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12 July

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QUANTUM-SAFE CYBERSECURITY

Ministry of Electronics & IT

Being a digital first economy, India advances its Quantum Preparedness; Meity Launches Whitepaper to guide India's shift towards an Atmanirbhar & Quantum-Safe Cybersecurity

Whitepaper calls upon public & private firms besides strategic sectors to timely identify vulnerable areas, especially those dealing in national security infrastructure, crucial public service data & financial transactions

CERT-In and SISA launch 'Transitioning to Quantum Cyber Readiness' to guide India's shift towards a Quantum-Safe future through encryption innovation

Quantum readiness is a strategic imperative as we prepare for the disruptive potential of quantum technologies especially in cybersecurity – Shri. S Krishnan, Secretary, MeitY

Posted On: 11 JUL 2025 4:29PM by PIB Delhi

India has fast emerged as a global leader in digital payments and online public services. However, this digital leap also brings before us, both the society and the government, the critical responsibility of securing vast volumes of crucial data, financial transactions, and national digital infrastructure including that of civil & defence needs. With quantum computing poised to break conventional encryption methods, the need for quantum-resilient cybersecurity has become urgent. In a major step towards addressing this challenge, the Ministry of Electronics and Information Technology (MeitY), the Indian Computer Emergency Response Team (CERT-In), and cybersecurity firm SISA jointly launched a whitepaper titled "Transitioning to Quantum Cyber Readiness" in New Delhi.

Backdrop: Meity Launches Whitepaper to guide India's shift towards an Atmanirbhar & Quantum-Safe Cybersecurity.
Relevance: GS 3/Science and Technology

About the news

India's rise as a global leader in **digital payments and online services** has also brought the critical challenge of protecting its vast data, financial networks, and national digital infrastructure. In this context, the **Ministry of Electronics and IT (MeitY)**,**CERT-In** and **SISA** have jointly released a whitepaper titled **“Transitioning to Quantum Cyber Readiness”** to guide India’s preparedness for future quantum threats.

Quantum Computing

Quantum computing harnesses the **laws of quantum mechanics** to process information in ways that are fundamentally different from traditional computing.

- Unlike classical bits, which hold a value of either 0 or 1, **quantum bits (qubits)** can exist in multiple states at once.
- This capability allows quantum computers to tackle highly complex problems much faster than classical machines.

Core Principles of Quantum Computing:

- **Superposition:** Qubits can exist in a combination of both 0 and 1 states **simultaneously.**
    - This enables quantum systems to evaluate many possibilities at once, dramatically speeding up complex computations.
- **Entanglement:** Qubits can be entangled, meaning the state of one qubit is **intrinsically linked to the state of another,** even across large distances.
    - This leads to highly efficient and coordinated processing.

- **Quantum Interference:** Quantum algorithms leverage interference to enhance the probability of correct outcomes while diminishing the chances of errors, thereby improving computational precision.
- **Quantum Measurement:** When a quantum state is measured, it collapses to a definite value (either 0 or 1).
    - This step is crucial for extracting meaningful results from quantum computations.

Whitepaper on Quantum Cyber Readiness

- **Guidance for Quantum-Safe Migration**
  - Aims to help organizations across sectors begin transitioning to **quantum-resilient systems**.
- **Framework for Quantum Readiness**
  - Offers a structured approach to prepare for the **quantum threat landscape**.
- **Impact Analysis**
  - Evaluates how **quantum computing** could compromise current **cryptographic systems** and **India's digital infrastructure**.
- **Migration to Quantum-Resistant Algorithms**
  - Recommends strategic pathways to adopt **post-quantum cryptography** for enhanced security.
- **Practical Integration Approaches**
  - Suggests how to embed new security protocols into **existing systems** without disrupting operations.
- **Ensures Compliance & Continuity**
  - Emphasizes maintaining **regulatory compliance** and **operational stability** during the transition.

