation Regulations prohibiting careless and reckless operations of aircrafts is also applicable to drones, as per the case of *FAA v. Pirker*³⁹ where it was observed that drones fall within the definition of ‘aircraft’ for the purposes of this FAR.

In furtherance to this, FAA has asserted a much wider control by using its Interpretation⁴⁰ of the FAA Modernization and Reform Act of 2012 (‘FMRA’), stating that all existing FARs apply to drones as the FAA includes ‘*model aircraft*’ in its definition of ‘Aircrafts, to which the FARs are applicable in law. While the USA Supreme Court has held that the interpretations of a federal agency are not legislative rules, and

35. <http://www.govtech.com/public-safety/Drone-Sales-Could-Reach-7-Million-by-2020-FAA-Says.html>

36. http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2357657

37. http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2357657

38. http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2357657

39. *FAA v. Pirker*, NTSB Docket CP-217, July 18, 2013.

40. Federal Aviation Administration, Interpretation of the Special Rule for Model Aircraft, 14 CFR Part 91, available at: http://www.faa.gov/uas/media/model_aircraft_spec_rule.pdf

do not have the force and effect of law, they continue to stand unless found to be arbitrary.⁴¹

B. Exemptions for commercial purposes

The commercial use of drones is prohibited, however, FAA provides for certain exemptions to fly drones commercially, provided with other compliances such as requirement for operator to obtain a private pilot's license.⁴² The FAA has laid down a procedure under which people can obtain exemptions under S.333 of the FMRA in order to fly their drone commercially.⁴³ This exemption is granted to certain FARs if i) they demonstrably burden the applicant, ii) the applicant adheres to the minimum standard of safety envisaged by the regulations, and iii) it is in the interests of the public.

C. Small Unmanned Aircraft Rule (Part 107)

The FAA has come out with the final version of small Unmanned Aircraft System (sUAS), which came into effect on August 29 2016.⁴⁴ Part 107 regulation provide for detailed operational limits along with the certification process and responsibilities for remote pilots in command.⁴⁵ It allows for operation of drones without applying for a S. 333 exemption. This regulation is significantly different as it does not require operators to pass a medical exam or file any notice to Airmen (NOTAM) prior to commencing a drone operation. It required operators to only obtain a remote pilot certificate by passing an online test regarding the new regulation⁴⁶ and a basic aeronautical

knowledge test rather than acquire any form of pilot's license,⁴⁷ which had been a roadblock.⁴⁸ Furthermore, the new regulation requires person actually flying the drone to be at least 16 years old or be directly supervised by someone holding a remote pilot certificate. It further obligates a drone operator to ensure that the drone is safe prior to flying by performing a pre-flight visual and operational check of small UAS and checking the communication links between the control station and the UAS.⁴⁹

This latest regulation has been hailed as a step forward, but has also been criticized as well since it still does not allow flight beyond visual range of the operator and restricts the flight to daytime.⁵⁰ The continuing restriction on beyond visual range operations rules out implementation of drone deliveries (as they would have to travel kilometres), to the frustration of companies like Amazon and Google, and delivery is specifically left out of the ambit of possible waiver under Part 107.⁵¹ Further in all cases the combined weight cannot exceed 55lbs. However as far as the restrictions in the regulations are respected, commercial applications can be undertaken, with examples of operations benefitting including professional photography, journalism, short distance delivery, farm surveillance, etc.⁵²

The FAA⁵³ grants a Certificate of Waiver or Authorization ('COA'), which can be exercised under the S. 333 exemption as well as new Part 107. The terms of CoA for the purpose of Part 107 will permit activities otherwise proscribed such as, operation from a moving vehicle, beyond visual line of sight operation (however, this explicitly excludes delivery), operations in restricted

41. Perez v Banker

42. Peter Sachs, *Current U.S. Drone Law*, DRONE LAW JOURNAL <http://dronelawjournal.com>.

43. Peter Sachs, *Current U.S. Drone Law*, DRONE LAW JOURNAL <http://dronelawjournal.com>.

44. <http://www.lexology.com/library/detail.aspx?g=a46a14e9-c2c1-40c8-949c-c90e28ecf287>

45. http://www.faa.gov/uas/media/Part_107_Summary.pdf

46. <http://motherboard.vice.com/read/the-faas-new-commercial-drone-regulations-are-a-mess-for-hobby-pilots>

47. <http://waypoint.sensefly.com/u-s-drone-rules-part-107-explained/>

48. <http://dronelife.com/2016/05/17/what-is-part-107/>

49. https://www.faa.gov/news/press_releases/news_story.cfm?newsId=20515

50. <http://dronelife.com/2016/06/21/industry-reaction-part-107/>

51. Peter Sachs, *Commercial drone law*, DRONE LAW JOURNAL <http://dronelawjournal.com/commercial/>

52. http://www.faa.gov/uas/media/RIN_2120-AJ60_Clean_Signed.pdf

53. Peter Sachs, *Current U.S. Drone Law*, DRONE LAW JOURNAL <http://dronelawjournal.com>.

airspace, operating multiple small aircrafts, operations over uninvolved people, etc.⁵⁴

D. State Legislations

As the American Federal Government has exclusive sovereignty over the American airspace, federal enactments pre-empt any state enactment on this issue. Therefore, state governments are blocked out of legislating on this issued due to the passage of the FMRA, which confirms the federal government's intent to continue to "occupy the field" of flight. However, states are at the liberty to provide for ancillary regulations such as providing for security safeguards, segregating no fly zone whereby forty-five states have introduced legislation to protect privacy and limit the use of drones.⁵⁵ Furthermore, certain states like the District of Columbia are a complete no-fly zone for UAVs. The rules set forth after the 9/11 attacks consign the airspace over the area to the category of 'National Defence Airspace', and limit aircraft operations to those with an FAA and Transportation Security Administration authorization.

II. Canada

The Transport Canada is responsible for regulation of all drones used for recreational purpose or for other state uses such as police drones, except for military drones. Private use is regulated by Special Flight Operations Certificate (SFOC) process.

