GLOBAL COMMERCIAL DRONE ENABLED-SERVICES MARKET

2016-2020

TECHNAVIO.COM

AMERICAS

CANADA
36 Toronto Street, #505
Toronto, ON M5C 2C5
americas@technavio.com

UNITED STATES
110 E Schiller Street, #208
Chicago, IL 60126
americas@technavio.com

EUROPE, MIDDLE EAST, AFRICA

UNITED KINGDOM
8 Wimpole Street
London W1G 9SP
emea@technavio.com

ASIA-PACIFIC

INDIA
First Floor, Left Wing
Embassy Signet, Cessna Business Park
Kadubeesanahalli
Bangalore, Karnataka 560 103
asia@technavio.com

CHINA
Tianchen Building, Room 1308
12 Chaoyangmenwai Street
Chaoyang District, Beijing
asia@technavio.com

ALL MEDIA INQUIRIES

media@technavio.com

Table of contents

List of exhibits

PART 01:

Executive summary

2015 MARKET SIZE	2020 MARKET SIZE
$1,022 MILLION	$4,663 MILLION
2016 MARKET GROWTH RATE	2020 MARKET GROWTH RATE
12.52%	60.63%

Highlights

- Asia-Pacific (APAC) is expected to be the fastest-growing market during the forecast period, growing at a CAGR of 81.18%. The high growth rate is because of the increasing acceptance of commercial drone-enabled services in the region.
- The adoption of commercial drone-enabled services for construction and the study of structures is expected to be high in the market compared with other segments. They help in better project management.
- There are many vendors operating in the Asian market. However, companies that are based in China prefer generating revenue from the international market, as the device is not yet popular in Asian countries.

PART 02:

Scope of the report

Market overview

This report covers the present scenario and the growth prospects of the global commercial drone-enabled services market for 2016-2020. To calculate the market size, the report considers the revenue generated from the sales of commercial drone-enabled services. The report provides the revenue, which is calculated based on the average selling price of commercial drones. It also presents the vendor landscape and a corresponding detailed analysis of the top vendors in the market. It discusses the major drivers that are influencing market growth, current challenges faced by vendors and the market as a whole, and key emerging trends affecting the current and future market scenarios.

Market segmentation

The report segments the market on the following bases and discusses in detail the factors affecting every segment during the forecast period:

By application

Delivery services

Drones are used to deliver small packages and couriers.

Disaster management

Drones help in quickly gathering information after a natural or man-made disaster.

Photography and entertainment

Drones are used for filming movies and playing games. They are also used for topographical analysis for agriculture and infrastructure development.

Surveillance

Drones are used for security purposes.

Weather forecast

Drones can be used to understand and monitor natural calamities such as hurricanes and tornadoes more closely.

Others

Drones can be used for various other purposes such as journalism.

By industry

Agriculture

Drones help farmers to monitor, manage, and improve the yield.

Construction

Drones help contractors in project management.

Media and entertainment

Drones are used for filming movies, ads, and television series. They can also be used for movie and product promotions.

Security

Drones are used as surveillance cameras to increase public safety.

Telecom

They help in addressing infrastructure-related issues during harsh weather conditions.

Transportation

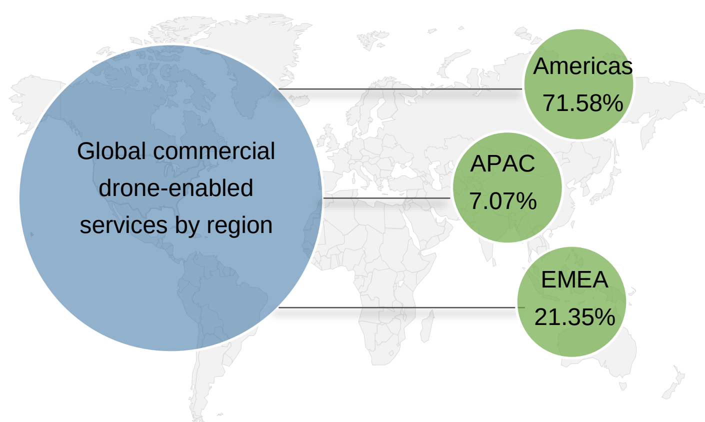
Drones are used to deliver small packages and couriers. They can also be used to deploy small rescue packages during a search and rescue mission.

Others

Other industries include the advertising, news broadcasting, tourism, and food industries.

By geography

Exhibit 01: Global commercial drone-enabled services market by geography 2015



Source: Technavio

Base year and forecast period

Throughout the report, CY2015 is considered as the base year. All calculations involving quantitative data are based on the base year. In the report, actual values are used for 2015, while the values for 2016-2020 are predicted.

Vendor selection criteria

The report lists the leading vendors that are active in providing products and services related to advertising. It includes vendors across all geographical regions. It provides the performance and market dominance of vendors in terms of experience, product portfolio, geographical presence, financial condition, R&D, and customer base.

Summation errors

The numbers in the report have been rounded off to two decimal points for the convenience of the reader. Any summation errors are not mathematical instead are for readability purpose.

Top-vendor offerings

Exhibit 02: Product offerings

Company	Products
3D Robotics	• Solo • Site Scan • Enterprise
AeroVironment	• Digital Data Link (DDL) • Pocket RVT • Puma AE • Qube • Raven B • Sensors and Capabilities

Company	Products
	• Shrike • Switchblade • Wasp AE
DJI	• Inspire 1 accessories • Inspire 1 pro / raw • Inspire 1 • Osmo + • Osmo mobile • Osmo • Phantom 3 series • Phantom 4 • Ronin • Ronin thumb controller • Ronin-M • Ronin-MX • Zenmuse X series cameras comparison • Zenmuse X5 series
Leptron Unmanned Aircraft Systems	• RDASS • Avenger • MicaSense RedEdge

Company	Products
Parrot	• AR drone 2.0
	• Bebop 2
	• Parrot AR Drone 2.0 elite edition
	• Parrot AR Drone 2.0 GPS edition
	• Parrot AR Drone 2.0 power edition
	• Parrot Bebop 2 & sky-controller black edition
PrecisionHawk	• Lancaster
Trimble UAS	• UX5
	• UX5 HP
	• ZX5

Source: Technavio

PART 03:

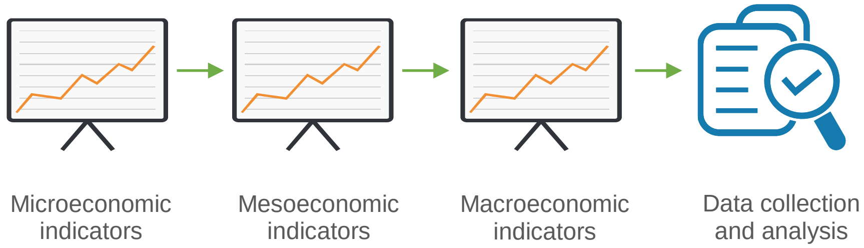
Market research methodology

Research methodology

This Technavio report is based on the synthesis, analysis, and interpretation of information about the global commercial drone-enabled services market collected from specialized sources. We have derived insights using a mix of primary and secondary research with an aim to provide a holistic picture of the market.

Economic indicators

Technavio has conducted a detailed study of the global economic conditions and other economic indicators to assess their impact on the current market landscape and to make informed predictions about future market scenarios.



PART 04:
Introduction

Key market highlights

Key customer segment

- Individual users

Key market challenges

- Stringent government regulations
- Connectivity issues with other electronic devices
- Drone hacking
- Low awareness among general masses
- Inaccuracy of sensors

Key market drivers

- Integration of commercial drones with VR technology
- High adoption of commercial drone-enabled services in industrial sector
- Increase in adoption of multirotor drones
- Rise in demand for commercial drone-enabled services in transportation sector

Key market trends

- Emergence of drone racing as a major sport event
- Shift in demand to developing nations
- Growing popularity of camera drones
- Rise in demand for high-quality imaging and accurate sensors
- High adoption of drones for advertisements

Drones are UAVs that are flown and controlled using handheld or GPS remote controls. The accelerometers attached to the drones help in controlling the drone while

it is flying. Drones are used for surveillance, rescue missions, high-altitude photography, natural or man-made disaster management, product delivery, monitoring, internet connectivity, and photography and entertainment.

With technological advances, drones have gradually evolved in terms of their design, data processing and analyzing capabilities, and operation duration. Drones manufactured in 2015 can capture and process HD videos and pictures. They can also collect surveillance data in real time. Drones are very economical. They help consumers save time and money.

We expect the drone industry to create more than 50,000 jobs in the US during 2015-2020 and to contribute around $40 billion to the US economy. Once the FAA approves the integration of UAVs into the National Airspace System, up to 30,000 drones will populate the US airspace in the first year.

The commercial use of drones is restricted because of privacy concerns. Many state legislatures in the US are addressing this issue: 34 states are currently working on passing regulations to restrict the use of drones in protected areas. In addition, private companies are working on handling privacy concerns.

Commercial drone-enabled services are expected to be widely adopted in the agriculture sector during the forecast period. Drones help in improving the yield and the overall quality of the yield. It reduces the manual inspection of crops, as it helps farmers to detect the health of the crop without physically visiting the crops. This allows farmers to focus on improving the health conditions of the crops. Major vendors such as Facebook and Google are planning to deploy solar-powered drones as hotspots to provide internet access and improve connectivity in remote regions. In addition, Amazon.com is working on its drone delivery system called Amazon Prime Air. Its aim is to deliver goods in less than 30 minutes after an order is placed. Drones can be used in almost all sectors because of their unique capabilities.

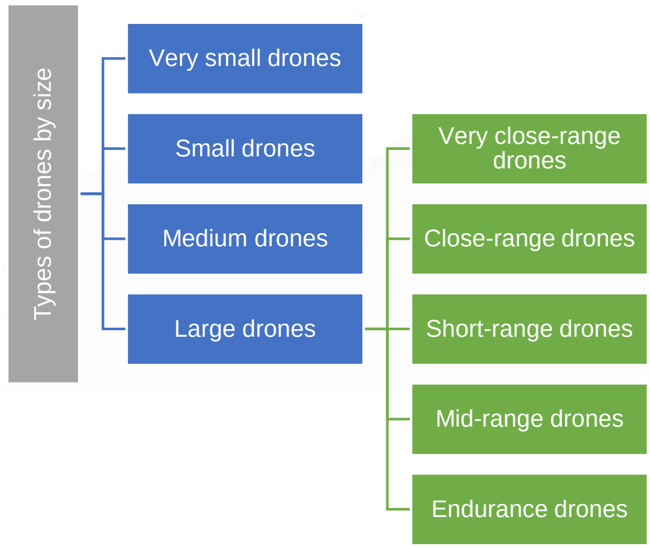
In addition, the growth in the commercial-purpose drones market is hampered by stringent government regulations over security and safety. The scarcity of trained pilots and lack of efficient air traffic management systems for drones limit the market growth. Nevertheless, the increasing use of drones by law enforcement agencies across the globe is expected to boost the market growth during the forecast period.

PART 05:
Market landscape

Types of drones by size

Based on size, drones are classified into four categories. These categories include both commercial and consumer drones.

Exhibit 03: Types of drones by size



Source: Technavio

Very small drones

The sizes of these drones range from 0.4 inches to 20 inches. They are also called mini or nano drones. The nano drone is designed in the shape of an insect. Its small size and light weight make it suitable for purposes such as spying and conducting biological warfare.

Small drones

The sizes for these drones range from 20 inches to 79 inches. They are small in size and are comparatively heavy. They are thrown in the air with the hand and then steered. The AAI RQ-7 Shadow used by the US Army is an example of small drones.

Medium drones

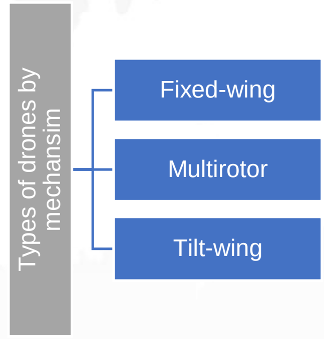
The average wing span of a medium drone ranges from 2 m to 10 m. It is larger than a small drone and much heavier. Owing to its weight and size, it cannot be carried by a single person. UK Watchkeeper is an example of this drone.

Large drones

They are the size of aircraft and are found in military facilities.