CERT-In (Indian Computer Emergency Response Team)

CERT-In is the **national cybersecurity agency** under the **IT Amendment Act 2000**, responsible for:

- Collecting, analyzing, and sharing information on cyber incidents.
- Issuing **alerts and forecasts** of cybersecurity threats.
- Taking **emergency measures** during cyber incidents.
- **Coordinating response** to national cyber incidents.
- Publishing **guidelines, advisories, and whitepapers** on cybersecurity practices.
- Performing other government-mandated cyber-related functions.

PRACTICE QUESTION

Q1. With reference to quantum computing, consider the following statements:

1. Qubits can exist in a combination of both 0 and 1 states simultaneously.
2. Entanglement links the state of one qubit with another, even across large distances.
3. Quantum measurement preserves the superposed state of a qubit during observation.

Which of the statements given above is/are correct?

(a) 1 and 2 only

(b) 1 and 3 only

(c) 2 and 3 only

(d) 1, 2, and 3

E-TRUCK INCENTIVE SCHEME

Ministry of Heavy Industries

Azadi Ka Amrit Mahotsav

India Rolls Out First-Ever e-Truck Incentive Scheme Under PM Modi's Green Mobility Vision

HD Kumaraswamy Launches Game-Changing e-Truck Scheme to Cut Freight Emissions and Boost Make in India

GoI Unveils ₹9.6 Lakh Incentive for Electric Trucks to Power Net-Zero Freight Transition

5,600 e-Trucks, Cleaner Cities: PM E-DRIVE Accelerates India's Green Freight Revolution

Posted On: 11 JUL 2025 2:57PM by PIB Delhi

Under the visionary leadership of Prime Minister Shri Narendra Modi and the guidance of Union Minister for Heavy Industries & Steel, Shri H.D. Kumaraswamy, the Ministry of Heavy Industries (MHI), Government of India, has launched a groundbreaking scheme to provide financial incentives for electric trucks (e-trucks) under the PM E-DRIVE initiative. This marks the first time the Government of India is extending direct support for electric trucks, aiming to accelerate the country's transition to clean, efficient, and sustainable freight mobility.

"*Our goal is not just to build infrastructure but to build a future that is green, clean, and inclusive.*"

(**PM Narendra Modi)**

Backdrop: India Rolls Out First-Ever e-Truck Incentive Scheme under PM Modi's Green Mobility Vision

Relevance: GS 3/Economy

About the news

The **Ministry of Heavy Industries** has launched a landmark scheme under the **PM E-DRIVE initiative** to promote **electric trucks (e-trucks)** in India. This is the first-ever **direct government support** for e-trucks, aimed at achieving sustainable freight mobility and reducing emissions. It will drive our nation toward sustainable freight mobility, a cleaner future, and the realization of Viksit Bharat by 2047, in alignment with our net-zero emissions goal by 2070.

e-Truck Incentive Scheme

Key Highlights

- **Rationale**: Though diesel trucks form only **3%** of vehicles, they contribute **42%** of transport-related **greenhouse gas emissions**.
- **Target Vehicle Categories**: Demand incentives will be extended to N2 and N3 category electric trucks..
    - **N2 category Trucks:** Gross Vehicle Weight (GVW) above 3.5 tonnes and up to 12 tonnes.
    - **N3 category Trucks:** GVW exceeding 12 tonnes and up to 55 tonnes.

Objective and Impact

- **Reduces logistics costs**, boosts adoption of **clean energy** in heavy transport
- **Improves air quality**, particularly in urban and industrial areas
- Supports India's goals for **Net Zero by 2070** and **Viksit Bharat by 2047**
- Contributes to building a **self-reliant electric mobility ecosystem**

PM E-DRIVE Scheme

The **PM Electric Drive Revolution in Innovative Vehicle Enhancement (PM E-DRIVE)** Scheme was launched to accelerate EV adoption, develop charging infrastructure, and strengthen India's EV manufacturing ecosystem.

- The scheme came into effect from October 1, 2024, and will remain in force until March 31, 2026.