SFOC is a two-step process for drone registration. The first step involved authorization followed by a gradual certification process. The SFOC is issued initially for a specific mission with specific conditions, which restricts the certificate holder to a particular flight plan, to be executed with a specific model of drone. If the operator develops a good track record of successful flights, the authorization is

broadened to include larger geographic area, longer validity periods to cover multiple flights.⁵⁶ As per SFOC process, drones with maximum take-off weight lesser than 2 kg weighing between 2 kg- 25 kgs, do not require SFOC.⁵⁷

III. The European Union

Similar to the United States, the EU also provides for detailed set of regulations for regulating drones operation. The European Aviation Safety Agency (the 'EASA') in December, 2015 released the following notes titled: "*Introduction of Regulatory Framework for the Operation of Unmanned Aircraft*" and "*Proposed Concept of Operations for Drones*", with regard to the regulation pertaining to the use and operation of drones.⁵⁸ These notes provide feedback for EASA members and other stakeholders such as manufacturers and operators of regulatory framework for operation of drones. Based on the nature and purpose, the notes divide drones in the following categories:

- **Open** – These drones do not require an authorisation by an aviation authority for the flight but need to carry out their flight within defined limitations;
- **Specific** – These drones require an operations authorisation by an aviation authority with specific limitations adapted to the operation;
- **Certified** – These are drones with a higher risk associated with them due to the kind of operation they are used for. Such drones require certification from the relevant aviation authorities.

Notably, while the FAA regulations categorise Drones by size and shape, the EASA regulations go for more *risk*-based categories. The EU regulations are focused on licenses and certifications, as noted above. Accordingly,

54. Peter Sachs, Commercial drone law, DRONE LAW JOURNAL <http://dronelawjournal.com/commercial/>

55. http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2357657

56. http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2571490

57. <https://www.tc.gc.ca/eng/civilaviation/opssvs/ac-600-004-2136.html>

58. <https://www.easa.europa.eu/easa-and-you/key-topics/civil-drones-rpas>

permissions have to be sought from the aviation authority and an airworthiness certificate has to be obtained before a pilot is allowed to fly a drone.

With respect to the privacy and data protection ramifications, the EU has released a report⁵⁹ evaluating the implications of drones. As per the report, Europe's existing regulatory framework is adequate to address the concerns posed by the emergent technology. There are certain pre-conditions which need to be addressed to ensure that drones do not pose serious risks for citizens' fundamental rights to privacy and data protection, to security and to safety. In order to address these privacy concerns, the EASA has suggested to install chips/SIM cards in drones and direct operators to self-register in a web based application maintained by the local authorities. Though specific provisions have to be framed by Member States of the EU, the EASA notes provides clarity in terms of the objective of the proposed law and the rights and duties of the stakeholders.

Up until the final EASA rule is published, the EASA has delegated interim rulemaking for the regulation of Drones to its Member States, which have promulgated national regulations for the same. Examples include France's "*Decree of 11 April 2012 on the use of airspace by aircraft operating with nobody aboard*";⁶⁰ UK's CAP 722 "*Unmanned Aircraft System Operations in UK Airspace*";⁶¹ Finland's Regulation TRAFI/4482/03.04.00.00/2015 "*Use of Remotely Piloted Aircraft and Model Aircraft*";⁶² and Germany's "*Common principles of federal and state governments for granting the permission to fly Unmanned Aviation Systems according to § 16 paragraph 1 point 7 Air Traffic Regulations (LuftVG)*".⁶³

59. [http://www.europarl.europa.eu/RegData/etudes/IDAN/2015/519221/IPOL_IDA\(2015\)519221_EN.pdf](http://www.europarl.europa.eu/RegData/etudes/IDAN/2015/519221/IPOL_IDA(2015)519221_EN.pdf)

60. <https://www.legifrance.gouv.fr/affichTexte.do?cidTexte=JORFTEXT000025834986>

61. <http://publicapps.caa.co.uk/modalapplication.aspx?appid=11&mode=detail&id=415>

62. http://www.trafi.fi/filebank/a/1444223591/7ded5988558660d38599203de96117fe/18706-OPS_MI-32_RPAS_eng.pdf

63. German Air Traffic Control, NFL-1-281-13, (December 2013).

IV. Germany

In Germany, the German Aviation Act, 2007 ('*Luftverkehrsgesetz*' or '*LuftVG*'), was amended classifying RPAS as an aircraft for non-commercial purposes, on the fulfilment of certain physical conditions.⁶⁴ Such flights faced certain restrictions under S. 6(4) regarding use in certain zones, and a use-based permissions criterion.

The German Federal Ministry of Transport and Digital Infrastructure⁶⁵ have proposed new rules⁶⁶ for both commercial unmanned systems as well as recreational UAS operations, with relevant prospective legislations to effectuate such changes.

As per the rules, i) all drones weighing over 0.5 kgs, regardless of their use must obtain individual license plates for identification purposes. ii) for commercial purposes, the ministry has the discretion to permit on a case-to-case beyond line of sight flights, pending the determination of safe operation – however, what constitutes 'safe operation' is considerably open-ended. The rules also provide for separate set of regulations for UAVs flights for recreational purposes. According to these rules, recreational flights above 100 meters and out beyond visual line-of-sight are to be forbidden. More no-fly zones have been proposed, namely the airspace over railroads, power plants, industrial facilities and other critical infrastructure such as power transmission networks.

64. Per § 1(2) German Aviation Act; <http://www.gesetze-im-internet.de/luftvg/BJNR006810922.html>

65. http://www.bmvi.de/EN/Home/home_node.html

66. <http://www.bmvi.de/SharedDocs/DE/Artikel/K/151108-drohnen.html>

V. Other Jurisdictions

Other countries which have an expanding presence of drones include Israel, Japan and S. Korea. Israel is one of the leading exporters of military drones in the world, accounting for over 60% of sales, in number of units shipped.⁶⁷

However their domestic regulations require licensing for business purposes and there are distance and height regulations for recreational use as well as area based restrictions.⁶⁸ S. Korea and Japan have recently taken the step of liberalizing their regulations on drones and their usage to encourage a new industry.