Type of drones by mechanism

Exhibit 04: Types of drones by mechanism



Source: Technavio

Fixed-wing drones

Fixed-wing drones have a structure that resembles an airplane. The structure of these drones enables them to travel at a faster speed and have a longer flight time. They can be easily used for surveying large areas. Furthermore, fixed-wing drones carry heavier loads and consume less energy. They can carry bigger and better sensors and cameras. However, fixed-wing drones cannot hover, as they require air moving over their wings to generate lift, and so must continue moving in forward motion. They also need a runway or launcher for taking off and landing. These features make them unfit for applications in smaller areas, such as inspection and surveillance.

Multirotor drones

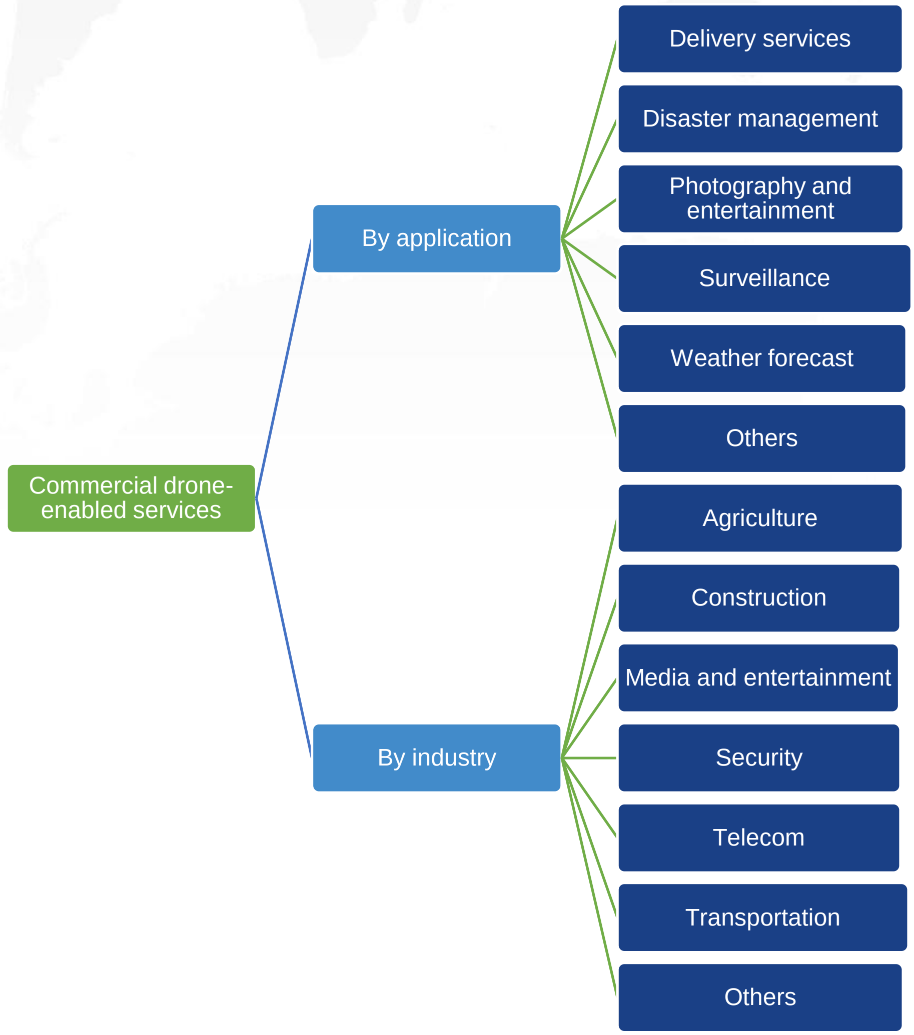
Multirotor UAVs are controlled by varying the rotor thrust and torque. They are capable of hovering in a fixed position and flying in any direction. They do not require a runway to get airborne. Multirotor drones have slower maximum speeds and shorter flight times. Multirotor UAVs may have four, six, or eight rotors. There are many benefits of having multiple rotors. For instance, if one of the rotors fail, the drone can still stay in the air.

Tilt-wing drones

Tilt-wing drones can hover when required, which can also transition to faster and more efficient fixed-wing flight. They capture some of the best features of the other two types: they can fly longer distances and do not need a runway, and they can hover and also achieve higher flight speed. Currently, the number of tilt-wing drones in the market is low. However, companies, including Amazon.com, are working on new models, particularly for transport applications.

Market overview

Exhibit 05: Overview of commercial drone-enabled services market

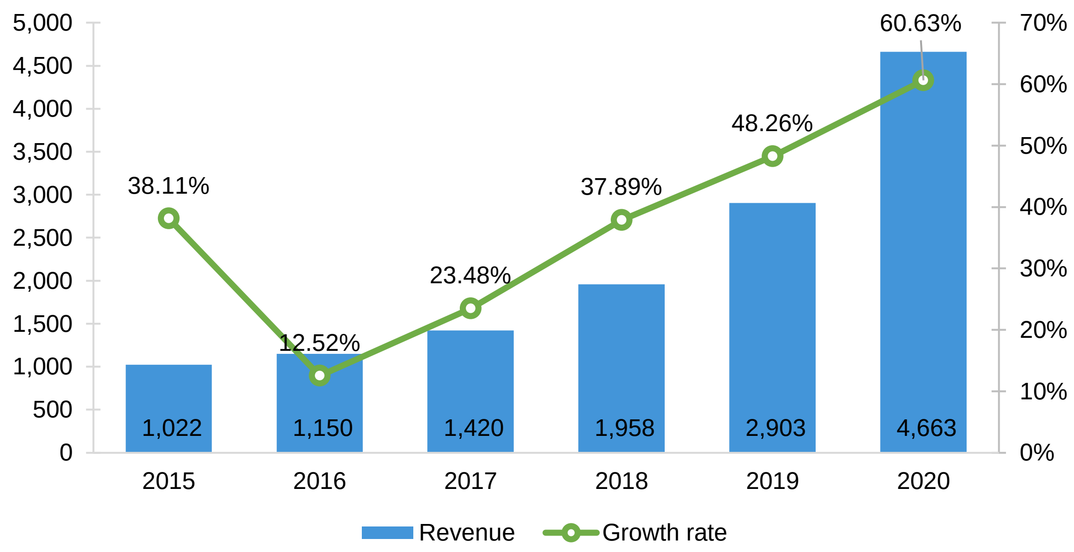


Source: Technavio

Market size and forecast

Commercial drones are piloted and unpiloted aerial vehicles that are used for various purposes in sectors such as retail, military, and homeland security. The growing application of commercial drone-enabled services in construction, agriculture, and law enforcement agencies is expected to be a major driver for the market during the forecast period. Major e-commerce companies such as Amazon.com and Google are using drone services for the delivery of packages. In July 2015, Amazon.com suggested to allocate separate airspace zones for the operation of commercial drones. However, the US government has not yet granted the company permission to use drones for delivery purposes.

Exhibit 06: Global commercial drone-enabled services market 2015-2020 ($ millions)



Source: Technavio

The commercial drone-enabled services market is expected to grow at a CAGR of 35.47% during the forecast period. Although the use of commercial drone-enabled services is permitted in various sectors such as construction and media and entertainment, the FAA in the US and European Aviation Safety Agency in Europe banned the use of commercial drones in the transportation and logistics segment. The ban was implemented to maintain the security of citizens. Countries were denied permission to fly drones for commercial purposes because of the limited availability of staff for air traffic management and concerns about increasing air traffic. However, owing to the growth potential of the market, governments of countries are formulating rules and regulations such as maintaining the flight height and speed to ensure the safety of users and the surroundings. Once the regulations regarding drones are

relaxed, drones will be extensively used for applications like package delivery, surveillance, journalism, and aerial photography.

We expect the application of drones to be the highest in agriculture during the forecast period. In terms of market share, the construction industry is expected to maintain the largest market share.

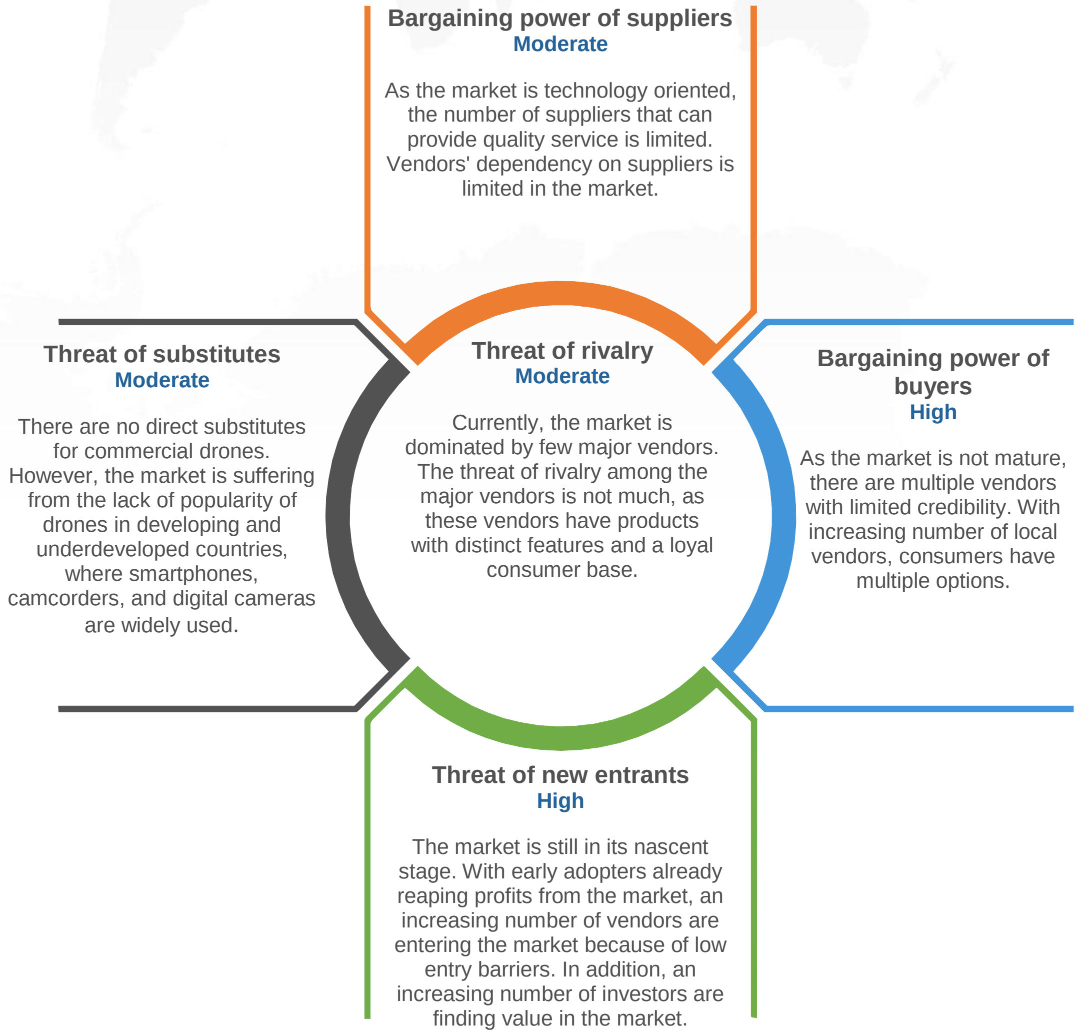
Commercial drone-enabled services are also used in wildlife safety and security. Poaching of animals has become one of the major concerns globally. Drones are used to monitor wildlife premises to protect wildlife against illegal loggers. In addition, it helps caretakers in monitoring and maintaining the health conditions of animals. Commercial drone-enabled services are widely used in the media and entertainment sector for shooting films and TV series. In 2014, the FAA granted various movie and television production houses, such as Aerial MOB, Aerial HeliVideo Productions, and Astraeus, permission to use camera-equipped commercial drones on shooting sites. In addition, major vendors such as Facebook and Google are planning to use solar-powered drones as hotspots to provide internet access in remote regions.

