Daily Mains Practice Question 23-06-2026

GS-III – Science & Technology

Q1. Modern warfare is increasingly software-defined rather than hardware-driven." In light of this statement, discuss the vulnerabilities faced by India's defence systems due to its dependence on foreign-controlled code. (150 words) (10 marks)

IAS Parliament The Hindu

Answer

Introduction:

“Modern warfare is increasingly software-defined rather than hardware-driven" means that military superiority today depends less on the physical platform (tanks, aircraft, missiles, ships) and more on the software that controls, integrates, and enhances their capabilities.

Main Body

Software Driven technology are primary to Advanced driven Hardware. Real victory depends on Al Targeted Strikes, Real time Processing of Data & Electronic Jamming.

Instead of using Modern military & physical armor, now maneuver is done by rapidly updating algorithms and hacking enemy command networks.

Vulnerabilities faced by India due to foreign dependence

• **Strategic Dependence** – Critical military platforms depend on software controlled by foreign manufacturers influenced by their governments.

• **Cybersecurity Threats** – Hidden backdoors, malware, or software vulnerabilities can facilitate espionage, sabotage, and data theft.

• For instance, the 2026 China’s EseeCloud CCTV breach exposed the risks of foreign software in sensitive sectors.

• **Operational Disruption** – During conflicts, foreign vendors may deny updates, maintenance, or technical support, affecting the readiness of defence systems.

• **Manipulation of Military Capabilities** – Software changes can reduce targeting accuracy, limit operational range, disrupt communications, & compromise battlefield awareness.

• **Intelligence Leakage** – Sensitive military and strategic information may be accessed or shared with external actors.

• **Technology Denial & External Pressure** – Dependence on foreign digital infrastructure makes defence, governance, and economic systems vulnerable to sanctions or directives from other countries.

- Example: India's development of the NavIC satellite navigation system after the Kargil War.

What is the software Driven Defence Initiative taken by India

• A fighter aircraft's combat effectiveness depends on software for sensor fusion, target acquisition, navigation, and weapon deployment (HAL Tejas).

• Missiles rely on software algorithms for guidance, tracking, and precision strikes (BrahMos, Agni-V).

• Drones use AI-enabled software for autonomous navigation, surveillance, and swarm operations (TAPAS BH-201, SWiFT).

Developing of indigenous defence software and digital infrastructure –

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- Example – India's development of NavIC, Tejas, INS Vikrant, Pinaka Rocket System, etc., exemplifies the importance of technological self-reliance.

• Expand R&D investment, and

• Foster trusted international technology partnerships.

Conclusion

In the era of software-centric warfare, digital sovereignty is as critical as military hardware. Reducing dependence on foreign-controlled code is essential for India's national security and strategic autonomy.

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