67. <http://www.theguardian.com/news/datablog/2015/mar/16/numbers-behind-worldwide-trade-in-drones-uk-israel>

68. <https://uavsystemsinternational.com/drone-laws-by-country/israel-drone-laws/>

6. Drones Regulation in India

Drones are quickly becoming cost effective and more capable and have been widely adopted by the law enforcement agencies in India. Currently, India accounts for the highest percentage of the world's UAV imports (for defence purposes) at 22.5%.⁶⁹ The government of India has recently entered into an arrangement to purchase armed drones from Israel and the US.⁷⁰ With India's innovation flight taking off with the launch of key initiatives such 'Make in India', 'Digital India' and a strong focus on IT start-ups, the government must use this opportunity to make India the world-manufacturing leader for drones.

The technological advancements and the benefits provided by drones have been widely acknowledged by different stakeholders in India, including the government, law enforcement agencies, industry, however, no particular steps have been taken up by the government to provide for an effective regulatory framework of UAVs, particularly for commercial purposes. As witnessed in the past with other technologies as well, the current mandate [*discussed below in detail*] on drones seems to be reactionary and lacks a long-term vision of incorporating drones in achieving goals of socio-economic development. However, the potential of this upcoming sector must not be undermined. As they gain more popularity in the eyes of the public and garner support for a potential market, a timely institution of robust and flexible drone regulations would go a long way towards tapping into and building upon this opportunity. The given section briefly discusses the current drones' regulatory framework in India and the implications of existing laws to the technological advancements.

69. <http://www.timesofisrael.com/india-to-buy-armed-israeli-drones-in-400m-deal/>

70. <http://www.ndtv.com/india-news/india-seeks-to-purchase-patrol-drones-from-us-1421891?from=home-topstories>

I. The Present scenario

Drones have been used in India for an extended period of time, however their use caught public imagination when a pizzeria in Mumbai delivered a pizza, to much fanfare in May, 2014.⁷¹ The police, realising that there were no regulations on drones, banned their use.⁷² This was followed by the Director General of Civil aviation (the 'DGCA') issuing a public notice dated October 7th, 2014, imposing a blanket ban on the use of civil drones in the interest of national security, until further guidelines are issued. It should be noted that while the ban has been imposed due to 'national security', the DGCA acknowledged that drones have potential for a large number of civil applications. Further, in 2016 the Directorate General of Foreign Trade ("DGFT") also restricted the import of drones. Thus, the civilian use and import of drones was banned in India.⁷³ Post this notification, in April, 2016 the DGCA released draft guidelines on possible future drone regulations in India.⁷⁴ However, such draft guidelines never became law and are now replaced by new draft guidelines released in 2017 ('Draft Guidelines'). The civil use and import of drones continues to be banned in India till date.

II. Key features of the Draft Guidelines

A. Applicability

These Draft Guidelines apply strictly to the operations and import of Remotely Piloted Aircraft Systems ('RPAS'), which includes

71. http://www.telegraphindia.com/1140522/jsp/nation/story_18368920.jsp#.V3JATfl97IU

72. <http://www.mumbaimirror.com/mumbai/others/Police-ban-Drones-from-city-skies/articleshow/41661016.cms>

73. [http://dgft.gov.in/Exim/2000/NOT/NOT16/Notification_No.16_\(English\).pdf](http://dgft.gov.in/Exim/2000/NOT/NOT16/Notification_No.16_(English).pdf)

74. [http://www.dgca.nic.in/misc/draft%20circular/AT_Circular%20-%20Civil_UAS\(Draft%20April%202016\).pdf](http://www.dgca.nic.in/misc/draft%20circular/AT_Circular%20-%20Civil_UAS(Draft%20April%202016).pdf)

drones. A RPAS is comprised of an unmanned aircraft controlled by a pilot, not on board but from a remote pilot station ('RPS').

This effectively prohibits flying of all autonomous aircrafts in any form. However, unmanned aircraft such as drones controlled by a pilot from a remotely piloted station can be legally operated in India post the Draft Guidelines becoming law.

B. Category

The categorization of such unmanned aircrafts (and drones) is based on its Maximum Take-off Weight ('MTOW') into –

- i. Nano: Less than or equal to 250 grams.
- ii. Micro: Greater than 250 grams and less than or equal to 2 kg.
- iii. Mini: Greater than 2 kg and less than or equal to 25 kg.
- iv. Small: Greater than 25 kg and less than or equal to 150 kg.
- v. Large: Greater than 150 kg.

Thus, the MTOW of a drone is a key determinant of the regulatory relaxations granted to a drone and the compliances to be observed.

C. Mandatory Issuance of UIN and UAOP

The first mandate for every drone not falling under the exemptions provided in the Draft Guidelines is that the owner must secure a Unique Identification Number ('UIN').

The second mandate obliges operators of all drones, save the categories exempted, to hold an Unmanned Aircraft Operator Permit ('UAOP') to legally operate / launch a drone.

The exemptions for issuance of UIN and UAOP are offered to the below mentioned categories of drones which may be subject to certain conditions as set out in the Draft Guidelines:

i. UNI & UAOP

Nano and Micro drones up to 2kg, without any payload flown below 200ft Above Ground Level ('AGL') inside educational institution premises.

ii. UIN

Nano drones flown up to 50ft AGL.
Drones owned and operated by Government security agencies.

iii. UAOP

Nano drones operating below 50ft AGL in uncontrolled airspace & indoor operations.
Micro drones operating below 200ft AGL in uncontrolled airspace and clear of prohibited, restricted and danger areas and other areas as notified by Airport Authority of India.
Drones owned and operated by Government security agencies.

D. Requirements for issue of UIN and UAOP

i. UIN

To be eligible to apply for UIN, the applicant must either be:

- i. an Indian national; or
- ii. an Indian company/body corporate; or
- iii. a company registered elsewhere than in India that has leased its RPAS to an Indian citizen or Indian company/body corporate; or
- iv. by the Central Government or any State Government or any company or corporation owned or controlled by either of the said Governments.