With the huge growth potential of the commercial drone-enabled services market, vendors are focusing on expanding their reach to broader domains such as delivery services, infrastructure monitoring, emergency management, and weather forecasting. Owing to the growing security concerns, many vendors are launching drones to detect any unknown drones that are entering private and restricted areas. In April 2015, Japanese authorities found a small drone with traces of radiation on the roof of the Prime Minister's office, raising concerns about a possible terrorist attack. In order to address the situation, Tokyo Police, in December 2015, launched their first anti-drone squad, which includes big net-wielding drones, to enforce the drone ban in urban areas. Police drones are able to catch offending drones in the act and set them down gently.

Drones are also being integrated with light detection and ranging (LiDAR) systems. The laser-based scanning technique enables machines to survey landscapes and build 3D images for analysis. The adoption of drones for surveying mobile phone use is one of the future applications of drones. A drone with a receiver can fly around cell towers to measure the signal strength in places that are otherwise difficult to reach. Drones can also be deployed to locate problems in high-voltage lines and wind farms, thus saving on costs. They can be used in air-sea rescue missions, avoiding the use of expensive helicopters and ships. With advances in drone technology, the application and potential of commercial-purpose drones will be far ranging.

Five forces analysis

Exhibit 07: Five forces analysis



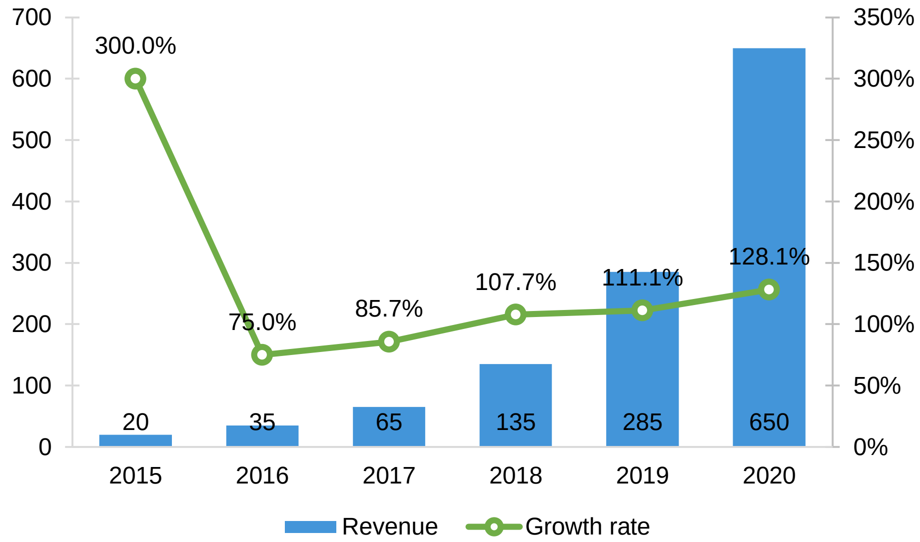
Source: Technavio

PART 06:
Market segmentation by application

Global commercial drone-enabled services market by delivery services

During the forecast period, the commercial drone-enabled services market by delivery services is expected to grow at a CAGR of 100.62% in terms of revenue. Commercial drone-enabled services are expected to play an important role in the technological shift that is taking place in the industry. In 2013, Amazon.com announced that it is planning to launch Amazon Prime Air for the delivery of small packages. However, the plan of the company was hindered by the US government, as it did not legalize the use of drones for delivery purposes. In 2015, the US government granted the company permission to test-fly the prototype. In addition, the FAA approved the use of only those commercial drones that weigh less than 55 lbs. Each drone must have its own pilot. This will have a significant impact on the operation costs.

Exhibit 08: Global commercial drone-enabled services market by delivery services 2015-2020 ($ millions)



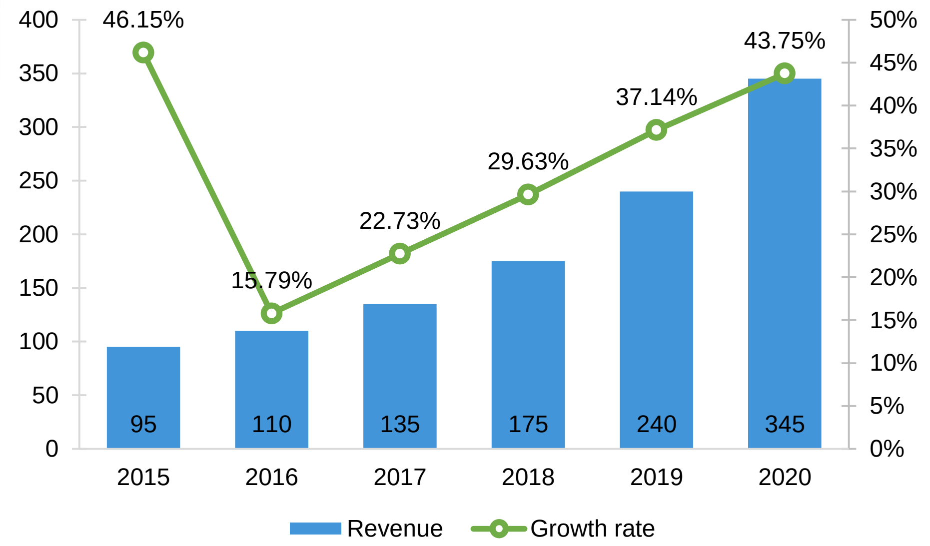
Source: Technavio

Drones are widely used for transportation and delivery purposes. They can be used to deliver couriers and small packages such as pizzas, letters, medicines, and beverages at short distances. They are also used in fleet management. Drones help in lowering operational costs, as it eliminates the need for human labor to deliver goods. This is one of the major factors that will drive the market growth during the forecast period.

Global commercial drone-enabled services market by disaster management

Drones are extensively used for the collection of information and data regarding natural or man-made disasters. The data helps disaster management teams to organize search and rescue missions accordingly. The small size of drones makes them versatile in nature. They can be deployed at the affected site to collect information that can be used by rescuers for navigation and the quick rescue of people. Rescuers can access higher grounds without wasting resources on helicopters by using drones that are equipped with HD cameras and radars.

Exhibit 09: Global commercial drone-enabled services market by disaster management 2015-2020 ($ millions)



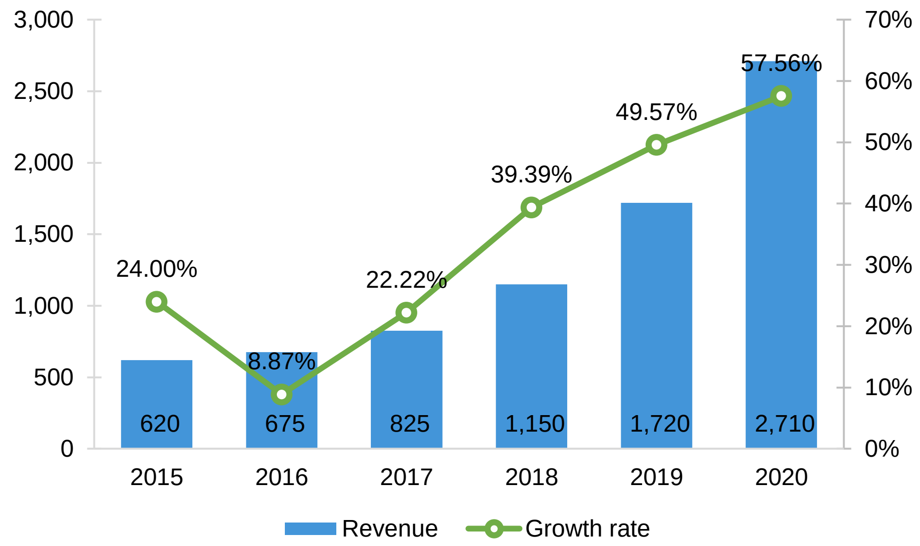
Source: Technavio

During the forecast period, the commercial drone-enabled services market by disaster management is expected to grow at a CAGR of 29.43% in terms of revenue. Advanced drones are equipped with thermal sensors that can be used efficiently during search and rescue missions. They are largely used for search operations conducted at night or in harsh terrains. Time is a crucial factor in such situations. Drones are handy as they can be easily deployed. For example, a drone can be used for the delivery of medical supplies, food, and water. It can also be used as a walkie-talkie and GPS tracker during rescue operations. In 2015, the Utah Division of Emergency Management used drones to closely monitor floods at flash flood spots in Hildale and Colorado City, US.

Global commercial drone-enabled services market by photography and entertainment

Commercial drone-enabled services have been gaining popularity in the photography and entertainment sector. The companies operating in this industry have been open to the adoption of new technologies in order to enhance the products produced such as movies, TV series, games, and advertisements. Drones are used for taking photos and shooting videos of various landscapes.

Exhibit 10: Global commercial drone-enabled services market by photography and entertainment 2015-2020 ($ millions)



Source: Technavio

During the forecast period, the commercial drone-enabled services market by photography and entertainment is expected to grow at a CAGR of 34.31% in terms of revenue. Commercial drone-enabled services are primarily used for filming and aerial photography. Drones are used to take photos and shoot videos and films from all possible angles that would otherwise require a helicopter. Drones have been used in Hollywood movies like Captain America: Civil War in 2016, Jurassic World in 2015, and Spectre in 2015. Commercial drone-enabled services are also proving to be useful in broadcasting news. BBC has formed a separate in-house drone team to shoot sports events. Drones are capable of taking close shots of athletes without distracting them. The company used drone-enabled services to shoot sports events during the 2014 Winter Olympics in Sochi, Russia. In addition, the ability of drones to connect to the internet directly helped journalists in broadcasting the event without any difficulty.

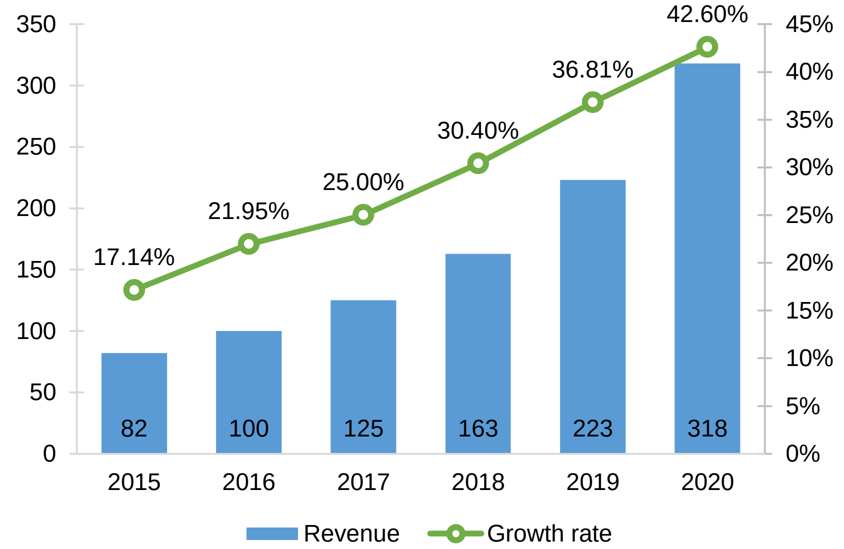
Drones are also used by channels like National Geographic to shoot wildlife documentaries.

Drones play a prominent role in the advertising and marketing of various products. They are used for on-spot marketing in shops and restaurants. Drones intercept the cellular network of a particular user and instantly send an ad related to the store the user is walking past. AdNear, a Singapore-based location marketing company, tested the technology by collecting information about people in order to deliver targeted ads in 2015. Commercial drones can also be used instead of helicopters to carry banners, as it is more economical. In 2015, the technology was used by Hungry Boys, a Russian agency to promote a Chinese restaurant that opened in Moscow. Multiple drones are being used for skywriting. For instance, to promote Star Trek Into Darkness in 2013, Paramount Pictures used commercial drones attached with LED lights to create the Star Trek Starfleet logo over London’s night sky. In 2015, Intel organized a light show, featuring 100 drones whose movements were synchronized with the music of a live orchestra. The show used Intel software, and it generated significant publicity by setting a Guinness World Record for the most drones simultaneously airborne.

Global commercial drone-enabled services market by surveillance

Many companies worldwide are expected to use drones for surveillance purposes during the forecast period, as regulatory hurdles related to their deployment have been addressed. Technological advances are helping vendors to provide drone-enabled surveillance and security systems. The use of lightweight batteries and automatic navigation helps in efficient surveillance as the drones can stay in the air for a longer duration and do not need to be manually controlled.

