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Global Unmanned Aerial Vehicle Market Assessment, By Wing Type [Fixed Wing, Rotary Wing, Others], By Class [Micro/Mini UAVs, Tactical UAVs, Strategic UAVs, Others], By Application [Commercial, Defense, Civil, Others], By Mode of Operation [Remotely Operated, Semi-Autonomous, Fully Autonomous], By Maximum Take Off Weight [Less than 15 Kg, 15 to 50 Kg, More than 50 Kg], By Region, Opportunities and Forecast, 2018-2030F

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Abstracts

Global unmanned aerial vehicles market size was valued at USD 24.50 billion in 2022, which is expected to reach USD 62.64 billion in 2030, with a CAGR of 12.45% for the forecast period between 2023 and 2030. The fascination with vertical travel has been an enduring aspect of human interest. Advancements in technology have enabled expert air travel, and subsequent developments in unmanned aerial vehicles have granted humans the flexibility to navigate for various purposes. Unmanned Aerial Vehicles, as the name implies, are aircraft designed to travel and explore the skies without onboard human pilots or passengers. These UAVs can operate autonomously to varying degrees and are typically under remote control by a human operator. Their applications include logistics, surveillance, rapid emergency response, aerial photography, wildlife monitoring, agricultural assessment, and expand to military applications.

Initially, UAVs were primarily developed for military applications to reduce risks to pilots during combat missions. Nevertheless, technological advancements such as lightweight materials, improved long-distance communication systems, and enhanced battery technology, leading to extended flight durations, have made UAVs increasingly cost-

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effective for various tasks like data collection, monitoring, and inspections. Currently, it provides compelling alternatives to traditional methods. However, the expanding utilization of drones in the corporate sector faces regulatory challenges. Yet, ongoing progress in drone technology and industry-specific software promises improved operational efficiency. As drones become more autonomous, coupled with simplified licensing and registration processes, the costs associated with drone adoption are expected to decrease, fostering their utilization across diverse industries, and propelling the global UAV market.

Military Requirements Propel Combat UAVs Market

Combat UAVs are popular due to their adaptability for intelligence, surveillance, reconnaissance, and precision strikes employing missiles and bombs. Over 100 countries deployed these remotely operated aircraft for missions that eliminate the risk to human lives. Their swift deployment addresses emerging threats, carrying a range of payloads, including sensors and missiles. These UAVs boast advanced surveillance capabilities, capturing real-time high-resolution data crucial for military intelligence. Ensuring precision strikes significantly reduces collateral damage compared to manned aircraft, while offering cost-effective operation and maintenance. Some models are known for their extended endurance, facilitating prolonged surveillance missions. The widespread adoption underscores their immense potential in modern warfare, emphasizing their pivotal role on the battlefield.

In March 2023, the United States Air Force's Air Combat Command, having relied on the MQ-9A Reaper drone for over 14 years, which was sufficiently impressed by General Atomics Aeronautical Systems to award them a contract for three of their latest MQ-9B SkyGuardian remotely piloted aircraft systems (RPAS). This marked the United States military's first order for the SkyGuardian. The MQ-9B is envisioned to provide air support, surveillance, targeting, and effects in various air environments. Recent tests have confirmed its operational capabilities, including cold-weather validation and low-earth orbit satellite control.

Increasing Commercial Applications

The commercial sector widely deploys a diverse fleet of small, micro, and mini drones, which, when equipped with various sensors, electronics, and software systems, serve a multitude of purposes. For instance, commercial drones excel in photography and videography, featuring state-of-the-art cameras such as the DJI Mavic 2 Pro and the DJI Mavic 3 with extended battery life and an updated O3+ transmission system, allowing

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for flights up to 15km away. Enterprises harness UAVs for specialized tasks like mapping and surveillance, enhancing them with technology like LiDAR sensors. These sensors are indispensable tools for creating highly detailed 3D models applicable in various industries, from surveying forests to assessing car accidents and mapping eroded shorelines. Mapping drones are essential for geospatial professionals who conduct aerial surveys for large-scale projects. As the range of commercial applications grows, the UAV market continues to prosper.