Key Objectives

- Promote **mass adoption** of electric vehicles (EVs), especially in **public transport**
- Reduce the environmental impact of transportation and improve **air quality**
- Advance **domestic EV manufacturing** under the **Aatmanirbhar Bharat** mission through a **Phased Manufacturing Program (PMP)**

Major Components

- **Subsidies (Demand Incentives):** The scheme provides incentives up to:
  - Rs. 10,000 for **e-2 wheelers**
  - Rs.50,000 for high-end **e-3 wheelers**
  - Rs.35 lakh for **large e-buses**
  - Subsidies vary by vehicle type and battery capacity but are designed to cover a substantial part of your cost.
- **Support for e-Ambulances and e-Trucks**
  - The PM Drive initiative allocates Rs.500 crore each for its promotion.

- **EV Charging Infrastructure:**The scheme supports the installation of:
  - 48,400 chargers for **e-2 and e-3 wheelers**
  - 22,100 chargers for **four-wheelers**
  - 1,800 high-power chargers for **e-buses**

PRACTICE QUESTION

Q2. With reference to India's e-Truck Incentive Scheme under the PM E-DRIVE initiative, consider the following statements:

1. It is the first-ever direct government support scheme for electric trucks in India.
2. The scheme provides incentives as an upfront reduction in purchase price reimbursed to Buyers.
3. The vehicle and motor with a warranty of five years are eligible under the scheme.

Which of the above statements are correct?

(a) 1 only

(b) 1 and 3 only

(c) 2 and 3 only

(d) All of the above

CLOUD COMPUTING

Google to discount cloud computing services for U.S. government: Report

Google will heavily discount cloud computing services for the United States government, in a deal that could be finalised within weeks, the Financial Times reported on Friday

Published – July 11, 2025 10:48 am IST

REUTERS

PRINT

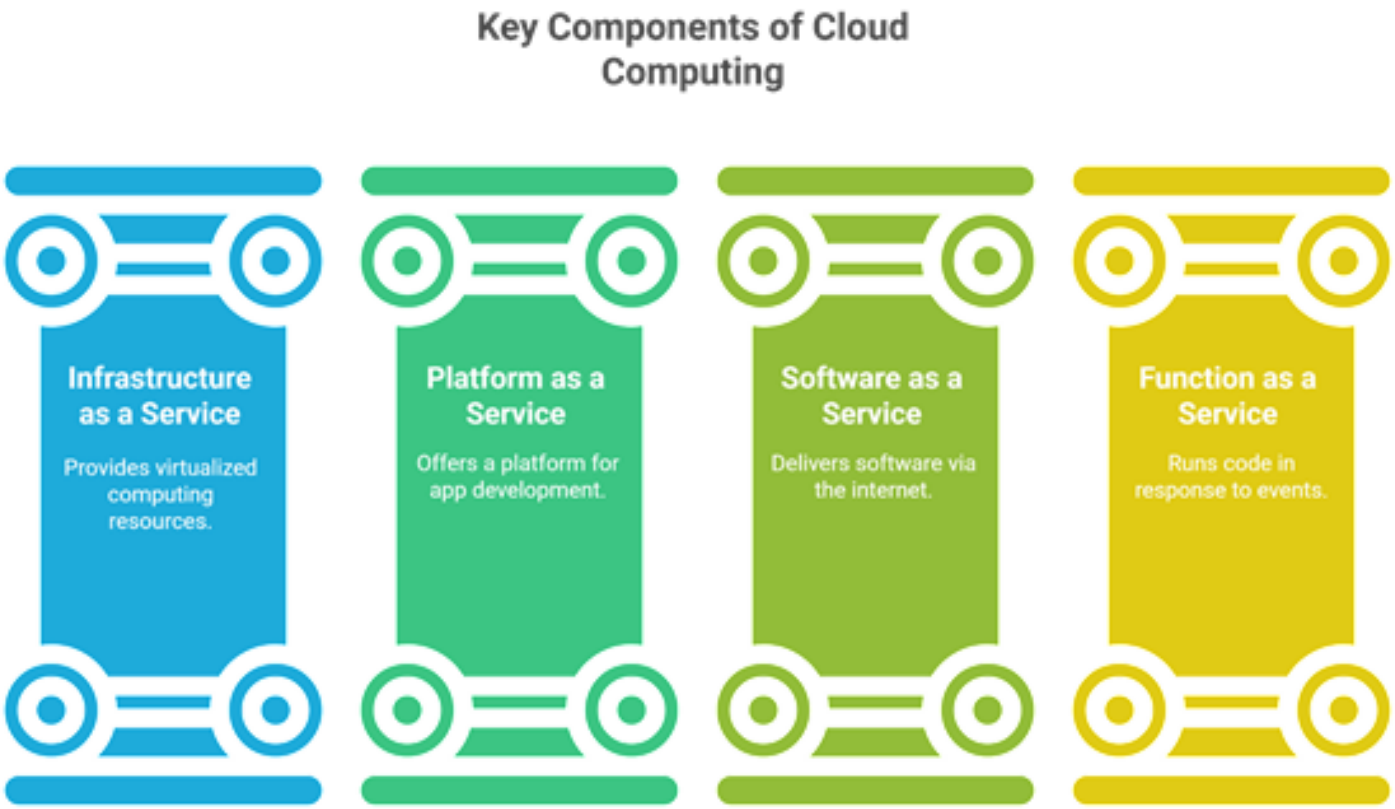
Backdrop: Google to discount cloud computing services for the U.S. government.
Relevance: GS3 - Science and Technology