Exhibit 11: Global commercial drone-enabled services market by surveillance 2015-2020 ($ millions)



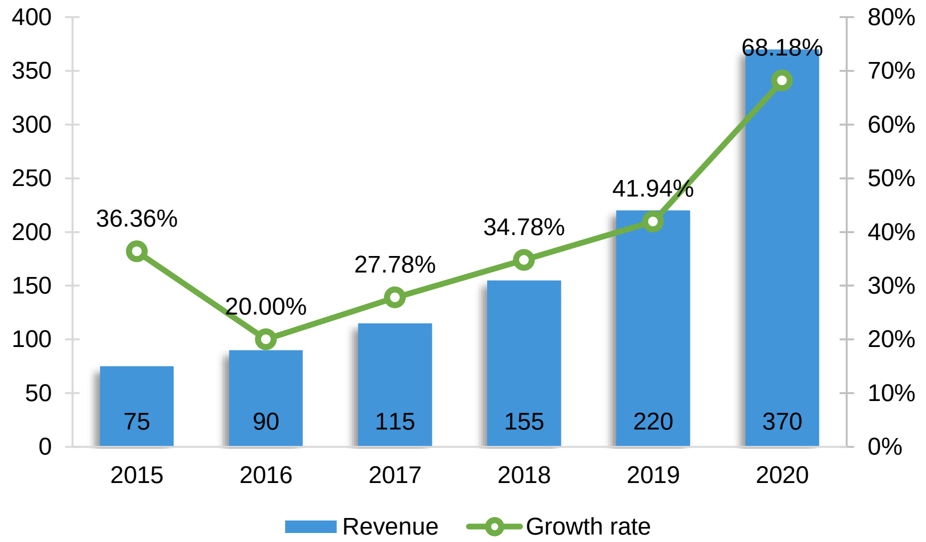
Source: Technavio

During the forecast period, the commercial drone-enabled services market by surveillance is expected to grow at a CAGR of 31.14% in terms of revenue. Organizations that are working on mega structure projects will show a high demand for such systems. Price drops are also making drones more affordable for organizations. A semi-autonomous drone with 4K video resolution and ultrasound-based navigation technology costs less than $1,300. Drones are expected to revolutionize the security industry with capabilities such as night-time surveillance, biometrics-based facial and behavior recognition, and motion sensing. Drone-enabled mass surveillance systems that can identify risky individuals and groups can be developed by integrating centralized identity databases. However, drone-based surveillance systems will not replace the existing systems but they will complement each other. The University of Alabama in Huntsville, US, announced that it will be using drones to assist campus

police in maintaining safety on the campus. In the US, the FAA has given at least 25 universities permission to fly drones. The FAA is allowing two UAVs to survey the Alaskan coast for commercial purposes. They will be used to monitor migrating whales and icebergs off the Alaskan coast and oil spills in the Beaufort Sea. The development comes as a major boost to the commercial drone-enabled services market in the US. In 2015, the country allowed the flying of drones only for experimental purposes.

Global commercial drone-enabled services market by weather forecast

Exhibit 12: Global commercial drone-enabled services market by weather forecast 2015-2020 ($ millions)

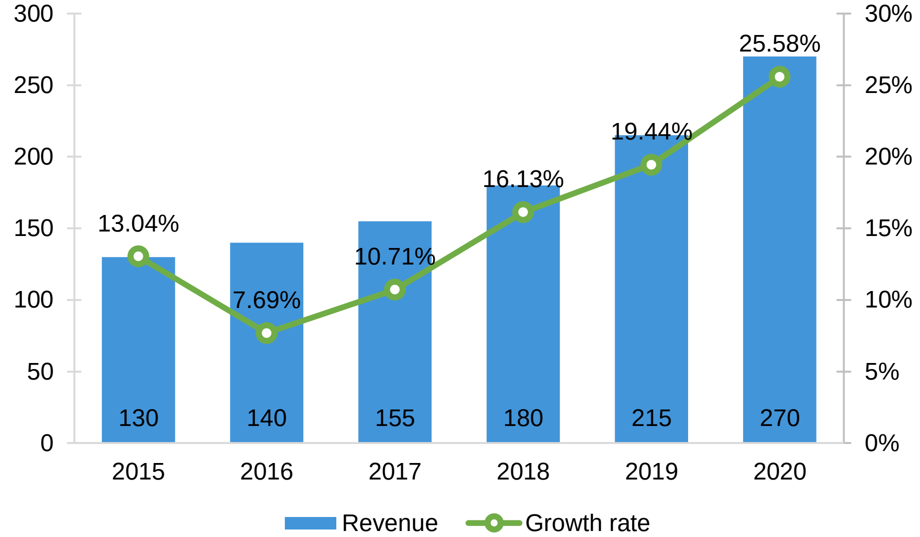


Source: Technavio

During the forecast period, the commercial drone-enabled services market by weather forecast is expected to grow at a CAGR of 37.6% in terms of revenue. Drones are used to understand and closely monitor natural calamities such as hurricanes and tornadoes. They also help geologists to get a better understanding of the trajectory of these disasters.

Global commercial drone-enabled services market by others

Exhibit 13: Global commercial drone-enabled services market by others 2015-2020 ($ millions)



Source: Technavio

The following are some of the other applications of commercial drone-enabled services:

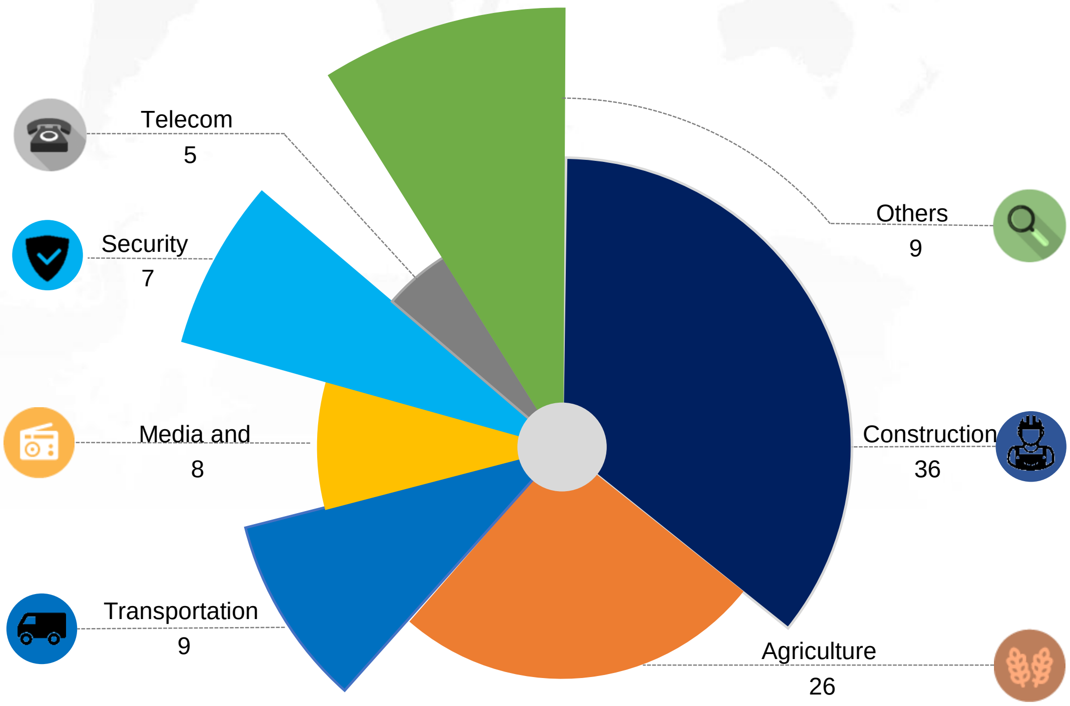
- Shooting private events
- Mapping
- Environmental monitoring
- Mining

PART 07:

Market segmentation by industry

Global commercial drone-enabled services market by industry

Exhibit 14: Global commercial drone-enabled services market by industry 2015 (% share)



Source: Technavio

Drones can be easily used for inspecting and providing public utilities with high-quality and real-time information on electricity supply lines, oil and gas pipelines, transmission towers, wind and turbines, bridges, and high-rise buildings. Regular aerial monitoring is beneficial for complex structures. The ability of the drones to make 3D models and take thermal readings helps in improving infrastructure inspection. Small drones that can get close help in providing contractors with detailed data to improve the project timeline and manage the workforce more efficiently

The use of drones is the highest in the agriculture industry after the construction industry. Farmers use drones for better monitoring of the fields as they help in improving the overall quality of the yield. Some drones are equipped with near-infrared sensors to help farmers detect the health of crops without physically visiting the crops. This will help farmers to improve the crops' health.

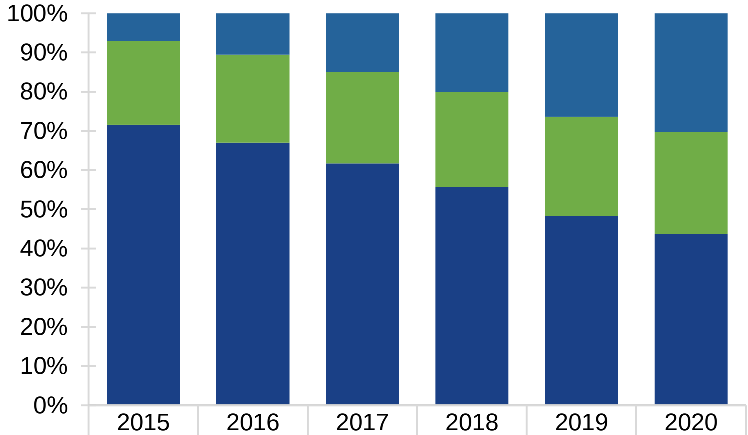
The application of drones in construction sites is relatively new. Drones help contractors to monitor the progress of the project for the entire project life cycle. Aerial photography is used for large projects. With the use of drone technology, construction engineers can closely monitor projects and compare plans to better coordinate material and labor on sites. They are also used to develop 3D models quickly and with precision. Drones are designed to access approachable locations such as eroded coastlines and mountaintops. They help in acquiring high-solution data that can be later used for 3D mapping and contouring of locations. The 3D maps generated are used for various purposes. For example, the OpenStreetMap uses the collected data to contribute to crowd-sourced mapping.

PART 08:

Geographical segmentation

Commercial drone-enabled services market by region

Exhibit 15: Commercial drone-enabled services market by region 2015-2020 (% share)



	2015	2016	2017	2018	2019	2020
APAC	7.07%	10.50%	14.95%	20.02%	26.41%	30.25%
EMEA	21.35%	22.52%	23.36%	24.23%	25.35%	26.13%
Americas	71.58%	66.98%	61.69%	55.75%	48.24%	43.62%

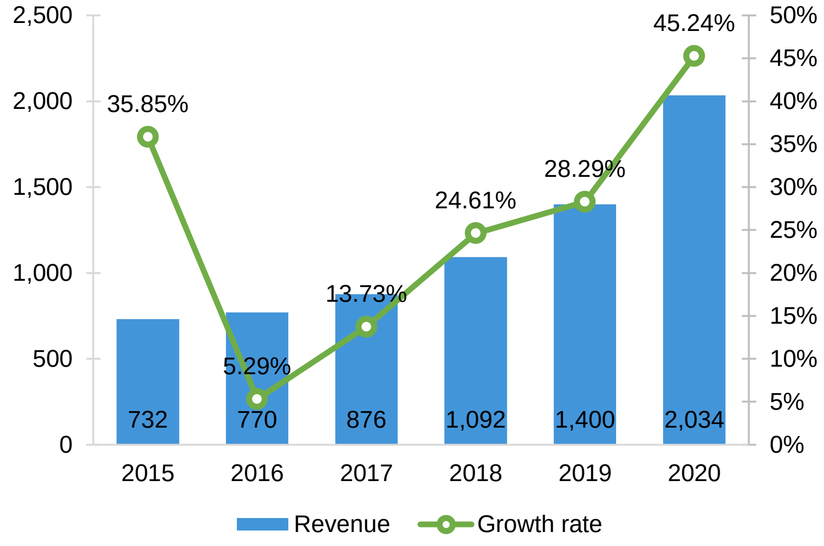
Source: Technavio

EMEA and countries in APAC such as China and Japan are expected to experience high growth during the forecast period, which is likely to have a significant impact on the market share of the Americas. The commercial drone-enabled services market in the Americas is quite mature. Commercial drone-enabled services are widely used by various industries such as media and entertainment and construction. In the media and entertainment industry, drones are used for shooting movies. Drones were used for shooting Marvel's Captain America: Civil War, which was released in 2015. Commercial drone-enabled services were used for shooting and taking aerial shots for the movie Wolf of Wall Street, which was released in 2014. In EMEA, drones are used in the field of journalism. Fox Sports has a separate drone-operating team that focuses on capturing footage of sports events. In APAC, the concept of drones is new. However, the market in the region is expected to grow at fast rate during the forecast period because of the increasing use of these services by vendors in various industries such as construction and agriculture. Commercial drone-enabled services help in reducing operational and monitoring costs.

