PESTEL Analysis:

Political - A political issue in the drone environment is ensuring that drones do not violate privacy or pose safety risks. Due to these concerns, “governments around the world introduced drone regulations and banned drone flights over selected facilities and locations in support of the national security and people’s safety” (Mandourah & Hochmair, 2024). Additionally, the Federal Aviation Administration has required that all drone owners register their drones to help manage these potential safety and privacy issues (Mandourah & Hochmair, 2024).

Social - A social aspect that impacts drone technology is consumer innovativeness. A study was conducted to test how receptive consumers are to innovative technologies, specifically drones for food delivery. The study found that consumers who enjoy trying new products, prefer functional items, seek personal enjoyment, and like to make purchases that impress others, were more likely to have a positive attitude toward drone deliveries (Hwang, Kim, & Lee, 2021). This is important because it highlights society’s perception of drones as an innovative technology.

Technological - A technological aspect of drones is highlighted in Raffaello D'Andrea's TED Talk, where he explains and demonstrates the use of quadcopters. These drones operate using automatic feedback control, relying on algorithms, mathematical models, and control theory to fly (D'Andrea, 2014). D'Andrea metaphorically compares these advanced drone models to real-life athletes, showcasing their abilities to balance, hit objects, and perform various movements. This demonstrates the impressive technological advancements of drones and their potential to handle different tasks efficiently.

Environmental - An environmental benefit of using drones is the reduction of energy consumption and greenhouse gas emissions. This study looks at how airspace planning and different trajectory algorithms affect energy use in unmanned aerial vehicles (ElSayed & Mohamed, 2022). It shows that optimizing trajectory planning can significantly reduce energy consumption, making drone operations more eco-friendly and safer for the environment.

Legal - A legal aspect of drone use is safety and security concerns. Drones, which can weigh anywhere from a few hundred grams to several tens of kilograms and fly at altitudes ranging from one hundred meters to several thousand meters, can pose a threat to people, vehicles, and operations if an incident occurs (Tran & Nguyen, 2022). Additionally, “Drones can collect information and images of organizations or individuals illegally” (Tran & Nguyen, 2022). These risks highlight the importance of strong regulations to ensure drones are used safely and responsibly.

Five Forces:

Substitutes-

Suppliers-

Potential Entrants-

Industry competitors-

Buyers-

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