About the news

Google will heavily discount cloud computing services for the United States government, in a deal that could be finalised within weeks, the Financial Times reported on Friday.

What is Cloud Computing?

Cloud computing is the **on-demand delivery of IT resources**—like servers, storage, databases, networking, software, and analytics—**over the internet** (“the cloud”) with **pay-as-you-go pricing**. Instead of owning physical data centers or servers, organizations can rent access to computing power from a cloud service provider like **AWS, Microsoft Azure, Google Cloud**, etc.



Types of Cloud Deployments

Type	Explanation
Public Cloud	Shared by multiple users; cost-effective and scalable. Example: Google Cloud.
Private Cloud	Used exclusively by one organization. More control, better for sensitive data.
Hybrid Cloud	Mix of public and private clouds; offers flexibility and control.
Community Cloud	Shared infrastructure between organizations with common concerns (e.g., healthcare or banking consortiums).

Why Cloud Computing Matters

Domain	Significance
Business Agility	Enables fast deployment and scaling without heavy upfront investment.
Cost Efficiency	Reduces capital expenditure on hardware and software.
Innovation Acceleration	Supports AI, ML, big data analytics, and IoT with scalable infrastructure.
Digital Services	Powers apps like WhatsApp, Netflix, Zomato, DigiLocker, and online banking.
Data Storage & Backup	Allows organizations to store, retrieve, and back up data remotely.

Challenges of Cloud Computing

- **Data Privacy & Security :** Cloud breaches rose 33% in India (2024), with Aadhaar data leaks and poor storage/API configurations; only 37% firms have cloud security officers.

- **Internet Dependency :** Most cloud services need constant internet, but rural areas face poor speeds; even short outages cause massive losses.

- **Regulatory Compliance :** Digital Personal Data Protection Act, 2023 enforces local data storage, raising costs for global providers; unclear cross-border rules hinder SaaS adoption.

- **Downtime & Outages :** Frequent outages disrupt major services; Indian firms face higher downtime (10.2 hrs/year) with limited hybrid backup use.

PRACTICE QUESTION

Q3. With reference to "Software as a Service (SaaS)", consider the following statements:

1. SaaS buyers can customise the user interface and can change data fields.
2. SaaS users can access their data through their mobile devices.
3. Outlook, Hotmail and Yahoo! Mail are forms of SaaS.