Commercial drone-enabled services market in Americas

The commercial drone-enabled services market in the Americas is expected to grow at a CAGR of 22.68% during the forecast period.

Exhibit 16: Commercial drone-enabled services market in Americas 2015-2020 ($ millions)



Source: Technavio

China-based DJI and France-based Parrot are the major players in the commercial drone-enabled services market in the Americas. Commercial drone-enabled services have gained popularity because of their use for commercial purposes, especially in the construction and media and entertainment industries. Commercial drones are expected to replace helicopters and other manual delivery services in the market as they are more convenient and economical for users. As an increasing number of industries are readily adopting new technologies like drone technology, the market for commercial drone-enabled services in the region is expected to experience significant growth during the forecast period.

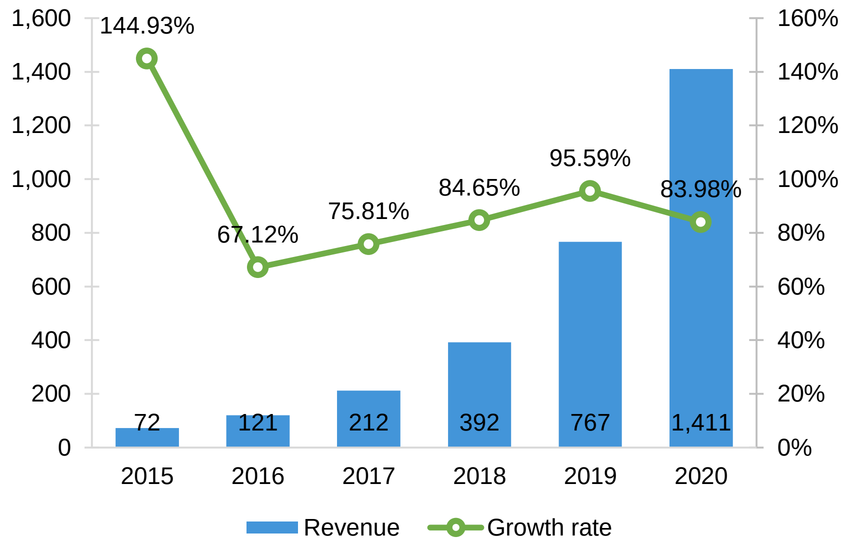
A major factor for the growing popularity of the commercial drone-enabled services market in the region is the booming telecom industry. In addition, the increasing interest of market players to use drones for surveillance and security purposes is driving the market growth. The high revenue generation and increased spending capability of market players, especially in the US, has led to the region being an early adopter of drones. A high percentage of the population can easily afford commercial drone-enabled services, and a large number of vendors have manufacturing houses based in the region. However, the use of drones for delivery purposes is likely to be

less owing to significant risks and security concerns such as invasion of privacy and the delivery of illegal products such as drugs by unmonitored drones. In the US, the FAA is mandating the registration of drones in order to track drones. It provides speed, weight, and height limits for the use of drones. The market is expected to experience significant growth by 2017, provided Amazon.com receives approval for the use of drones for delivery purposes.

Commercial drone-enabled services market in APAC

The commercial drone-enabled services market in APAC is expected to grow at a CAGR of 81.32% during the forecast period.

Exhibit 17: Commercial drone-enabled services market in APAC 2015-2020 ($ millions)



Source: Technavio

The market in APAC has been facing a slight difficulty in gaining momentum due to the lack of awareness about the advantages of commercial drone-enabled services among consumers. The pricing and manufacturing cost of equipment continue to be major concerns for developers in the region. DJI, a Chinese technology company, owns three factories in Shenzhen, China, which is an advantage for DJI in terms of production. However, the advantage is not long term as the competition in the market is increasing. The growing awareness among consumers will encourage more vendors to establish their manufacturing units in the country, thereby increasing the competition among vendors.

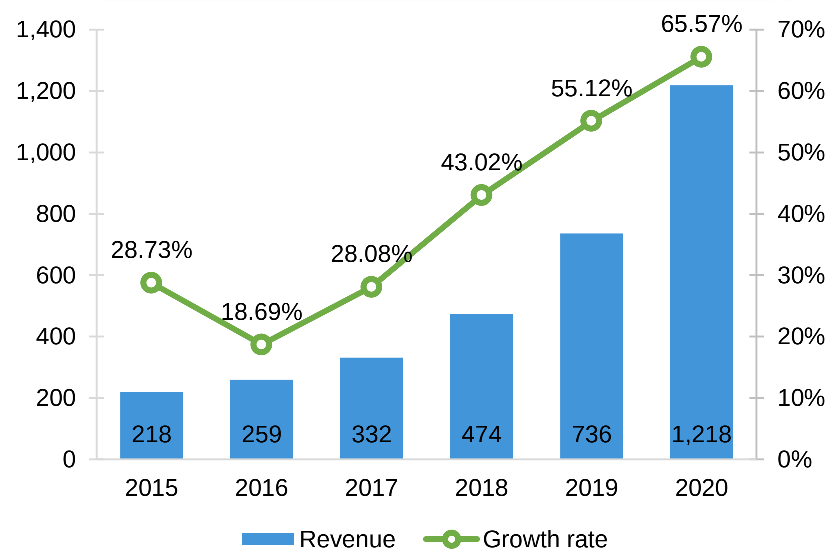
In addition, Parrot, a French drone manufacturing company, and other Chinese companies like Yuneec International and EHang have gradually started to threaten the

market share of DJI. The drones released by these two companies are increasingly used for commercial purposes. However, the high pricing of consumer drones is impacting the region's share in the commercial drone-enabled services market. In May 2016, Xiaomi, a Chinese electronics company, released Mi Drone at a price of $460, which was less than DJI’s basic Phantom 3 model.

Commercial drone-enabled services market in EMEA

The commercial drone-enabled services market in EMEA is expected to grow at a CAGR of 41.07% during the forecast period.

Exhibit 18: Commercial drone-enabled services market in EMEA 2015-2020 ($ millions)



Source: Technavio

The population in Europe is well equipped with technological gadgets. Europe has the highest rate of adoption of commercial drone-enabled services because of its growing popularity in the continent. The market will continue to grow during the forecast period with the increase in number of people adopting the services for shooting films and broadcasting news.

The adoption of drones in also increasing in places that have unfavorable conditions like snow and extreme climates. Parrot, a France-based company, has been operating in the segment in not only Europe but also in other parts of the world as it is one of the prominent vendors in the market. It is helping in increasing the overall revenue generated in the region. The economic instability as a result of the Eurozone crisis is a factor hindering the growth of the market, and it is expected to continue to affect the market during the forecast period.

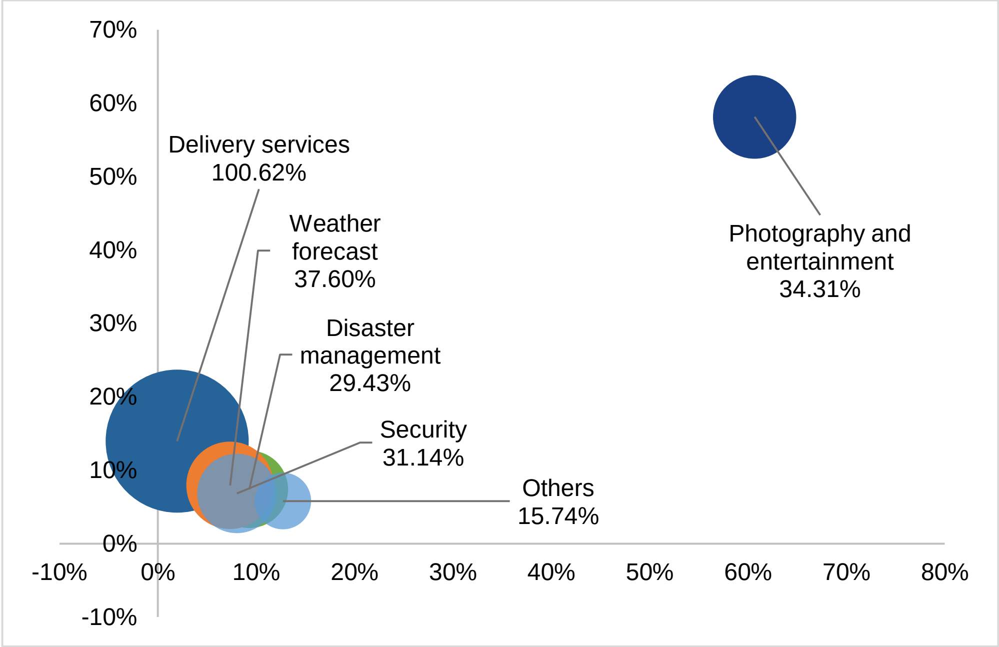
The Middle East is the smallest market for commercial drone-enabled services. The market is driven by the increase in number of biking tournaments. As the sport is popular in the region, the demand for a better viewing experience among users is increasing, thus creating a demand for commercial drone-enabled services. An increasing number of vendors, such as Sony, are entering the market in this region.

Market attractiveness by application

The absolute value of CAGR is considered for calculating attractiveness, which is represented by the size of the bubble in the graph. Commercial drone-enabled services in disaster management are likely to gain the lowest traction during the forecast period. One of the major reasons for the low CAGR is the frequency of use. Drones used in the media and entertainment industry are gradually gaining acceptance in the market because they are economical.

The use of commercial drone-enabled services for delivery services is likely to witness high market attraction during the forecast period, provided the governments of countries grant vendors the permission to use drones for delivery purposes. The use of commercial drone-enabled services will reduce the need for human labor to a great extent in e-commerce companies like Amazon.com.

Exhibit 19: Market attractiveness by application



Source: Technavio

X-axis: Market share in 2015 (%)

Y-axis: Market share in 2020 (%)

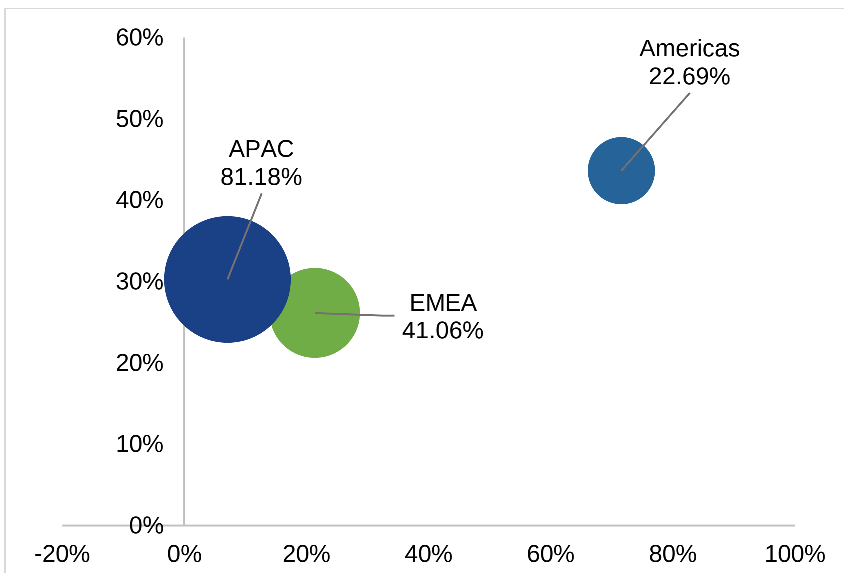
Bubble size: CAGR of application (%)

Market attractiveness by geography

The Americas will gain the lowest market attraction during the forecast period. The absolute value of CAGR is considered for calculating attractiveness, which is represented by the size of the bubble in the graph. As the market in the Americas is matured and has a large number of established large-sized enterprises, it is expected to have low growth during the forecast period.