In August 2023, JOUAV showcased its CW-15 VTOL drone and VTOL hangar system at the 2023 Intelligent Mining & Coal Mining Technology Conference. The drone solution integrates various UAVs with a mobile ground data collection system, enhancing 3D data collection for mining and coal production management. JOUAV presented intelligent inspection and mapping technologies innovations, improving mining facility assessments and resource management. Thus, displaying the extending reach of UAV technology across domains.

Governments Regulations

Governments are responsible for ensuring citizens' safety and supporting private enterprise growth, particularly in the rapidly evolving Unmanned Aerial Vehicles (UAVs) field. Regulations are crucial in ensuring safe drone operation, minimizing accidents and collisions, and mitigating security threats. They manage shared airspace, allowing safe coexistence of commercial aviation and recreational drone operators. Regulations address privacy and data protection concerns, imposing restrictions on surveillance and data collection practices. Well-defined regulations provide a clear framework for businesses and investors, promoting growth and innovation in the UAV industry.

In North America, the United States government’s 2023 budget request for Defense Department stood at USD 773 billion. This budget represents a USD 30.7 billion or 4.1 percent increase over the 2022 enacted base level of USD 742.3 billion and an 8.1 percent increase from the 2022 requested level. Notably, out of this, the government has allocated budget of USD 2.4 billion in 2023 exclusively for replacement or repair of unmanned aerial vehicles, helicopters, tactical vehicles, and various combat support equipment.

AI and Machine Learning Enhancements Revolutionize UAV Autonomy and Intelligence

Artificial Intelligence and Machine Learning advancements have significantly improved the autonomy and intelligence of Unmanned Aerial Vehicles (UAVs), enabling real-time

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decision-making, improved obstacle detection, and adaptive weather responses. These technologies are crucial for surveillance, reconnaissance, and disaster management, enabling simultaneous object identification, selection, and tracking. AI-driven UAV swarming ensures synchronized mission execution, and their applications span across sectors like agriculture, environmental monitoring, and security, fostering growth and innovation in the UAV industry.

In April 2023, Israel Aerospace Industries Ltd and Windward Ltd entered into a collaborative agreement to equip its heron UAV with advanced autonomy and Artificial Intelligence (AI) capabilities systems. This integrated capability will leverage Windward's AI technology in conjunction with the Heron system. The partnership aims to empower users with the capacity to enrich open-source maritime data with AI-driven insights, enabling the rapid detection of anomalies in vessel behavior and patterns of life, as well as risk assessment. The collaboration facilitates more efficient target identification and reduces the personnel and assets required for these tasks, optimizing maritime operations.

Impact of COVID-19

The COVID-19 pandemic had a profound impact on the global unmanned aerial vehicle (UAV) market in 2020 and 2021, reshaping dynamics in production, supply, and demand. The pandemic led to disruptions in manufacturing and supply chains worldwide, affecting UAV production. One significant challenge was the semiconductor chip shortage, which hampered the production of various electronic components crucial for UAVs. This shortage had a cascading effect, causing delays and increased costs for UAV manufacturers. The impact was felt globally, with certain regions facing more severe disruptions due to their dependence on specific suppliers or manufacturing hubs. Despite these challenges, the demand for UAVs surged during the pandemic. Governments, industries, and organizations turned to UAVs for various applications, including surveillance, monitoring, and delivery services. The need for contactless and remote solutions increased the adoption of UAVs, particularly in sectors such as healthcare, agriculture, and logistics. The demand for specific types of UAVs, such as delivery drones and surveillance drones, saw a significant uptick during this period. Industries like healthcare utilized UAVs for medical supply delivery and monitoring compliance with safety protocols. For instance, in 2021, Zipline, a prominent drone delivery company, played a pivotal role in deploying its autonomous drones to transport light-weight medical supplies in Rwanda and Ghana. In Ghana, Zipline collaborated with Pfizer, the Health Ministry, UPS, and other partners to establish a robust drone delivery infrastructure, facilitating the distribution of over 2.6 million COVID-19 vaccine doses by

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June 2021. The company aimed to deliver an additional 2.4 million doses, particularly focusing on remote areas. In Rwanda, Zipline focused on delivering blood, medical supplies, and personal protective equipment.