Amongst other requirements, the applicant must present the application for UIN with documents evidencing:

- i. details of the operator;
- ii. specifications of the RPA,

- iii. purpose and area of RPA operations;
- iv. 'permission for all frequencies used in RPA operations from the Department of Telecommunication ('DoT');
- v. Security Clearance from Ministry of Home Affairs ('MHA');
- vi. Verification of character and antecedents of the remote pilot (s) from local sub divisional police officer.

ii. UAOP

The operator of a drone is required to apply for UAOP at least 7 days prior to conduct of drone activities along with the following documents:

- i. UIN number and related details;
- ii. Copy of clearances from the MHA;
- iii. Permission from ATS provider (civil/defence);
- iv. Permission of land/ property owner of area used for take- off and landing;
- v. Details of remote pilot(s) and training records;
- vi. Insurance details (as applicable);
- vii. Security programmed as approved by BCAS

E. Validity of UAOP

A UAOP once issued will be valid for a period of 5 years and can be renewed on its expiry.

F. Security/Safety Aspect

The owner/operator of drones shall take all security measures to ensure safe control of the drones. In case of any incident / accident involving any drones or if any irreparable damage is caused to a drones, the operator is obligated under the Draft Guidelines to notify DGCA of the same.

The Draft Guidelines also mandates permission of the DGCA to be sought prior to selling or disposing of RPAS (with UIN).

G. Training & Maintenance

To be eligible to fly a drone, a remote pilot is required to have attained 18 years of age and have undergone thorough ground training and practical training, equivalent to the one undertaken by aircrew of a manned aircraft or a private pilot license holder so as to enable him to control the operations of drones under any and all circumstances. However, these requirements will not apply to drones in Nano and Micro category.

Maintenance and repair of drones shall be carried out in accordance with the manufacturer's approved procedures.

The remote pilot shall check the control systems of the drone before each flight and until the drones is in service, the UAOP holder shall maintain records of each flight of a drone and make such records available to the DGCA on demand.

H. Equipment Requirements

The equipment requirements as provided under the Draft Guidelines apply to all drones not belonging to Nano category. The Draft Guidelines set out additional equipment requirements for drones intending to operate at or below 200ft AGL.

III. Recommendations

- The Draft Guidelines place a large number of regulatory responsibilities on the DGCA and other centralised government authorities involved in the procedure of issuance of UIN and UAOP. Considering that the DGCA is already burdened, a separate body / ministry could be established that will enforce regulations so as to not overburden the DGCA /MHA.
- From a compliance perspective, the Draft Guidelines do not differentiate between drones used for educational / recreational purposes and commercial use. In most drone regulated countries, the level of compliances

depend on the purpose for which drones are used. The same may also be considered for India.

- Also, there is some overlap / ambiguity on what drones are exempted from obtaining a UIN and UAOP. It would be helpful if the same is clearly enlisted.
- The Draft Guidelines have levied a bar on (i) foreign citizens; and (ii) Indian companies owned by foreign companies, from owning drones. This restriction will discourage foreign players to be associated with the Indian drone industry.
- The Draft Guidelines mandate security clearances from the MHA and verification of character and antecedents of the remote pilot from local sub-divisional police officer. The verification of character and antecedents could be justifiable, however security clearances from the MHA would result in the approval process becoming time consuming and bureaucratic.
- The terms ‘owner’ and ‘operator’ in the Draft Guidelines have been used interchangeably creating ambiguity on certain compliances in relation to the ownership / operation of drones. It would be helpful if the same is clearly identified.
- The process for obtaining drone approvals / licenses is largely through the submission of physical forms. Considering the age of digitization, the DGCA should make the application / approval process online / electronic.
- The remote pilot must acquire the same level of training as the aircrew of a manned aircraft or a private pilot license holder. Such a requirement is unreasonable and may give rise to a situation, wherein despite legalizing civil use of drones in India we won't find drone activities carried out due to the lack of trained remote pilots.

Beyond the draft guidelines, the law is wide open to exploration. No case law as such exists on drones, but the principles of torts such as trespass, nuisance, privacy, harassment, hurt

and negligence will play an instrumental role in the development of jurisprudence of drones' regulations. For e.g. flying a drone over another individual's land may account for trespass and nuisance. Although, airplanes, helicopters are allowed to fly over a person's private property as transit, there is no jurisprudence developed regarding the low-altitude flight on an aircraft. The nuisance requires establishing harm. Types of harm recognized under the claim of nuisance may include damage to the land, interference with the easement, discomfort or inconvenience. Although, minor inconvenience will not be considered as nuisance, spying or unauthorized surveillance may account for nuisance, particularly when done with a deliberate attempt of causing harassment.

Similarly, injuries caused due to crash of drone or technical defaults to an individual may trigger a claim of hurt and may also involve principles of vicarious liability of the owner or the operator of the drone causing the injury under the tort law. It will be interesting to observe how the courts will apply these principles on the functioning of drones and other new technologies, in due course of time.

Application of drones offers several advantages in various facets and it is imperative that these benefits can be availed by maximum number of people while mitigating the risks to the civil liberties. The prospective regulations must be drafted after considering the economic opportunities presented by drones as well as the risks they present to other aircrafts and people at land.

IV. Current Regulatory Framework

A. Manufacturing of Drones

In 2014 the Department of Industry Policy and Promotion (the “DIPP”) issued a Press Note No. 3 (2014 series) (“**Press Note**”) that provided a list of defence items whose manufacturing was subject to obtaining an industrial license. The Press Note also included UAVs and drones among other kinds of aircraft, hence

manufacturing of drones in India was subject to obtaining an industrial license.⁷⁵

The Press Note clarifies that even if the items listed in the Press Note are dual use items, i.e. items having military as well as civilian applications, an industrial license will be required for its manufacture.

Hence, it is mandatory under Indian law to procure an industrial license for the manufacture of drones and UAVs, even if it is being manufactured for civil purposes.

B. Foreign Direct Investment (“FDI”)

Once the civil use of drones is legalised in India, the drone industry in India is projected to grow by leaps and bounds, potentially making India an attractive destination for foreign investments.⁷⁶

As on today, drones fall under the list of defence items issued by the DIPP. Even after legalising its civil use, drones should continue to fall under the list but as a dual use item. Hence, it is speculated that any foreign investment made in manufacture of drones will attract the FDI regulations and the sectoral caps that are applicable to the defence sector.