EMEA and APAC are likely to witness moderately high market attraction during the forecast period. As a result of the growing number of internet users and increased acceptance of new technologies in these regions, the demand for commercial drone-enabled services is expected to grow. The services will also help to reduce the operational costs in various industries such as construction, transportation, and media and entertainment.

Exhibit 20: Market attractiveness by geography



Source: Technavio

X-axis: Market share in 2015 (%)

Y-axis: Market share in 2020 (%)

Bubble size: CAGR of region (%)

PART 10:
Buying Criteria

Exhibit 21: Buying criteria for commercial drone-enabled services

Source: Technavio

The impact of buying criteria on individual users is graded based on the intensity and duration of their influence on the market. Individual users make their buying decision based on the following parameters.

Cost

The cost of a drone is as a major criterion for users, as a large percentage of the population use drones for photography and entertainment.

Mobility

The navigation system of the drone should be flexible and user-friendly.

Internet syncing capability

Drones help in the easy and instant upload of news, videos, and photos.

Range

Drones are controlled either through mobile apps or through a flight controller that is usually connected via Wi-Fi or mobile data. Drone should be able to fly for long distances.

Camera resolution

Commercial drone-enabled services are used for filming movies and studying the pattern of natural disasters. Thus, the resolution and clarity of the camera is an important buying criterion.

PART 11:
Market drivers

Integration of commercial drones with VR technology

With technological advances, operational processes in several organizations are undergoing significant changes. Companies are increasingly focusing on developing a mobile workforce to function efficiently and to improve business operations. Various sectors such as infrastructure, tourism, agriculture, defense, oil and gas, and mining are investing heavily in workforce automation, which involves the integration of commercial drones with virtual reality (VR) and AR. With the use of such drones, companies aim to reduce human error. The integration of VR and AR into commercial drones offer different companies solutions for workforce automation. For instance, in the defense sector, drones are directly deployed to relay real-time information about enemy locations, blast sites, and directions. The information can be remotely accessed by military personnel using AR technology. The information is used to design and implement effective strategies, identify access routes, and monitor physically inaccessible locations for military operations.

In the infrastructure sector, AR drones are used instead of human inspection and survey systems. Drones can carry out inspections to ensure the safety of citizens. They protect users from falling materials, failure of structural components, and leakage of pipelines. In the agricultural sector, AR and VR drones are used by farmers to detect problems in crop health. Drones help in taking measures such as turning off water and supplying fertilizers to the crops without wasting much time on physical inspection. During the forecast period, the integration of commercial drones with AR and VR is expected to increase, which will support the market growth. The region-wise growth will depend on the extent of use of technology and services by industries. Countries such as the US are expected to adopt these devices mostly for infrastructure, industrial, and defense purposes.

High adoption of commercial drone-enabled services in industrial sector

The increased use of commercial drone-enabled services in the industrial sector is expected to drive the market during the forecast period. New areas such as warehouse management, servicing and maintenance, and training would benefit the most from the use of drones. The emergence of new devices such as tablets, smartphones, and other wearables integrated with drones has led to the development of apps for industrial maintenance. Drones can be used as a replacement of physical inspection in industries and play a major role in processes such as part analysis and simulation, staff support, and layout and construction planning or supervising. Inspection and

mapping are carried out by drones, and interpretation of analysis of the collected data is carried out using cameras installed on drones. This minimizes the risk of human error, reduces the time duration for physical inspection, and increases the productivity in industries.

Increase in adoption of multirotor drones

A multicopter with more than two rotors is known as a multirotor drone. Multirotor drones are increasingly becoming popular because they have the automatic flight option that enables users to use it for various purposes such as increasing the security around their premises and for automatic video recording during sports events or natural disasters. The ability of multirotor drones to fly in various directions helps users in efficient data collection. The presence of multiple rotors helps in better flight of the device. Even if one rotor fails, the drone can still stay in the air. Multiple rotors present on the drone help in maintaining stable flight and control. Multirotor drones are used for various applications such as agriculture. Its high efficiency, precision, and productivity; low-maintenance cost productivity; and technological advances are major factors that support the market growth.

Rise in demand for commercial drone-enabled services in transportation sector

The ability of commercial drones to hover over remote locations makes them suitable for use in the transportation and logistics sector. Drones can be used to ship urgently needed parts or supplies to remote locations that are not easily served by other modes of transportation such as ground transportation or manned aircraft. Commercial drone-enabled services are expected to be increasingly used by multinational companies such as Amazon.com in warehouses and distribution centers for the delivery of small packages within their facilities. The US government is focusing on providing guidelines for the use of commercial drones in urban areas. These guidelines permit users to fly drones up to a certain height, and also require drones to stay within a pilot's line of sight. The integration of commercial drones with various technologies such as real-time monitoring and dedicated drone flyers enable drones to monitor activities on a real-time basis. The use of commercial drone-enabled services in the transportation sector will further increase during the forecast period, thereby contributing to the growth of the market.

PART 12:

Impact of drivers

Exhibit 22: Impact of drivers

Drivers	Impact on key customer category
Integration of commercial drones with VR technology	Individual users: 4
High adoption of commercial drone-enabled services in industrial sector	Individual users: 4
Increase in adoption of multi-rotor drones	Individual users: 4
Rise in demand for commercial drone-enabled services in transportation sector	Individual users: 4

Source: Technavio

PART 13:

Market challenges

Stringent government regulations

The use of commercial drone-enabled services involves security risks, as they can be used in terror attacks, lead to aerial collisions, and be used to enter restricted areas. Thus, the governments of countries are formulating stringent regulations to secure airspaces. Some of the proposed regulations by the FAA for commercial-purpose drones in the US include:

- Drones must weigh under 55 lbs.
- The drone must fly during daylight hours and within the operator's visual line of sight.
- Drones must be registered and have aircraft markings.
- Operators must be at least 17 years old, pass an aeronautical knowledge test as well as a Transportation Security Administration background check, and hold an FAA UAS operator certificate.
- Drones are not allowed to fly above 18,000 feet. The flying of drones below 18,000 feet requires prior permission from the air traffic control.
- Operators must always see and avoid manned aircraft during flight. In the case of a collision risk, the drone operator must be the first to move away.
- The operator must discontinue flight if the drone can be a threat to aeroplanes, population, or the property.
- The weather conditions, airspace restrictions, and locations must be assessed before flying drones.
- The drone must not fly over people, except for those who are directly involved with the flight.
- The drone must operate below an altitude of 500 feet and its speed should not be above 100 miles per hour.
- Drones must be kept out of airport flight paths and restricted airspace areas. They must comply with FAA temporary flight restrictions.

Many countries have created similar rules as the US to restrict the large-scale application of drones in different sectors. The regulations are set to reduce the risks with regard to commercial jets being struck by drones either accidentally or in a planned attack. In the UK, civilian drones were spotted close to planes at heights of up to 5,000 feet.

Exhibit 23: Regulations for commercial-purpose drones in select countries 2015

Country	Weight (lbs)	Maximum altitude (feet)	Drones beyond line of sight	Airworthiness certification	Operator certification
US	<55	500	Visual line of sight (VLOS) is mandatory	Not mandatory	Requires a written knowledge test
Canada	<4 and <55	295	VLOS is mandatory	Not mandatory	<4 lb. drone, no certification is required
UK	<15 and <44	400	VLOS is mandatory	Not mandatory	Training is determined by a commercial operator
Denmark	<55	328	Spotter is mandatory	Not mandatory	Necessary training is required
Germany	<55	492	Allowed for state applications	Not mandatory	Not mandatory
France	<4, <9, and <55	492	Allowed with first-person view	Not mandatory	Mandatory
Australia	<4 and <330	400	Subject to rigorous risk assessment	Not mandatory	<4 lb. drone, no certification is required

Source: Technavio

The sale of commercial drones is likely to be affected during the forecast period because of stringent regulations that restrict the use of drones.

Connectivity issues with other electronic devices

Commercial drones require reliable high-speed internet connectivity to perform effectively. Though countries such as the US, the UK, and Japan have state-of-the-art wireless connectivity infrastructure, there are several countries that lack basic infrastructure. The OS of commercial drones needs to be compatible with the bandwidth to allow the seamless flow of data. As drones are often subject to movement in remote locations and locations that are physically inaccessible, connectivity issues are one of the major challenges faced by consumers. In addition, the integration of commercial drones with various technologies requires seamless connectivity to avoid inconsistencies in the flow of data. Low connectivity affects commercial drone services and hampers regular operations as data collection gets affected.

Drone hacking

Drone hacking is one of the major challenges faced by consumers. Drones can be wirelessly hijacked, manipulated, or stolen by hackers that want to gain access to highly sensitive information. The communication or GPS signals that guide drones can be jammed by denial-of-service attacks to prevent critical navigation and analysis tasks. Drones used by retailers to deliver goods can also be intercepted before they reach their destination. The growing concerns of drone hacking will prevent the wide adoption of commercial drone-enabled services during the forecast period.

Low awareness among general masses

The awareness and knowledge about commercial drone-enabled services is limited to a small customer base. The lack of awareness of commercial drone-enabled services is preventing potential customers from adopting these services for various applications, which is likely to hinder the growth of the market. Many industries are unable to use the commercial drones to their maximum potential. Moreover, industries are waiting for commercial drones to reach maturity so that there would be lower risks associated with the adoption of the drone technology. The lack of infrastructure to support the use of drones is one of the main factors for the low penetration rate of drones in developing countries. Commercial drone-enabled services are more popular in developed nations such as the US than in developing nations such as India.

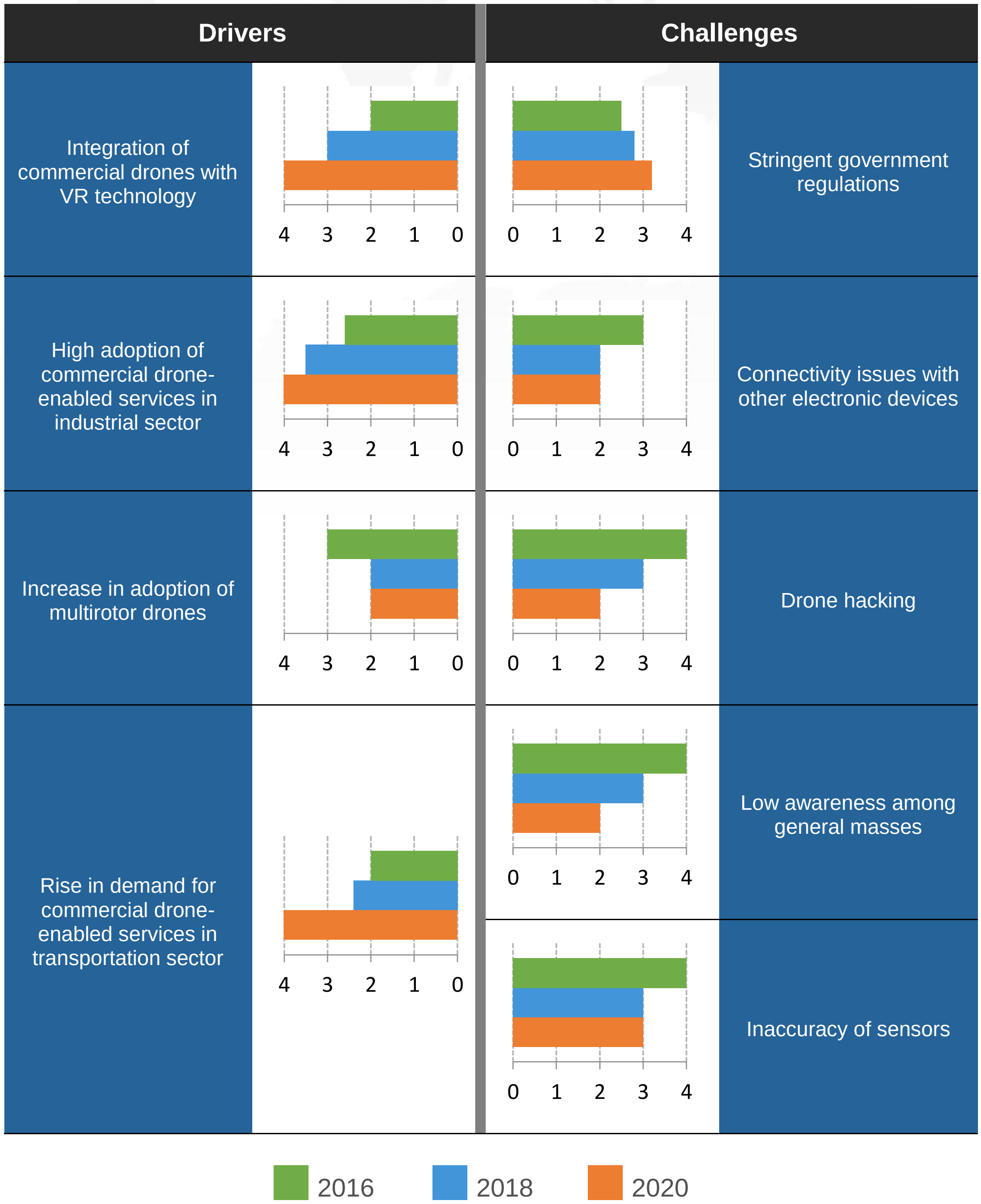
Inaccuracy of sensors

Miscommunication can occur between controllers and drones. Faulty sensors can result in instances of miscommunication during the use of drones for various applications. As drones are used in remote locations, the sensors installed in drones are subject to inaccuracies because of movement and other interruptions. This can result in an operation failure and unfavorable outcomes. In addition, not all drones come with high-quality sensors. Several low-budget drones are fitted with inefficient sensors, which can hamper the integration of mobile apps with drones. This is a major technological challenge for the market.