Which of the statements given above are correct?

(a) 1 and 2 only

(b) 2 and 3 only

(c) 1 and 3 only

(d) 1, 2 and 3

PRACTICE QUESTION

Q4. With reference to cloud computing, which of the following best defines the concept?

(a) It refers to creating offline backups of critical digital infrastructure for disaster recovery.

(b) It is the use of satellite-based internet services for faster delivery of IT services.

(c) It is the on-demand delivery of computing services like storage, databases, and servers over the internet on a pay-as-you-go basis.

(d) It is the use of physical data centers owned and operated by organizations for internal computing needs.

SEMICON INDIA 2025

Ministry of Electronics & IT

Semicon India 2025 with First-Ever Global Pavilions, Country Roundtables, Skilling Initiatives, and Design Startup Pavilion to Witness Record Stakeholder Participation

More than 300 companies from 18 different countries to participate; Event to be held from 2nd to 4th September 2025 at Yashobhoomi (IICC), New Delhi

Visitor Registrations open for 'SEMICON India 2025 – with the theme, Building the Next Semiconductor Powerhouse'

Posted On: 11 JUL 2025 1:22PM by PIB Delhi

As the world seeks to strengthen semiconductor supply chains and embrace next-generation technologies to meet Digital Development challenges, India is rapidly emerging as a key player in the global chip ecosystem. Against this backdrop, SEMICON India 2025 becomes a pivotal platform to showcase not only India's intent but its growing capability to build a self-reliant, trusted, and globally competitive semiconductor ecosystem. Driven by scale, innovation, and strategic partnerships, the event builds on the record success of its 2024 edition and reinforces the national vision of Atmanirbhar Bharat.

Backdrop: The fourth edition of Semicon India 2025, scheduled for September 2–4 at Yashobhoomi.
Relevance: GS2 - Science and Technology

About the news

SEMICON India 2025:

- **Global Platform**: One of eight SEMICON expos worldwide, uniting global semiconductor leaders.
- **India's Semiconductor Push**: A flagship initiative to position India as a global hub for chip design, manufacturing, and innovation.
- **Strategic Objectives**: Catalyse global collaboration, boost domestic innovation, and promote India as a reliable and scalable electronics hub.
- **Favorable Ecosystem**: Backed by government support, digital infrastructure, and skilled workforce.
- **Geopolitical Opportunity**: Aims to leverage global chip shortages and supply chain diversification.
- **Vision (MeitY)**: To build a sustainable, globally competitive semiconductor and display ecosystem in India.

Background & Context

- India imports **100% of its semiconductors**.
- The **global semiconductor market** is expected to reach **$1 trillion by 2030**.
- In 2021, India launched the **₹76,000 crore Semiconductor Mission**.
- The **Semicon India Programme (2022–2026)** is implemented by **India Semiconductor Mission (ISM)** under Digital India Corporation.

Objectives of Semicon India 2025

Objective	Description
Attract Chip Manufacturing	Build and support fabs for logic, memory, analog, and compound semiconductors.
Design Ecosystem	Promote 100+ Indian semiconductor design startups via incentives.
Supply Chain Resilience	Reduce dependency on China and East Asia; create India-based back-end facilities.
Talent Development	Train over 85,000 engineers via Semicon India FutureSkills program by 2026.
Global Partnerships	Strategic tie-ups with USA, Japan, Taiwan, and EU firms.

Importance of Semicon India 2025

- **Atmanirbhar Bharat**: Reduces reliance on imports in sectors like electronics, defence, telecom, and automotive.
- **Economic Growth**: Expected to create 100,000+ direct and 250,000+ indirect jobs by 2027.
- **Industry 4.0 Enablement**: Supports AI, IoT, EVs, and the data economy through domestic chip production.
- **Strategic Sovereignty**: Enhances national security by securing critical infrastructure like defence and cybersecurity.
- **Geo-Economic Advantage**: Positions India as a trusted alternative in the global China-plus-one supply chain strategy.