The Indian government has brought major FDI policy reforms in a number of sectors including the defence sector. In the defence sector, FDI cap is up to 100% now, with up to 49% under the automatic route and beyond 49% through government approval route, wherever it is likely to result in access to modern technology or for other reasons to be recorded. This is one of the most significant policy initiatives by the Government in the defence sector. Earlier any foreign company looking to hold greater than a 49% stake in local ventures was subject to the condition to bring in “state-of-the-art technology”. However, in order to encourage greater foreign participation, “state-of-the-

art technology” was replaced by “modern technology or any other reason that may be recorded”.

Further, the Foreign Investment Promotion Board (“FIPB”) has been abolished, reducing a leg of the approval process. However, the applications for obtaining the government’s approval are to be submitted to a new and revamped portal called the Foreign Investment Facilitation Portal (“FIFP”) which is specifically administered by the DIPP to facilitate FDI. Relaxations of FDI regulations coupled with legalisation of drones in India, is likely to record heavy foreign investment in the drones industry.

V. Legal implication of use and development of drones in India

Although India does not have any concrete laws vis-à-vis Drones yet, there are various legal implications the existing laws may have on the operation of drones. Therefore, the legislators should also take into account different concerns, which may be presented due to the prospective regulations’ interaction with the existing legal framework, as set out below, and work to incorporate them into the necessary legislations.

VI. Intellectual property Rights

As more and more advanced drones are invented with unique utilities, it opens up avenues for protection by the grant of patents. For example, Amazon, one of the leading e-commerce websites, has applied for a patent for its delivery system drone that delivers products to the customer’s doorstep within 30 minutes of the order.⁷⁷ Boeing also obtained a patent for its “flying submarine” drone which is adaptable for both flight and water travel.⁷⁸ Under the

75. http://dipp.nic.in/sites/default/files/pn3_2014_o.pdf

76. <http://www.6wresearch.com/press-releases/india-uav-market-unmanned-aerial-vehicle-share-trends-forecasts-size-growth-opportunity-media-news.html>

77. <https://www.google.co.in/patents/US8825226>

78. <http://www.businessinsider.in/Boeing-has-patented-a-flying-drone-that-turns-into-a-submarine/articleshow/48504572.cms>

Indian Patents Act, 1970 (“Act”), although there is no express restriction on filing patent applications in relation to drone inventions, specific procedures need to be adhered to if the invention has an impact on defence⁷⁹ or national security, and the grant of such patents may be subject to prior government approvals (including the Indian Ministry of Defence).

VII. Security and Privacy Concerns

Although not categorically mentioned as a constitutional right, the honourable Supreme Court of India (the “Supreme Court”) at several occasions such as in the case of *Kharak Singh v. The State of Uttar Pradesh*,⁸⁰ *Gobind v. State of Madhya Pradesh*⁸¹ and *R Rajgopal & Anr v. State of Tamil Nadu*,⁸² has recognized “Right to Privacy” as a part of the “Right to Life and Personal Liberty” guaranteed under Article 19 and Article 21 of the Constitution of India. At present, the Right to Privacy Bill is currently at a consultative stage in the Parliament. Simultaneously, there is a writ petition pending in the Supreme Court, challenging the use of biometric traits for identification purposes, which requires considering whether “Right to Privacy” is a fundamental right of an individual guaranteed under the Constitution of India.⁸³ The other legislations providing for interception such as the Indian Telegraph Act, 1885 (the “Telegraph Act”) and the Information Technology Act, 2000 (the “IT Act”) lay down certain safeguards for preservation of civil liberties including privacy and expression rights. The government should factor these safeguards into consideration while deliberating on regulation of drones.

The Telegraph Act provides the framework for authorized phone tapping. Under Section 5(2) of the Telegraph Act, an order for tapping can only

be issued on the occurrence of ‘public emergency’ or ‘interest of public safety’, if it is necessary and expedient in the interest of sovereignty/ integrity of India, Security of the State, Friendly relations with foreign States, Public Order, Prevention of incitement the commission of any offence.⁸⁴ Further, the Indian Telegraph Rules, 1951 lay down the procedure to be followed for obtaining a phone tapping order. As per these rules, only the Union Home Secretary or State Home Secretary or in unavoidable circumstances a Joint Secretary, can issue the orders for interception.⁸⁵ The rules also require the reasons for interception to be recorded in writing and to be reviewed by a review committee. An interception order can stay in force only for 60 days and the information collected can be retained for six months.

The IT act provides for exhaustive rules for authorized monitoring of information stored on any electronic device or computer. The provisions for interception, i.e. Section 69 and Section 69B draw their language from the phone tapping provisions under the Telegraph Act.⁸⁶ The IT act further provides for IT (Procedure and Safeguards for Interception, Monitoring and Decryption of Information) Rules, 2009 and IT (Procedure and Safeguards for Monitoring and Collection of Traffic Data or Information), for invoking the provisions for monitoring of data.

As previously mentioned, drones amongst other things will also be used for investigation purposes, giving rise to concerns relating to unwarranted targeted or mass surveillance. Use of photography or filming technology by drones, may lead to unauthorized breach of privacy rights. However, the use of drones for surveillance cannot be rejected entirely, as it significantly helps law enforcement agencies in restricting unlawful activities and promoting national security. Therefore, an effective balance

79. Per Chapter VII of the Patents Act, 1970

80. 1963 AIR 1295

81. 1975 AIR 1378

82. AIR 1995 SC 264

83. <http://judis.nic.in/supremecourt/imgst1.aspx?filename=42841>

84. <http://sflc.in/wp-content/uploads/2014/09/SFLC-FINAL-SURVEILLANCE-REPORT.pdf>

85. http://www.dot.gov.in/sites/default/files/358%20GI-2014%20dated%208.2.2014_6.pdf

86. <http://sflc.in/wp-content/uploads/2014/09/SFLC-FINAL-SURVEILLANCE-REPORT.pdf>

needs to be achieved between the security and privacy concerns while ensuring sufficient flexibility to avail variety of beneficial drone uses.

