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Robotisation of Militaries: Organisational, Policy and Operational Issues

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Synopsis

Military organisations world over have to grapple with a range of organisational, policy, and operational issues with the expanding role of robotic systems. This is coupled with increased automation of functions and processes in pursuit of military operations.

Commentary

POPULAR MEDIA historically has been titled towards portraying 'robots' as menacing humanoid machines on a mission to exterminate the human race. In reality, the current robotic systems are more benign—or for that matter sometimes nondescript—ranging from iRobot's cleaning robot Roomba to iPhone's personal assistant Siri to drones hunting terrorists and unmanned ground vehicles sniffing IEDs. In fact, robots and the artificial intelligence that runs them have become so ubiquitous that we have lost the ability to detect their presence among us and sustain our normal functioning in their absence.

Similarly, in case of military applications, robots come in all shapes and sizes—from blimps to buggies to bugs—and gradually acquiring capabilities to undertake missions in all domains of warfare. On this road to robotisation, military organisations have to grapple with a range of organisational, policy, and operational issues, some of which deserve closer attention:

Organisational and Policy Issues

First, organisational inertia: Currently men and women across the military rank and file operate high-end unmanned systems such as UAVs. Most of the missions

undertaken by these systems are mundane and repetitive in nature predominantly focused on surveillance and reconnaissance. To use highly trained soldiers for these kinds of tasks could increasingly prove to be both operationally and financially unsustainable; therefore, one of the more judicious use of resources might be to recruit and train specialists who specialise in operating these systems.

Second, procurement procedures: The prevailing development and acquisition producers for legacy platforms involve billions of dollars in investments spread over two to three decades. Rapid technological changes along with the dynamic nature of the geostrategic landscape make many of these systems obsolete and/ or irrelevant to the emerging mission requirements.

Automated assembly lines with 3-D printing have the potential to fundamentally change the prevailing R&D and acquisition procedures. With rapid prototyping of new systems along with rapid scaling of production, not only the production cycles for legacy systems substantially reduced, but also the production of unmanned systems potentially decentralized.

Third, democratisation of technology: The dual use nature of the robotic systems and their commercial availability allows relative ease in their acquisition by non-states actors and technologically less advanced states. Many of the civilian and military autonomous systems share the same basic sub-systems and sensors. For example, iRobot's' Packbot military robot has its roots in its civilian counterpart. Therefore, the threshold to weaponise an unmanned/ robotic system is very low compared to other dual use technologies such as nuclear or biotechnology.

Fourth, standardisation and interoperability: Since these systems are only at the initial stages of the evolution, it is prudent for countries to formulate policies for standardisation of equipment not only within the services but also possibly aim at interoperability among allies. This process involves platforms with common sub-systems such as platform, battery, and communication along with modular designs with an ability to change sensors and weapons according to the missions.

Interoperability of unmanned systems among allies greatly increases mission effectiveness and efficiency. Currently NATO has a standardisation agreement in place for UAVs and considering similar policies for other unmanned systems; therefore, in the near future a US operator using his or her controller, for example, would be able to control a German or British robot.

From Tactical Generals to Strategic Corporals

Fifth, Tactical generals vs Joystick commanders vs Strategic corporals: One unintended effect of new technologies could be a new culture of micromanagement by the senior leadership. With C4ISR systems providing near real-time picture of the battlefield along with the ability to pick and choose the targets, there is a danger of generals becoming tacticians. For example, during the Vietnam War, the induction of helicopters—relatively a new technology—created an unintended effect of senior commanders hovering over the battlefield to manage the tactics, transforming into "squad leaders in the sky."

A related question is what are the consequences of a young officer who micromanaged or who fought wars through joysticks in virtual reality advances up the ranks to assume operational command. Concomitantly, in the last 10 years infantry squads have gained access to immense air-ground based firepower and real time situational awareness, which at times puts them in situations to take decisions with strategic consequences—the rise of strategic corporals.

Sixth, manned-unmanned teaming: Other than the dull, dirty, and dangerous tasks, manned-unmanned teaming has the potential to create new possibilities in high-intensity missions. For example, drones are ideal platforms for scouting and targeting, whereas attack helicopters like Apaches are excellent at providing superior firepower at short ranges.

This manned-unmanned teaming is useful in delegating the "dull"—possibly dangerous—task of scouting and targeting to drones such as Gray Eagle, whereas Apaches can focus all their time on flight for destroying targets, possibly even from a safe standoff distance.

Robots as Force Multiplier

Seventh, (re-) emergence of mass: Democratisation and commercialisation of robotic technology enables technologically less advanced states or states with limited resources the means to build and field a "mass" of unmanned systems—asymmetrical strategy to create symmetry in a localised conflict. Under these conditions, conventional deterrence increasingly becomes dynamic and is dependent on the specific geographical area, where mass along with speed of deployment, deception, and terrain plays a critical role.

Eighth, limitations on power projection: The diffusion of robotic technologies along with advanced C4ISR systems and precision weapons increasingly places limitations on power projection capabilities as well as alter the offense-defense balance. This new dynamic has relatively more impact on the US, which relies on power projection capabilities not only as a critical element in conduct of its foreign policy but also to secure the global commons.

Over the next 10 years, there is a high probability for robots to emerge as a critical force multiplier, albeit not a game-changer. On this path to robotisation, gradualism is not due to lack of technology but because the need to bring in concomitant changes in organisational, policy, and operational aspects, which are slow to achieve in any large bureaucratic organisation—armed forces are no exception.

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