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CHALLENGES IN ADOPTING MODERN MILITARY TECHNOLOGIES IN CHINA INDIA RUSSIA AND NATO

Kamalov Madrassilla Erkinovich,

*Senior Lecturer at the Military Security and Defense University of the Republic of
Uzbekistan, Tashkent, e-mail: iivakadem@gmail.com.*

Abstract

This paper examines the difficulties of introducing artificial intelligence, unmanned systems and related digital tools into military organisations. It compares selected open publications on China, India, Russia and NATO, focusing on technical capacity, organisational change, strategic competition and responsibility for decisions. The comparison suggests that access to technology is only one part of the problem. Institutions also need trained personnel, dependable data, testing procedures and clear rules for human oversight. The cases draw attention to different pressures, including the integration of research into military practice, dependence on external suppliers and cooperation across national systems. These findings support a gradual approach to adoption, with evaluation and staff training built into each stage. The paper offers a qualitative comparison of published analysis and policy priorities; it does not measure battlefield performance or rank the four cases.

Keywords: artificial intelligence; military technology; unmanned systems; cybersecurity; human oversight; interoperability.

Purpose and approach

Military organisations are considering digital tools for tasks ranging from information analysis to training and equipment support. Their value depends on how well they fit the people and procedures that use them. A system may work in a demonstration yet remain difficult to maintain, explain or connect to existing equipment. This paper asks which barriers deserve attention when military institutions introduce such technologies.

The study uses a focused review of selected open publications rather than a systematic literature search. The sources include an academic analysis of China, a policy commentary on India, a commercial overview of defence AI strategies and



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NATO's published AI strategy [1–4]. They differ in purpose and evidential strength. The comparison therefore identifies recurring concerns without treating all statements as independently verified facts. NATO is considered as an alliance, while the other cases concern individual states. These different units limit direct comparisons.

Findings from the four cases

China illustrates the importance of linking technological development to organisational change. Zhang describes efforts to connect civilian research, education and military needs, alongside changes in military structures and doctrine [1]. The central issue is whether institutions can turn research into dependable working practices. The analysis also raises questions about regional competition and the uncertain effects of AI on strategic stability. It does not establish that investment alone produces reliable military capability.

For India, the reviewed policy commentary identifies dependence on foreign technology and weak coordination between research organisations, industry and military users as barriers to domestic development [2]. This points to a practical concern: a prototype requires sustained funding, user feedback and technical support before it can become a useful service. The implication is that procurement and training should develop alongside research. The commentary provides a policy perspective, rather than a measured comparison of Indian systems with those of neighbouring countries.

In the Russian case, the reviewed industry overview emphasises the tension between strategic ambitions and constraints on access to advanced components and skilled personnel [3]. Such constraints raise questions about long-term maintenance and the ability to expand production. They should not be read as evidence that development has stopped. The available source also does not justify a broad judgement about the ethical conduct of every Russian military institution. The useful lesson for this comparison concerns the dependence of digital programmes on their wider industrial and personnel base.

NATO faces the additional task of making systems work across an alliance. Its revised 2024 AI strategy identifies interoperability, workforce development, quality data and testing as priorities [4]. It also sets out principles for responsible use, including accountability, reliability and the ability to govern system behaviour. These are declared policy goals. Their inclusion in a strategy does not demonstrate consistent



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implementation across all member states. The case highlights the work needed to turn shared principles into compatible procedures and assessment practices.

Discussion and practical implications

Across the cases, the main concern is the relationship between equipment and institutional readiness. Technical choices affect staffing, maintenance and responsibility. An organisation that adopts a system without planning for these needs may become dependent on a supplier or on a small group of specialists. This is an interpretation drawn from the comparison, not a tested causal finding.

A practical response is to introduce new tools in manageable stages. Each pilot should have a defined purpose and an agreed way to judge whether it helps users. Staff should record errors and explain the conditions in which the tool should not be used. Decisions about wider adoption should then draw on that evidence. Training needs to cover the limits of automated outputs as well as routine operation.

For military education in Uzbekistan, these issues can inform classroom exercises using non-sensitive material. Learners could assess an unreliable automated recommendation, discuss who should review it and explain what further evidence is needed. Such exercises would connect digital skills with professional judgement. This is a proposed educational application; its effectiveness would need to be evaluated locally.

Conclusion

The reviewed cases suggest that military digital adoption depends on the capacity to support and supervise technology over time. Priorities differ, but each case raises questions about how institutions organise expertise and manage uncertainty. A cautious course is to connect procurement with staff development, evaluate limited applications before expanding them and make responsibility for decisions explicit. Further research should use comparable evidence on implementation to test these conclusions.

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