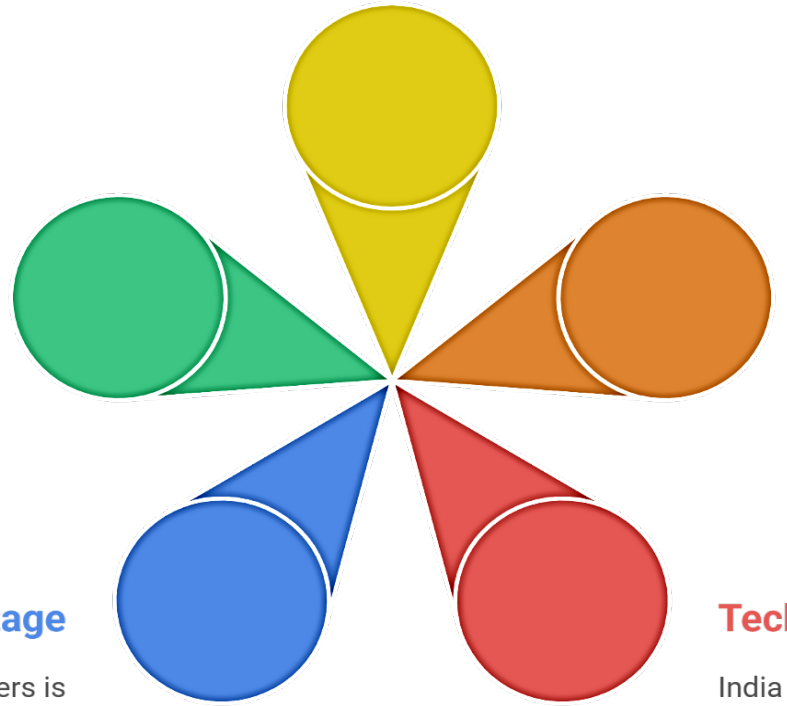
Key challenges for Semicon India 2025

High Capital Needs

Semiconductor fabs need billions of dollars with long payback.

Long Timelines

Setting up fabs takes many years, needing policy and investment.



Resource Intensive

Fabs require massive water and a stable power supply to function.

Talent Shortage

Upskilling engineers is essential for chip development in the country.

Technology Transfer

India needs mature chip-making Intellectual Property and global partnerships.

PRACTICE QUESTION

Q5. With reference to the Semicon India 2025 initiative, consider the following statements:

1. It is India's first semiconductor initiative aimed only at attracting foreign investment in chip fabrication.
2. One of its goals is to build supply chain resilience by reducing dependency on East Asia.

Which of the statements given above is/are correct?

(a) 1 only

(b) 2 only

(c) Both 1 and 2

(d) Neither

SIMULTANEOUS ELECTION IN INDIA

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THE HINDU

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Simultaneous election Bill gives Election Commission of India unbridled powers; loopholes remain: ex-CJIs

At a meeting of the Joint Parliamentary Committee, D.Y. Chandrachud and J.S. Khehar, while rejecting the contention that the Bills violate basic structure of Constitution, have recommended extensive revision