It is noteworthy to mention that drones at several instances collect a lot of sensitive and personal data of individuals or classified information, which if compromised can lead to adverse consequences for a persons' privacy rights. With regard to collection of data by drones, the legislation should provide for safeguards such as mandating high encryption standards, provision for consent clause for collection of information, data retention policy etc. The legislation for drone governance, like the Telegraph Act and the IT Act should lay down adequate safeguards against the unwarranted collection and abuse of data by the government as well as by private players in the industry.

VIII. Tax Related Aspects of Drones

Developments in technology, internet, cloud computing, Unmanned Aerial Vehicles (UAVs), and IoT have given rise to various tax issues globally. There has been significant litigation in this respect, especially in relation to characterization of income and withholding taxes. Another emerging area where such issues that is likely to come up, is the usage of drones.

A. Direct Tax Regime in India

Taxation of income in India is governed by the provisions of the Income Tax Act, 1961 ('ITA'). Under the ITA, residents are subject to tax in India on their worldwide income, whereas non-residents are taxed only on income sourced in India. Companies are treated as residents in India, if: (a) they are incorporated in India, or (b) their place of effective management ("POEM") is in India. A company incorporated outside India may be taxable in India if considered as an Indian resident, due to its POEM being situated in India.

Business profits (net of permissible deductions) in case of resident companies are taxed at 30 percent if the turnover is more than INR 250

Crores (approx USD 38.5 Million).⁸⁷ In order to make medium and small enterprises more viable and encourage competition, such enterprises are taxed at reduced rate to 25 percent (as opposed to the current rate of 30 percent).

Ordinarily, in the absence of a permanent establishment ("PE") or business connection ("BC") in India, non-resident companies are not taxable in India on their India-source business profits. However, if there is a PE / BC, the net profits of the non-resident company attributable to the PE / BC in India are taxable at the rate of 40 percent, unless such income qualifies to be treated as royalties or fees for technical services ("FTS") which are taxable at the rate of 10% on the gross amount received.⁸⁸

However, if a taxpayer is resident in a country with which India has a Double Taxation Avoidance Agreement ("DTAA" or "tax treaty"), the taxpayer has the option of being taxed under the provisions of the tax treaty or the ITA to the extent it is more beneficial to the taxpayer.⁸⁹ Withholding taxes may apply in a cross border scenario where payments made to a non-resident are taxable in India.

Permanent Establishments:

Traditionally, a PE may be constituted if a foreign entity generates income from another country either through a fixed place of business or through employees or dependent agents located in the other country.

87. All tax rates mentioned in this paper are exclusive of surcharge and cess; in case of residents, surcharge of 12% / 7% is applicable on the income-tax if their total taxable income is in excess of INR 10 crores / in excess of INR 1 crore but less than INR 10 crores respectively; in case of non-residents, the surcharge is 5% / 2% respectively for such taxable income; for both resident and non-residents, a cess of 4% is applicable on the total of the income-tax and surcharge.

88. After the amendment to the IT Act through the Finance Act, 2016 the tax rates for royalties and FTS has been reduced to 10% from the 25%. This is significant since most treaties provide for a 15% cap on the tax that can be imposed by India. In light of this change the availability of tax treaty benefits is not as important as it was before.

89. Section 90(2) of ITA; India has entered into more than DTAAAs. In order to avail benefits under the DTAA, a non-resident is required to furnish a tax residency certificate ("TRC") from the government of which it is a resident in addition to satisfying the conditions prescribed under the DTAA for applicability of the DTAA. Further, the non-resident should also file tax returns in India and furnish certain prescribed particulars in Form 10F to the extent they are not contained in the TRC.

However, these rules were formulated in the era of brick and mortar, and did not envisage the new and disruptive business models enabled by the onset of the digital economy, propelled by technological advancements, including UAVs. These unique business models have given rise to concerns that multinational enterprises may be able to rely on the existing tax rules to artificially reduce taxable income or shift profits to low-tax jurisdictions in which little or no economic activity is performed. These concerns have prompted countries around the world to come together to revise the international tax framework through the Base Erosion and Profit Shifting Action Plans (“**BEPS Action Plan**”) and the Multilateral Instrument (“**MLI**”).⁹⁰ Among other things, the MLI proposes an expansion of the PE definition, which is hoped aimed at specifically at business models precipitated by the digital economy.⁹¹

Industries and sectors where such drones are likely to be used, specifically for commercial purposes are global in nature. It is possible that the usage of drones by these enterprises in multiple jurisdictions could potentially give rise to PE status in such jurisdictions. In such cases, the manner in which such drones are to be deployed would have a significant bearing on the level of PE risk involved.

Just one example is Amazon, which is reported to be looking at the option of using drones for delivery of goods instead of delivery executives. Owing to the nature of their global operations, their headquarters may be in one jurisdiction, but it may have a presence in other jurisdictions in the form of warehouses, branch offices, liaison offices, godowns etc. to effectively carry out business activities in each jurisdiction. The likelihood of the existence of a PE increases in such scenarios. Whether the use of drones

increases the risk of a PE being constituted in any of such jurisdictions would depend greatly on the manner in which the drones are integrated into Amazon’s business model.

Patent Box Regime

India has also introduced a new patent box regime.⁹² Under the patent box regime, worldwide income derived by an Indian resident from a patent developed and registered in India is taxed on a gross basis at a concessional rate of 10%. The patent box is an attractive proposition for India-based drone developers.

B. Indirect Tax Framework

The GST regime is comprised of three major pillars: the Central Goods and Services Tax Act, 2017 (“**CGST Act**”) which provides for the taxing powers of the Central Government, individual State / Union Territory Goods and Services Tax Acts (“**SGST Act**” and “**UTGST Act**” respectively) which provide for the taxing powers of each State / Union Territory, and the Integrated Goods and Services Tax Act, 2017 (“**IGST Act**”), which grants exclusive rights to the Centre to tax inter-state commerce.

Under the GST regime the “supply” of goods, or services, or both, is treated as the taxable event, with different taxes applying to inter-state supply and intra-state supply. Every inter-state supply of goods or services is liable to IGST under the IGST Act, while every intra-state supply of goods or services is liable to both CGST under the CGST Act, and SGST / UTGST under the applicable SGST Act / UTGST Act. Supply is treated as either inter-state, or intra-state, depending on the location of the supplier, and the “place of supply” determined in accordance with the provisions of the IGST Act.