PART 14:

Impact of drivers and challenges

Exhibit 24: Impact of drivers and challenges



Source: Technavio

PART 15:

Market trends

Emergence of drone racing as major sport event

The use of consumer drones for sports is increasing with its growing popularity. Mountain Dew, a carbonated soft drink brand produced and owned by PepsiCo, and DR1 Racing organized a drone race in August 2016. The event used 12 of the world's top drone-racing pilots. They controlled the drones from the top of the dam and maneuvered them around a large number of obstacles while flying them at speeds of more than 75 miles per hour. The race included various heats, qualifiers, and finals over the course of two days. The race was sponsored by Mountain Dew and was broadcasted globally through international sports networks like ESPN and the International Drone Racing Association. They broadcasted the event live on cable TV. A one-hour broadcast aired on Discovery Communication's Discovery and Science channels. With drone racing gaining more popularity, the market is expected to experience significant growth during the forecast period.

Shift in demand to developing nations

The demand for commercial drone-enabled services is rapidly shifting from developed nations to developing countries. The primary reason for the shift is the growing popularity of adventure tourism and sports in developing nations. Moreover, the reach of the commercial drone-enabled services market is very low in emerging countries such as India and China, which is resulting in a demand from first-time buyers. The main factors driving sales in developing nations are increased disposable income, use of social networking sites, and growing interest in photography and entertainment.

Furthermore, many Chinese companies are entering the market. CES is a platform where companies showcase their new products and innovations. The recent CES, which happened in January 2016, saw many new Chinese drone companies. Some of them are ProDrone, Autel Robotics, Hexo, and 9 Eagles AEE. The entry of these companies will increase the competition in the market and will bring down the average selling price of drones. Vendors will adopt innovative technologies to differentiate themselves from other players in the market and to gain a larger market share.

Growing popularity of camera drones

Camera drones are becoming popular among users as they help customers to socialize better and also provide flexible visualization while sharing videos and photos on social networking websites. As camera drones are equipped with smart cameras and can be easily connected to the internet, the uploading of photos and videos becomes easy. Camera drones are equipped with smart sensors and software that

enable automated responses to inputs made by the camera, making the collection and syncing of the data easier for the user. They can be connected to each other, allowing users to take single shots from multiple angles. They offer users with specialized videos and high-quality photos. The increasing popularity of camera drones has encouraged vendors to increase their investments in the manufacture of camera drones. For example, DJI sanctioned $1 billion for the development and enhancement of drones, including camera drones.

Rise in demand for high-quality imaging and accurate sensors

The commercial drone-enabled services market is witnessing a rise in demand for high-quality photos and videos. Industries using commercial drone-enabled services are demanding for better image and video resolution to increase data accuracy and quality of inspection. Owing to this rise in demand, companies such as DJI and Yuneec International are offering integrated 4K video-recording cameras and HD video monitoring systems with commercial drones at affordable prices. The use of high-resolution imaging improves the performance of drone services. However, the demand for high-quality imaging in the defense and aerospace sectors is sluggish compared with the demand in sectors such as infrastructure and oil and gas.

The demand for high-accuracy sensors in commercial drones is increasing with the rise in demand for high-quality imaging. To achieve increased performance and to overcome the challenge associated with inaccurate sensors, commercial drone manufacturers are employing smaller, lightweight, and accurate sensors such as stereoscopic, LiDAR, ultrasonic, spectral, and infrared sensors for commercial drones. These sensors will help commercial drones to perform tasks such as improved crop vigor analysis for the agricultural sector, collision avoidance, 3D imaging, and infrared thermography.

High adoption of drones for advertisements

Many advertising agencies are encouraged to adopt drones because of their growing popularity. Companies are focusing on manufacturing drones that are capable of carrying the weight of billboards. Drones are also used to drop off promotional products such as t-shirts. Dronecast, a US-based advertising agency, uses drones with banners hung from them to promote products manufactured by other companies. It also uses commercial drones to hang speakers and play music or for promotional messages.

The Coca-Cola Company teamed up with the non-profit organization Singapore Kindness Movement to deliver care packages via drones to Singapore's neglected

migrant construction workers. The care packages consisted of photos of Singapore citizens holding signs thanking laborers for building their city. It also contained cans of Coca-Cola.

In 2013, Paramount Pictures used a group of drones to promote its film Star Trek Into Darkness. The commercial drone that was attached with LED lights flew over the River Thames in London creating the Star Trek Starfleet logo in the sky. In Russia, a noodle shop chain used drones to advertise the shop's lunch specials to workers. The promotion is claimed to have increased the shop's sales by 40%.

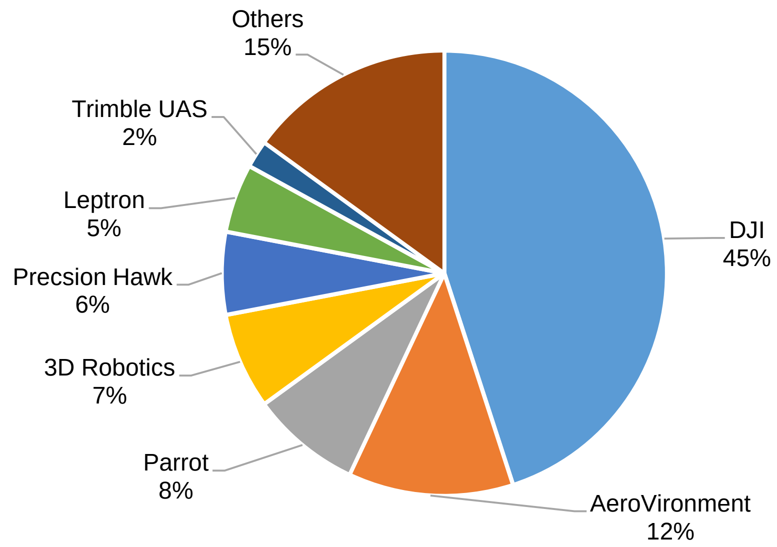
PART 16:
Vendor landscape

Competitive scenario

The global commercial drone-enabled services market is one of the fastest-growing markets and is highly competitive, with the presence of several vendors. Intense competition, rapid technological advances, and frequent changes in consumer preferences present significant risks for vendors. To survive and succeed in this extremely competitive environment, it becomes imperative for vendors to distinguish their product and service offerings through clear and unique value propositions. Vendors offer a variety of benefits such as innovative product features, low-cost products, a guarantee of high-quality images, and the easy availability of products. To sustain in the competitive market, vendors have to develop new ideas and technologies and stay up-to-date with the emerging technologies. DJI is the largest company that is operating in the segment with revenues nearly six times than the current market cap.

Market share analysis

Exhibit 25: Global commercial drone-enabled services market 2015 (% share)



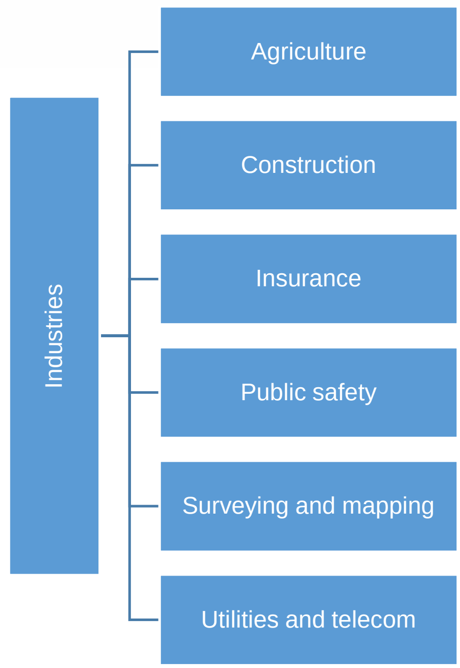
Source: Technavio

Key vendors

3D Robotics

3D Robotics is a leading designer and manufacturer of commercial and recreational UAVs. The company is one of the renowned manufacturers of commercial drones, fixed-wing UAVs based on the ArduPilot platform, and ready-to-fly quadcopters for aerial photography and mapping. The company's products find applications in various industries that include construction, insurance, mapping, agriculture, telecom, and public safety. 3D Robotics is also a founding member of Dronecode, which is an open-source UAV platform. The company also develops flight controllers that help in controlling and stabilizing multirotor drones.

Exhibit 26: 3D Robotics: Industries



Source: Technavio

Product portfolio

Exhibit 27: 3D Robotics: Product portfolio

Key products	Description
Solo	It is labeled as the world's first smart drone. It is largely used for aerial photography and videography.
Site Scan	It is the company's aerial analytics platform that collects actionable data, minimizes costs, and helps

Key products	Description
	the company's clients make smarter business decisions through efficient monitoring.
Enterprise	The package, when coupled with the Site Scan app and the 3DR cloud, helps in instant collection, processing, and analysis of data via Autodesk tools.

Source: Technavio

Recent developments

- April 2016: The company announced that Solo smart drone will support a suite of advanced software that will make Solo more powerful, safer, and overall a more versatile drone.
- April 2015: The company raised $14 million in addition to the $50-million offering received in 2015. The additional funding was by WestSummit Capital, SanDisk Ventures, and Atlantic Bridge Ventures.
- February 2015: The company raised $50 million led by Qualcomm Ventures, True Ventures, OATV, Mayfield, and Shea Ventures.

AeroVironment

AeroVironment offers small unmanned aircraft systems (UAS). The company offers commercial UAS solutions that includes Qube, Raven, Wasp AE, and Puma AE. The company's solutions are used for applications in the agricultural segment. They are used to monitor crops for ripeness; inspect crops for diseases, harmful insects, and nutritional deficiencies; and pesticide distribution. The company is focusing on developing safe, innovate, and reliable new solutions during the forecast period.

Recent developments

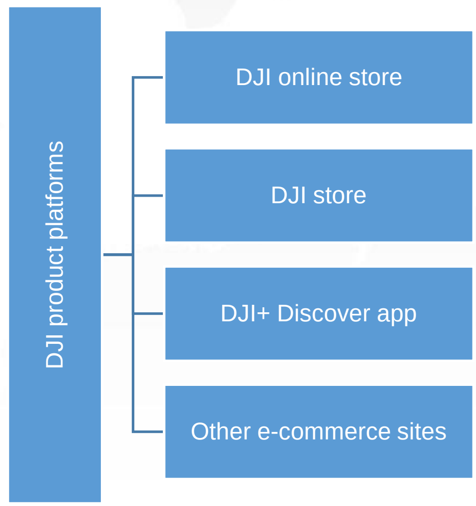
- October 2015: The company received an order from United States Marine Corps for the supply of Puma AE small UAS. The contract was worth $13 million.
- June 2014: The company launched the first FAA-approved UAS that provides GIS services.