Impact of Russia-Ukraine War

The Russia-Ukraine War in 2022 marked a significant shift in geopolitical dynamics, transforming the traditional war into a modern, digital-age battle marked by the extensive use of drones. Both sides employed reconnaissance and attack drones in every phase of the conflict, contributing to a new era in military tactics. Ukraine embraced a diverse range of drones, including commercial ones like the Mavic quadcopter and military-grade options like the Bayraktar TB2, providing unprecedented visibility on the battlefield, enabling more accurate artillery strikes and real-time monitoring of operations. The use of combat drones has played a crucial role in the success of Ukrainian offensives, leading to significant setbacks for Russian forces. The extensive application of UAVs in the Russia-Ukraine war has encouraged governments worldwide to significantly invest in procuring these technologies and integrate them into their military power. Countries bordering Russia and Ukraine significantly hiked their annual military budgets in CY2022, leading them to invest in UAVs. The war also impacted the global unmanned aerial vehicle market growth, with countries like the US, China, Russia, and India investing in advanced military technologies like UAVs.

Key Developments

In August 2023, IAF (Indian Air Force) inducts Heron Mark 2 drones for enhanced strike capabilities marking a significant advancement in the realm of aerial defense and positioned at a forward air base within the northern sector, these cutting-edge drones represent a potent addition to the nation's security apparatus. Equipped with long-range missiles and a sophisticated weapons system, they confer a distinctive advantage to the armed forces in executing targeted strikes against potential adversaries from a considerable distance.

Key Players Landscape and Outlook

The market for UAVs is fragmented due to numerous manufacturing companies operating in both developed and emerging markets. Advanced technical companies are expected to drive technological advancements in propulsion systems and payload characteristics, accelerating the development cycle of mini-UAVs and enhancing their operational capabilities. The introduction of alternative fuel-powered UAVs is expected

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to change the competitive landscape. At the same time, the use of composite-based materials in UAV components could enhance their capabilities and drive widespread adoption across various industries. This fragmentation is expected to drive mini-UAV development and operational capabilities.

For instance, in November 2023, South Korea's Defense Acquisition Program Administration (DAPA) and Boeing agreed to jointly research high-altitude, long-endurance unmanned aerial vehicles (UAVs) to manufacture South Korean-made 'advanced aircraft' with Boeing design. The collaboration aims to strengthen South Korea's drone capabilities in response to North Korea's recent drone threat. The two sides also agreed to cooperate on the maintenance, repair, overhaul, and upgradation of Boeing aircraft used by the South Korean military.

For instance, in March 2023, The Finnish Army announced a USD 2.81 million deal for Parrot ANAFI USA drones. The Finnish Army views the acquisition of Parrot’s training flight equipment as the cornerstone for improving performance and expanding deployment. The small drone would be used by Finnish personnel for surveillance and reconnaissance missions, with a production entirely developed in France and the US. This collaboration highlighted the growing interest in UAVs for military applications and the potential for further international partnerships in this field.

For instance, in February 2022, Northrop Grumman and Echodyne signed a strategic agreement to integrate Echodyne's commercially priced radars into Northrop Grumman's advanced counter-unmanned aircraft system (C-UAS) solutions. The agreement aimed to expand upon existing efforts to integrate Echodyne radars into Northrop Grumman's C-UAS systems, which are used for border security, base security, and other applications. The collaboration was seen as a significant step towards enhancing C-UAS capabilities, leveraging the strengths of both companies to provide effective solutions for countering unmanned aerial threats.

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