90. The latter is a multilateral treaty designed to simultaneously amend a majority of existing bilateral tax treaties to bring them in line with the proposals set out in the BEPS Action Plans.

91. This is not to say that foreign companies using business models involving the use of technology (including drones) do not run the risk of having a PE in another country. Rather, once in effect, the BEPS proposals substantially increase that risk.

92. Section 115BBF of the ITA, inserted vide the Finance Act, 2016.

GST is levied at rates that vary between nil – 28% depending on the rate schedule applicable to the supply in question. To prevent cascading of taxes, a uniform input tax credit system is available in respect of input supplies of goods or services used or intended to be used in the provision of output supplies of goods or services or both. GST is a consumption tax and is typically passed on to the consumer of the good / service as part of the price.

As a general rule, the import of goods or services or both into India qualifies as a taxable inter-state supply chargeable to IGST, while the export of goods or services or both from India is treated as a zero-rated supply not chargeable to tax under the GST regime.^{7.3.2.2 Value Added Tax.}

VAT is a state specific levy and almost all states in the country has enacted specific legislations for the levy and collection of VAT, which is a multi-stage tax with the provision to allow 'input tax credit' on tax at an earlier stage, which can be appropriated against the VAT liability on subsequent sale. VAT was introduced in India to prevent leakages in tax and to avoid the cascading effect of taxes prevalent under the erstwhile sales tax regime. At present VAT is applicable at rates varying between 0 per cent and 36 per cent.

However, with the introduction of the GST in India, the States power to levy VAT has been significantly curtailed. From July 1, 2017, VAT may be levied only on the sale within a State of petroleum crude, high speed diesel, motor spirit (commonly known as petrol), natural gas, aviation turbine fuel and alcoholic liquor for human consumption.^{7.3.2.3 Excise Duty}

Prior to the introduction of GST, CENVAT was a duty of excise which was levied on all goods that were produced or manufactured in India, marketable, movable and covered by the excise legislation. The peak duty rate applicable was 12.5 per cent, although rates varied based on the goods involved.

In order to avoid the cascading of excise duty and double taxation, the CENVAT scheme had been framed under the Central Excise Act, 1944 and the CENVAT Credit Rules. Under

the CENVAT Credit Rules, a manufacturer of excisable goods can avail of credit of duty paid on certain inputs and capital goods barring certain inputs used in the specified manufacture of certain products. The credit can be utilised towards the duty payable on removal of the final product. It must also be noted that the CENVAT scheme also took into account credits in respect of any service tax paid by the manufacturer on input services received.

With the introduction of the GST in India, the scope of CENVAT has been significantly limited. From July 1, 2017, CENVAT may be levied only on the production or manufacture of petroleum crude, high speed diesel, motor spirit (commonly known as petrol), natural gas, aviation turbine fuel and alcoholic liquor for human consumption.^{7.3.2.4 Customs Duty}

Customs duty is levied under the Customs Act, 1962. The duty is payable on goods imported into India as also on certain specified goods exported out of India. Prior to the introduction of GST in India, customs duty was made of three components: a basic customs duty ("BCD"); a countervailing duty in lieu of excise duty ("CVD"); and a countervailing duty in lieu of state and local taxes ("ACD"). Additionally, education cess and higher education cess was also imposed. The CVD was levied on the aggregate of the CIF value of the imports and the basic import duty. It was equal to the excise duty that was leviable in respect of the same product if it were to be manufactured in India and was primarily levied to protect indigenous manufacturing units. The ACD was levied on the aggregate of the BCD and CVD and was levied at 4 percent and was primarily levied to countervail the CST or VAT that would have been applicable in respect of the product in India if sold by an indigenous dealer.

The rates of import duty are specified in the Customs Tariff Act, which classifies goods into numerous chapters. Currently, the peak rate of customs duty in India stands at approximately 29 per cent which includes a peak rate of BCD at 10 percent, CVD at 12.5 percent, ACD at 4 percent and additionally, the education and higher education cess.

With the introduction of GST, the customs framework has been significantly revamped. Import of goods is now subject to IGST at the rate prescribed for inter-state supply of the goods concerned, in addition to basic customs duty, while most other duties have been abolished, or significantly curtailed.

IX. The Road Ahead

The drones industry has a potential of providing an economic boost along with attracting global investments. The economic benefits also play into the need to innovate, potentially not only delivering better drones, but associated inventions as well. However, the rise of drones has presented several policy challenges in terms of personal privacy, public safety, international airspace, civil rights etc. Thus, the success of drones would depend on achieving a symbiotic integration of law, tax and civil liberties.

As drones gain more popularity in the eyes of the public and garner support for potential markets, a timely institution of robust and flexible drone regulations would go a long way towards tapping into and building upon this opportunity.

Taking lessons from history, different stakeholders should come together and work towards providing a comprehensive policy framework for drone regulation so as to ensure that a balance between innovation, progress and safety is adequately maintained.

About NDA

At Nishith Desai Associates, we have earned the reputation of being Asia's most Innovative Law Firm – and the go-to specialists for companies around the world, looking to conduct businesses in India and for Indian companies considering business expansion abroad. In fact, we have conceptualized and created a state-of-the-art Blue Sky Thinking and Research Campus, Imaginarium *Aligunjan*, an international institution dedicated to designing a premeditated future with an embedded strategic foresight capability.

We are a research and strategy driven international firm with offices in Mumbai, Palo Alto (Silicon Valley), Bangalore, Singapore, New Delhi, Munich, and New York. Our team comprises of specialists who provide strategic advice on legal, regulatory, and tax related matters in an integrated manner basis key insights carefully culled from the allied industries.

As an active participant in shaping India's regulatory environment, we at NDA, have the expertise and more importantly – the VISION – to navigate its complexities. Our ongoing endeavors in conducting and facilitating original research in emerging areas of law has helped us develop unparalleled proficiency to anticipate legal obstacles, mitigate potential risks and identify new opportunities for our clients on a global scale. Simply put, for conglomerates looking to conduct business in the subcontinent, NDA takes the uncertainty out of new frontiers.