DJI

DJI, Dà-Jiāng Innovations Science and Technology, is a developer and manufacturer of camera-based commercial drones and its hardware peripherals. The product lines cover high-end UAV flight control systems and ground control systems, professional aerial photography drone platforms, commercial Gimbal systems, intelligent model

aircraft products, and the high-precision control module. Its key product line includes a Phantom line of camera-based quadcopters.

Exhibit 28: DJI: Product platforms



Source: Technavio

Recent developments

- August 2016: Opens its first drone arena in South Korea
- August 2016: Sets no-fly zones for its drones at sports arenas in Brazil Temporary Flight Restrictions to help improve safety and security
- August 2016: Launches the Elevate Yourself contest along with SkyPixel
- August 2016: Launches Osmo+ Integrated Zoom Lens to Handheld Gimbal Camera
- July 2016: Collaborates with uAvionix to release the ADS-B collision avoidance developer kit
- July 2016: Announces the Takyon Z4 Mini ESC series for drone racers
- July 2016: Introduces the first integrated aerial zoom camera

Leptron

Leptron focuses on designing, manufacturing, and distributing drones in the military, surveillance, agriculture, and mining sectors. The drones are technologically advanced and easy to operate. The company focuses on creating and developing innovative drones that can carry larger loads, have a longer range, and can reach higher altitudes. The drones are also capable of withstanding harsh environmental conditions. The company has a patented technology that specializes in developing user-friendly

and easy-to-operate drones. Furthermore, the drones help in the easy collection and analysis of data for use in industries such as infrastructure and military.

In 2015, Lean Tech Manufacturing, a subsidiary of Geotech Environmental Equipment, announced its acquisition of Leptron Industrial Robotic Helicopters along with their drone manufacturing systems, including the patented RDASS and patent-pending Avenger.

Recent developments

- March 2015: Acquires Leptron Industrial Robotic Helicopters along with their drone manufacturing systems, including the patented RDASS and patent-pending Avenger
- February 2015: Acquires AquaVISION Environmental and the Colloidal Borescope product line, which was developed by scientists to accurately estimate the velocity of groundwater

Parrot

Parrot is a French manufacturer of wireless products. The company designs, develops, and markets UAVs that connect with smartphones or tablets, and AR/VR headsets. The company is currently focused on automotive, civil drones, and connected objects. Parrot is expanding on the UAV market with the Parrot AR Drone, a quadcopter piloted via Wi-Fi and using augmented reality, thereby developing new solutions to address the UAV market for professional use. The company manufactures a wide array of drones and is listed on NYSE Euronext Paris since 2006. The company was a market leader in automotive infotainment before it ventured into mobile application platforms. Parrot invested in MicaSense, a software provider, to collect data on agriculture crops. It also invested in Airinov in 2014, which is a provider of UAV farming applications and sensors.

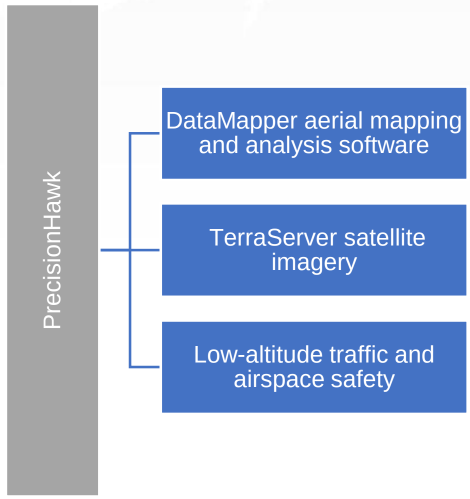
Recent developments

- November 2015: Neurala releases Selfie Drone app for Parrot Bebop 1 & 2
- September 2015: Introduces SmartGlass for AR experience with the help of Parrot drones
- September 2015: Launches Parrot Zik 3, wireless headphones

PrecisionHawk

PrecisionHawk manufactures and sells UAS that collect and process data. Its offerings include in-flight diagnostic/monitoring and artificial intelligence solutions. Its products are used in the agriculture, environment and climate, and infrastructure sectors. One of the prominent products of the company is a commercial drone called Lancaster. It is an autonomous and fixed-wing drone designed specially to gather high-quality data with the help of sensors.

Exhibit 29: PrecisionHawk: Business segments



Source: Technavio

Recent developments

- November 2015: Enters into a partnership with Indiana State University for the research of drone safety technologies and aerial data applications
- March 2015: Enters into a partnership with Genera Energy to build aerial analysis tools for biomass crops

Trimble UAS

Trimble UAS, formerly known as Gatewing, offers UAS such as UX5 HP UX5, and ZX5. They are used in the construction, agriculture, mining, disaster relief, conservation, engineering, and forestry sectors. The company launched its first commercial drone Gatewing X100 in 2010. It was designed mainly for terrain mapping and surveying. Trimble Navigation acquired Gatewing in 2012. It started manufacturing drones for various industries such as construction and agriculture. In 2013, the company manufactured Trimble UX5, which was designed specifically for aerial imaging.

Recent development

- August 2015: Releases multirotor package to expand commercial UAV fleet

Other prominent vendors

Exhibit 30: Other prominent vendors

Company	Description
Airdog	It offers an airborne drone with a GoPro camera that tracks the locations of users, follows them, and captures videos. The Android and iOS app enable the drone to operate in various modes that include auto-follow, relative position follows, follow the track, look down, circle, and hover and aim. In August 2015, the company launched AirDog, an auto-following camera drone.
Airware	It provides development platforms for custom configuration UAS. It provides os-Series Autopilot platforms for UAS development and internet protocol creation. It also provides custom solutions for various UAV applications. It serves the agriculture, government, telecom, utilities, and mining sectors. In May 2015, the company launched the commercial drone fund for developing technologies that are used in commercial applications.
Alibaba.com	In February 2015, Alibaba started drone delivery trials in China. The company is focusing on increasing its customer base to reach two billion customers by 2025. Alibaba is focusing on the innovate delivery of goods to its customers with the help of the Taobao drone.
Amazon.com	The company will likely be using Prime Air drone to deliver goods. It is designed to deliver goods to customers in 30 or less than 30 minutes. It has Prime Air development centers in the US, the UK, and Israel. The drone flies under 400 feet and weighs less than 55 lbs. In December 2015, the company released Prime Air delivery drones.
Delair-Tech	It designs and manufactures UAS solutions for aerial observation in the agricultural and industrial sectors. Its offerings include UAV systems, drones, payloads, airframes, and ground control stations. The company products are used in precision

Company	Description
	farming, environmental survey campaigns, and industrial infrastructure applications. Some of the partners of the company include ISAE, INRA, Arvalis, Cetiom, and Airbus. In December 2015, the company collaborated with IGN for the COP21 Climate Conference. In October 2015, the company collaborated with MicaSense to serve the precision agriculture market.
Delta Drone	It designs and manufactures commercial and consumer drones. Its product offerings include Delta H, Delta Y, payloads, and ground equipment. It serves the agriculture, mining and quarrying, and industrial inspection industries. In September 2015, the company entered into a partnership with Fly-n-Sense that offers civilian drones. Under this partnership, Delta Drone holds 90% of the capital of Fly-N-Sense.
DHL Express	The company launched parcelcopter for initial research operational purposes. The company uses parcelcopter to deliver small parcels that include medication and other goods.
DroneDeploy	It offers cloud-based software solutions for commercial drone operations. The company's solutions provide automated flight safety checks, real-time mapping, workflows, and data processing solutions. It provides solutions to the agriculture, mining, real estate, and construction sectors. In November 2015, the company announced one million acres of drone data and also launched free map processing.
ECA Group	It offers UAV products that include mini UAV for civil protection, mini UAV for inspection, mini UAV for ISTAR, mini UAV for survey, IT180-3TET, and mini UAV for surveillance.
Facebook	In August 2015, the company unveiled drones for beaming internet access from the sky. The drone was built in 14 months, and it flies for 90 days. The company is focusing on developing hundreds of drones that circle large areas at an altitude of 60,000 feet.

Company	Description
Freeport-McMoRan	Freeport-McMoRan, often called Freeport, is a mining company based in the Freeport-McMoRan Center in downtown Phoenix, Arizona, US. The company uses drone-enabled services to monitor the progress on the mining sites.
Google	It is developing a drone called Project Wing. The company is focusing on commercializing the delivery of goods using a drone in 2017.
GoPro	It offers cameras for drones. It offers GoPro Hero 3 / 3+ / 4 cameras for the DJI Phantom 2 drone, 3DR Solo drone, 3DR IRIS+, and Walkera QR X350.
Hexo+	It offers a self-flying camera that captures and shares aerial images directly from the Hexo companion app. The company is currently collecting funds using crowdfunding strategies. In November 2015, the company announced that it shipped Hexo+ drone to the US market.
Hoovy	It provides an advertising marketing platform that uses drones to increase brand awareness. The company uses the Advatar drone, a GPS-equipped octocopter drone, that can access various locations. Hoovy fly's advertisements in different locations that include parks, beaches, college campuses, streets, and freeways. Some of the clients of the company include Yahoo Finance, NBC, MarketWatch, and CNBC. In June 2015, the company launched a fundraising campaign on the IndieGoGo crowdfunding platform.
Microdrones	It provides UVA solutions for mapping, aerial inspection tasks, unmanned cargo, and aerial video and photography. Its offerings include md4-200, md4-1000, and md4-3000. Its products are used for applications such as search and rescue, inspection, monitoring, and security. In September 2015, the company announced that State Grid Corporation of China is using the md4-1000 system for construction and operation of a power grid.
Oceaneering International	The company develops and manufactures drones and other solutions for the marine, environmental, and space industries.

Company	Description
Redbird	The company is involved in the development of cloud-based processing and analysis solutions from aerial data that is collected by drones. It provides innovative solutions that are designed for precision farming. It is also provides solutions for quarry face and stockpile monitoring, inspection of civil engineering constructions, infrastructure monitoring, and agricultural research. The drones offered by the company include quadrotors, flying wings, and planes. In April 2015, the company announced that ENGIE, a French energy company, is investing in drones.
SURVEY Copter	It designs and produces UAV airplanes, VTOL UAVs, fixed-wing UAVs, and control and data transmission systems. Its products are used in the applications of humanitarian missions, environmental missions, earthquakes, avalanches, and meteorological missions. It operates as a subsidiary of Airbus.
VDOS Global	It provides systems, personnel, software, and data to its clients. It offers inspection services that include hazardous area inspection, post-storm surveys, flare tip inspection, and emergency inspections. It also offers aerial photo survey services that include landslide detection, land use management, and terrain imaging. In October 2015, the company entered into a partnership agreement with Cunningham Lindsey for drone-supported insurance claims.

Source: Technavio

PART 17:

Appendix

List of abbreviations

APAC	Asia-Pacific
AR	augmented reality
EMEA	Europe, the Middle East, and Africa
LiDAR	light detection and ranging
UAS	unmanned aircraft system
VLOS	visual line of sight
VR	virtual reality

PART 18:

Explore Technavio

Our team of 200 specialized market research analysts continuously monitor and evaluate the global market landscape. Enterprises of all sizes, including many Fortune 500 companies, rely on our comprehensive coverage, extensive research, and actionable market insights. From emerging technologies to emerging markets, our research reports provide clarity and guidance on current and future market scenarios.

Ask an analyst

Our analysts are available to speak with you and answer your questions. You can easily book an appointment with one online.

Provide your feedback

We welcome your thoughts and comments on this report. Your feedback helps us continually improve to better meet your needs.

Want more like this?

If you are looking for more information, or related information, take a look at other reports we have available.

Upgrade your license

We have three types of licenses to suit your needs.

Enterprise

Everyone in your organization can access the report.

Enjoy the benefits and save over 60% when you subscribe

Global

Everyone in your organization can access the report and use up to 15% of its contents for promotional or publishing purposes.

Contact a sales representative

Subscription

Get the most value for your research dollar with our subscription service and save over 60% off individual reports.

Show me a demo of your subscription platform

Visit our blog

Read about research in progress and reports to be published — and join in the discussion!

Follow us on Twitter

Receive the latest news and highlights from Technavio on industries and markets we cover.

Find us on LinkedIn

Learn more about our company, our culture, our people and the products and services we provide.

Disclaimer