Updated - July 12, 2025 02:41 am IST - New Delhi

SOBHANA K. NAIR

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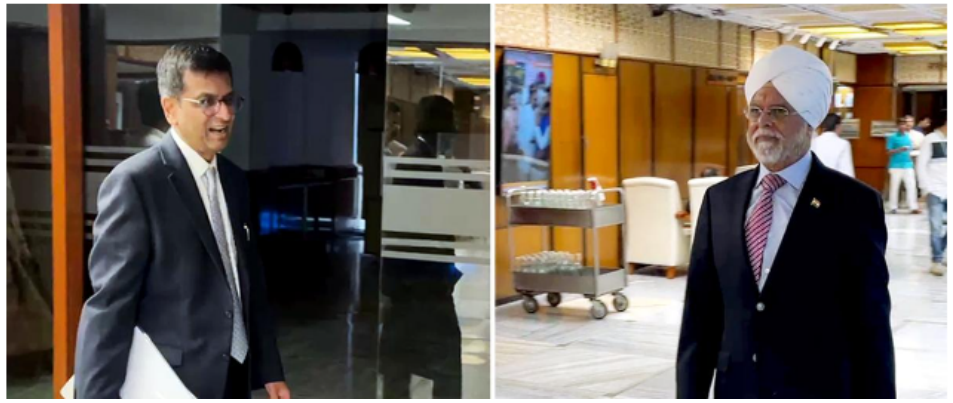
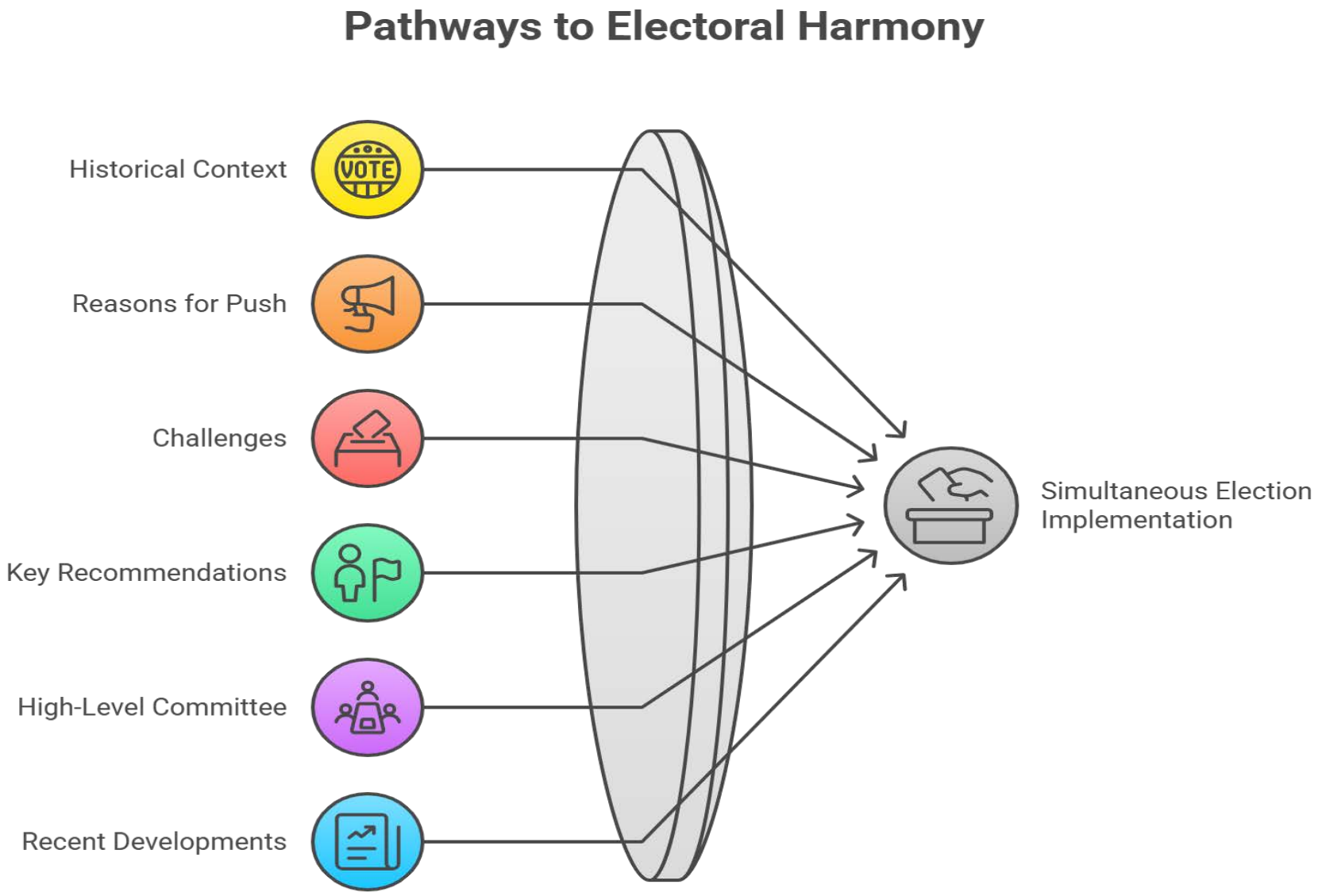


