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The Challenge of India's Digital Sovereignty

Context

- The twenty-first century has made **technology**, **digital infrastructure**, and **data** central to national power.
- Economic activity, governance, communication, and defence increasingly depend on digital systems.
- Recent incidents involving compromised surveillance networks and restrictions on corporate digital services have exposed India's dependence on foreign-controlled technology platforms.
- These developments have intensified concerns regarding **digital sovereignty** and the need for greater **technological self-reliance**.

The Risks of Foreign Dependence

- Dependence on foreign digital infrastructure creates significant risks for **national security**, economic stability, and governance.
- Critical systems such as **cloud platforms**, **authentication systems**, communication tools, and software services are often controlled by overseas corporations operating under foreign legal frameworks.
- Consequently, access to essential services may be influenced by decisions taken outside India.

- Such dependence can affect government functioning, business operations, manufacturing, and financial systems.
- Even when data is stored domestically, effective control may remain with foreign entities.
- As digital technologies become indispensable to everyday operations, the ability of external actors to restrict access poses a serious strategic challenge.

Defence and Strategic Vulnerabilities

- Modern warfare is increasingly **software-defined**, making control over software as important as control over hardware.
- Advanced **fighter aircraft, missile systems**, radar networks, and surveillance platforms rely on sophisticated code that may remain under the influence of foreign manufacturers.
- In times of conflict, this dependence could limit operational flexibility and weaken strategic capabilities.
- The experience of restricted **GPS** access during the **Kargil conflict** demonstrated how reliance on external technology can create vulnerabilities at critical moments.
- As military systems become more technologically advanced, reducing such dependence becomes essential for maintaining **strategic autonomy**.

Global Shift Towards Technological Sovereignty

- The pursuit of technological sovereignty is not unique to India. Several countries are seeking alternatives to foreign software and cloud services.
- France plans to adopt sovereign communication platforms, while parts of Europe are exploring domestic substitutes for widely used digital tools.
- The **European Union** is investing in independent cloud and IT infrastructure, and countries such as **Türkiye** are also reducing reliance on foreign technologies.
- These initiatives reflect a growing recognition that technological control is closely linked to economic resilience, security, and political independence.

India's Unique Challenge

- India's position is particularly significant because of its emergence as a rising global power.
- According to **Power Transition Theory**, established powers often seek to constrain emerging competitors.
- As India's economic and strategic influence expands, technological dependence may become a source of external pressure.
- Maintaining **strategic autonomy** therefore requires control over critical technologies.
- Building a strong domestic technological ecosystem is essential not only for economic growth but also for preserving independent decision-making in an increasingly competitive international environment.

Pathways to Technological Sovereignty

- Continued investment in **semiconductors, cloud infrastructure, digital platforms**, and indigenous software solutions is crucial.

- Successful initiatives such as **UPI** and **RuPay** demonstrate that foreign dependence can be reduced through innovation and institutional commitment.
- Greater participation of the **private sector** in defence production and technological development can accelerate innovation.
- A collaborative model involving government support, research funding, and assured procurement can strengthen domestic capabilities.
- Recent efforts in projects such as the **Advanced Medium Combat Aircraft (AMCA)** indicate movement in this direction.
- International cooperation also remains important. Strategic partnerships can create **mutual dependence**, reducing the risk of unilateral actions.
- The **BrahMos missile programme**, collaboration with **Micron Technology**, and participation in initiatives such as **Pax Silica** illustrate how technological advancement can be achieved through trusted partnerships while preserving national interests.

The Need to Close the R&D Gap

- The most critical requirement is a substantial increase in **research and development (R&D)**
- India's average R&D spending remains significantly below the global average, limiting its ability to innovate and compete in advanced technologies.
- Sustained investment in scientific research, artificial intelligence, electronics, and defence technologies is essential for long-term competitiveness.
- Without a strong innovation ecosystem, efforts to achieve technological sovereignty will remain incomplete.
- Enhanced R&D capacity is therefore fundamental to economic progress, security, and technological leadership.

Conclusion

- Digital and technological sovereignty has become a defining requirement of modern statecraft.
- Dependence on foreign-controlled technologies exposes India to economic, political, and security risks that can undermine national interests.
- Strengthening domestic capabilities through innovation, strategic partnerships, private-sector participation, and increased R&D investment offers a sustainable path forward.
- India's success in securing **technological sovereignty** will play a decisive role in shaping its future **economic competitiveness, national security**, and position in the global order.

The Challenge of India's Digital Sovereignty FAQs

Q1. What is digital sovereignty?

Ans. Digital sovereignty is a nation's ability to control its digital infrastructure, data, and technological systems independently.

Q2. Why is dependence on foreign technology risky for India?

Ans. Dependence on foreign technology can expose India to security, economic, and operational risks during crises.

Q3. How did the Kargil conflict highlight technological vulnerability?

Ans. The Kargil conflict highlighted vulnerability when India faced limitations in accessing precise GPS support.

Q4. What are some examples of India's indigenous technological initiatives?

Ans. UPI, RuPay, and the development of domestic semiconductor capabilities are examples of India's indigenous technological initiatives.

Q5. Why is increased R&D spending important for India?

Ans. Increased R&D spending is important because it strengthens innovation, technological self-reliance, and long-term competitiveness.

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