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Ukrainian Engineers Drive Battlefield Innovation with Ground Robotics

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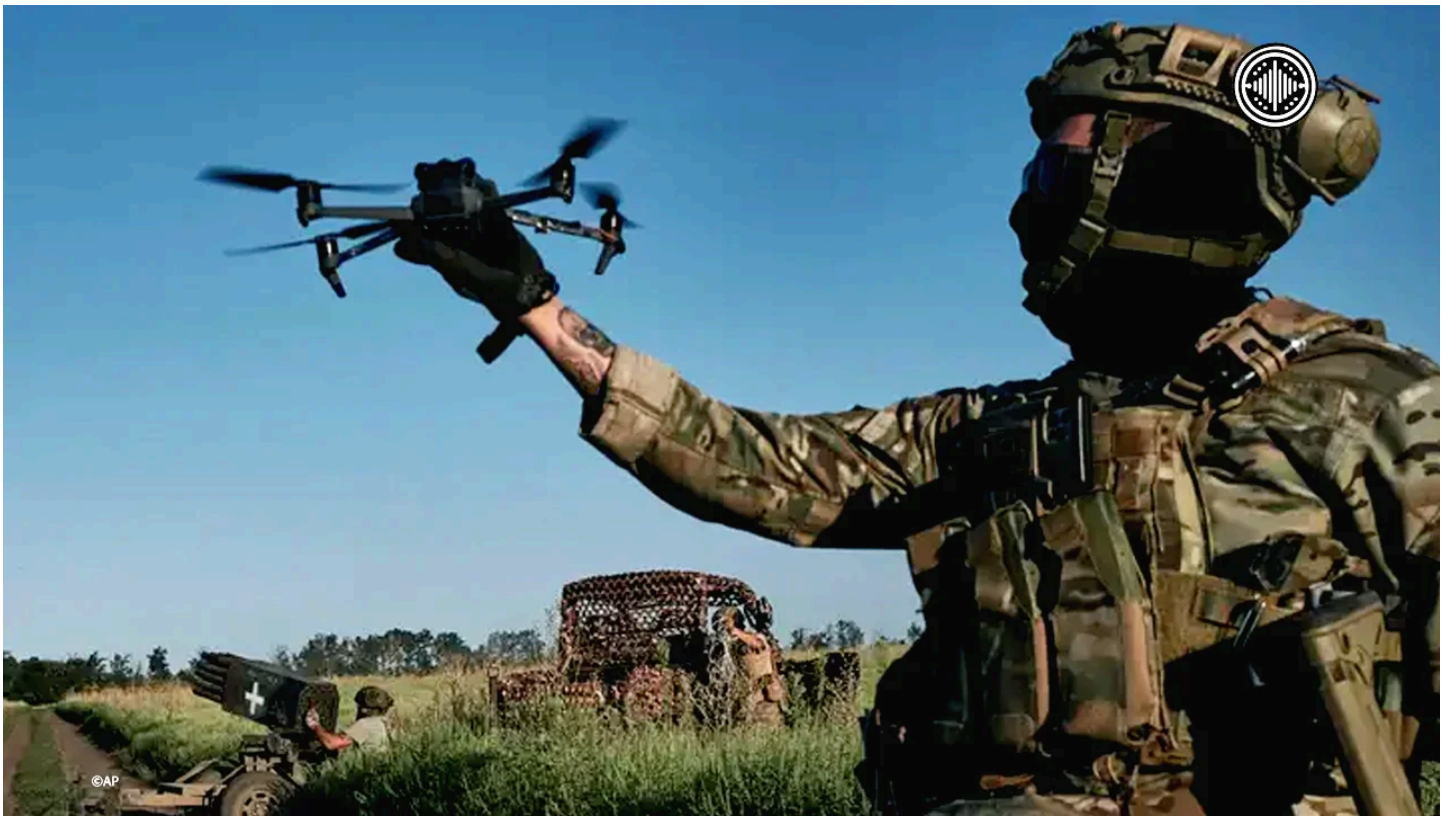

Ukrainian engineers and volunteers are reshaping the modern battlefield through rapid advances in ground robotics and unmanned technology, as the country continues to defend itself against Russian aggression. Now in the fourth year of war, Ukraine's frontline strategy increasingly relies on innovation rather than sheer manpower, with organisations like Dignitas leading the charge in integrating unmanned systems into military operations.

One of the leading figures behind this effort is Lyuba Shipovich, a software engineer and entrepreneur who returned to Ukraine from the United States at the start of the full-scale invasion. In 2023, she co-founded Dignitas, a non-profit group dedicated to supporting the Ukrainian military with cutting-edge technological solutions. The group previously launched Victory Drones, a programme to scale the use of aerial drones in Ukraine's

armed forces. Its newest initiative, Victory Robots, focuses on deploying unmanned ground vehicles (UGVs) across active combat zones.

According to Dignitas, these robotic systems are designed to give Ukraine "every possible advantage to win" while reducing human casualties. Their use has become increasingly vital as Ukraine grapples with personnel shortages, facing a much larger Russian force bolstered by oil revenues and a deeper recruitment pool.

Shipovich plays a key role in bridging the gap between frontline commanders and developers. Each month, she visits military brigades to assess operational needs and push for the adoption of robotic platforms. "We train the military on tech, provide them with tech, and push for systemic adoption of battlefield innovation," she said. Unlike traditional charitable groups, Dignitas not only supplies equipment but also helps develop and validate new technologies in active combat conditions.

The response from Ukrainian units has been enthusiastic. Ground robots are now routinely used for medical evacuation and logistical support, minimising risks to soldiers. In some cases, brigades have conducted successful missions entirely with unmanned systems. In the Kharkiv region, the 3rd Assault Brigade recently executed an operation using only drones and ground robots, capturing enemy soldiers without deploying a single infantryman.

Officers like Oleksandr, platoon commander for ground robotic complexes in the Rubizh Brigade, have praised the practical benefits. "Ground robotic platforms are already proving their effectiveness in logistics, evacuation, and fire support," he said. He noted that their presence improves tactical flexibility and reduces danger for personnel.

At a demonstration near Kyiv, Volodymyr Rovensky, an officer in Ukraine's Land Forces Command, stated that 22 combat units are currently operating ground robots. He reported that 47 percent of missions supported by unmanned ground systems involve logistics and evacuation, while 25 percent are engineering-focused and 12 percent are combat tasks. Rovensky emphasised that future battlefield dominance will hinge on technological superiority.

While full replacement of infantry by robotic platforms remains a long-term goal, Shipovich sees it as achievable. "We must get people out of the trenches and off the front line," she said. "Robots can do the dirty, dangerous work." She added that the vast majority of ground drones used in the military today are Ukrainian-made.

Looking ahead, Shipovich is also exploring broader applications of artificial intelligence to enhance both aerial and ground-based systems. “Technology is everything,” she noted, stressing that Ukraine’s defence now depends on its ability to innovate quickly and scale effectively.

The work being carried out by Ukrainian engineers and volunteer-led organisations is not only transforming the country’s military capabilities but also drawing global attention. As international observers study Ukraine’s approach to modern warfare, the country’s homegrown solutions are setting new precedents in combat robotics.