As a firm of doyens, we pride ourselves in working with select clients within select verticals on complex matters. Our forte lies in providing innovative and strategic advice in futuristic areas of law such as those relating to Blockchain and virtual currencies, Internet of Things (IOT), Aviation, Artificial Intelligence, Privatization of Outer Space, Drones, Robotics, Virtual Reality, Ed-Tech, Med-Tech & Medical Devices and Nanotechnology with our key clientele comprising of marquee Fortune 500 corporations.

The firm has been consistently ranked as one of the Most Innovative Law Firms, across the globe. In fact, NDA has been the proud recipient of the Financial Times – RSG award 4 times in a row, (2014-2017) as the **Most Innovative Indian Law Firm**.

We are a trust based, non-hierarchical, democratic organization that leverages research and knowledge to deliver extraordinary value to our clients. Datum, our unique employer proposition has been developed into a global case study, aptly titled 'Management by Trust in a Democratic Enterprise,' published by John Wiley & Sons, USA.

A brief chronicle our firm's global acclaim for its achievements and prowess through the years -

- **AsiaLaw 2019:** Ranked 'Outstanding' for Technology, Labour & Employment, Private Equity, Regulatory and Tax
- **RSG-Financial Times:** India's Most Innovative Law Firm (2014-2017)
- **Merger Market 2018:** Fastest growing M&A Law Firm
- **IFLR 1000 (International Financial Review - a Euromoney Publication):** Tier 1 for TMT, Private Equity
- **IFLR:** Indian Firm of the Year (2010-2013)
- **Legal 500 2018:** Tier 1 for Disputes, International Taxation, Investment Funds, Labour & Employment, TMT
- **Legal 500 (2011, 2012, 2013, 2014):** No. 1 for International Tax, Investment Funds and TMT

- **Chambers and Partners Asia Pacific (2017 – 2018):** Tier 1 for Labour & Employment, Tax, TMT
- **IDEX Legal Awards 2015:** Nishith Desai Associates won the “M&A Deal of the year”, “Best Dispute Management lawyer”, “Best Use of Innovation and Technology in a law firm” and “Best Dispute Management Firm”

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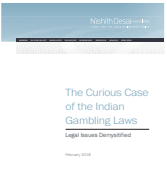

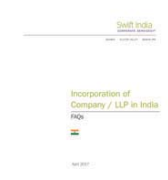




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Research @ NDA

Research is the DNA of NDA. In early 1980s, our firm emerged from an extensive, and then pioneering, research by Nishith M. Desai on the taxation of cross-border transactions. The research book written by him provided the foundation for our international tax practice. Since then, we have relied upon research to be the cornerstone of our practice development. Today, research is fully ingrained in the firm's culture.

Our dedication to research has been instrumental in creating thought leadership in various areas of law and public policy. Through research, we develop intellectual capital and leverage it actively for both our clients and the development of our associates. We use research to discover new thinking, approaches, skills and reflections on jurisprudence, and ultimately deliver superior value to our clients. Over time, we have embedded a culture and built processes of learning through research that give us a robust edge in providing best quality advices and services to our clients, to our fraternity and to the community at large.

Every member of the firm is required to participate in research activities. The seeds of research are typically sown in hour-long continuing education sessions conducted every day as the first thing in the morning. Free interactions in these sessions help associates identify new legal, regulatory, technological and business trends that require intellectual investigation from the legal and tax perspectives. Then, one or few associates take up an emerging trend or issue under the guidance of seniors and put it through our "Anticipate-Prepare-Deliver" research model.

As the first step, they would conduct a capsule research, which involves a quick analysis of readily available secondary data. Often such basic research provides valuable insights and creates broader understanding of the issue for the involved associates, who in turn would disseminate it to other associates through tacit and explicit knowledge exchange processes. For us, knowledge sharing is as important an attribute as knowledge acquisition.

When the issue requires further investigation, we develop an extensive research paper. Often we collect our own primary data when we feel the issue demands going deep to the root or when we find gaps in secondary data. In some cases, we have even taken up multi-year research projects to investigate every aspect of the topic and build unparalleled mastery. Our TMT practice, IP practice, Pharma & Healthcare/Med-Tech and Medical Device, practice and energy sector practice have emerged from such projects. Research in essence graduates to Knowledge, and finally to *Intellectual Property*.

Over the years, we have produced some outstanding research papers, articles, webinars and talks. Almost on daily basis, we analyze and offer our perspective on latest legal developments through our regular "Hotlines", which go out to our clients and fraternity. These Hotlines provide immediate awareness and quick reference, and have been eagerly received. We also provide expanded commentary on issues through detailed articles for publication in newspapers and periodicals for dissemination to wider audience. Our Lab Reports dissect and analyze a published, distinctive legal transaction using multiple lenses and offer various perspectives, including some even overlooked by the executors of the transaction. We regularly write extensive research articles and disseminate them through our website. Our research has also contributed to public policy discourse, helped state and central governments in drafting statutes, and provided regulators with much needed comparative research for rule making. Our discourses on Taxation of eCommerce, Arbitration, and Direct Tax Code have been widely acknowledged. Although we invest heavily in terms of time and expenses in our research activities, we are happy to provide unlimited access to our research to our clients and the community for greater good.

As we continue to grow through our research-based approach, we now have established an exclusive four-acre, state-of-the-art research center, just a 45-minute ferry ride from Mumbai but in the middle of verdant hills of reclusive Alibaug-Raigadh district. **Imaginarium AliGunjan** is a platform for creative thinking; an apolitical ecosystem that connects multi-disciplinary threads of ideas, innovation and imagination. Designed to inspire 'blue sky' thinking, research, exploration and synthesis, reflections and communication, it aims to bring in wholeness – that leads to answers to the biggest challenges of our time and beyond. It seeks to be a bridge that connects the futuristic advancements of diverse disciplines. It offers a space, both virtually and literally, for integration and synthesis of knowhow and innovation from various streams and serves as a dais to internationally renowned professionals to share their expertise and experience with our associates and select clients.

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