Backdrop: Recent parliamentary committee meeting on simultaneous elections

Relevance: GS 2/Parliament and State Legislatures

To be Discussed



About the news

Recently, the former Chief Justices **J.S. Khehar and D.Y. Chandrachud** appeared before a parliamentary committee reviewing the Simultaneous Elections Bill. The committee, led by MP P.P. Chaudhary, is consulting legal experts. Earlier, former Chief Justices U.U. Lalit and Ranjan Gogoi also gave inputs and suggested some improvements.

Simultaneous Elections

Simultaneous Elections refer to holding elections to the **Lok Sabha (Parliament) and all State Legislative Assemblies** at the same time, once every five years. This means voters across the country would elect their central and state representatives in a **single electoral exercise**.

Historical Context

- In **1951–52, 1957, 1962, and 1967**, elections to the **Lok Sabha and all State Assemblies were held simultaneously**.

- This cycle was disrupted due to **premature dissolutions of the State Assemblies and the Lok Sabha**.

- Since then, **India has witnessed elections almost every year** at some level, leading to frequent imposition of the **Model Code of Conduct (MCC)** and governance paralysis.

Reasons behind the push for Simultaneous Elections in India

- **Frequent Policy Paralysis**
  - Every election invokes the **Model Code of Conduct (MCC)**, which restricts:
    - Announcements of new schemes
    - Administrative transfers
    - Project launches
  - **E.g.,** During the 2019 elections, MCC delayed **Ayushman Bharat hospital empanelment** in some states and stalled infrastructure projects like roads and housing under PMAY.

- **Disruption to Governance & Education**
  - Repeated deployment of government officers as **election staff** (e.g., teachers, revenue officials, and health workers) affects the delivery of essential services.
  - **E.g.,** During the 2022 Uttar Pradesh Assembly elections, **over 3.5 lakh government employees** were deployed, many from the education sector, impacting classroom learning and mid-day meal schemes.

- **Election Fatigue Among Voters**
  - Frequent polls in various states, local bodies, and national elections reduce voter enthusiasm.
  - **E.g.,** In **local by-elections**, voter turnout often dips below **40%**, far lower than general elections.

- **Economic Benefits**
  - The **Kovind Committee (2024)** estimated that simultaneous elections could **boost GDP by 1.5 percentage points**. The reduced disruption would
    - Improve the **investment climate**
    - Curb **inflationary spending**
    - Result in **positive social outcomes** like ↑ school enrolment and ↓ crime rates.
  - The **Centre for Media Studies** estimates that around **₹1.35 lakh crore** was spent on the **2024 Lok Sabha elections alone**. This expenditure could be significantly reduced if elections were held **simultaneously.**

- **Polarization issue**
  - Continuous campaigning fosters **identity politics**.
  - **E.g.,** Polarized campaigning on religious/caste lines has intensified in states like **West Bengal** and **Karnataka** during back-to-back elections.

- **Improved Planning and Resource Use**
  - A synchronized electoral calendar enables:
    - Shared polling stations
    - Common use of EVMs/VVPATs
    - Better coordination of security forces and media coverage

- **Efficient Security Deployment**
  - Each election requires **thousands of police, paramilitary, and CAPF** personnel.
  - **E.g.,** In the 2024 Lok Sabha polls, over **10 lakh security personnel** were mobilized nationally.

- **Better Voter Turnout**
  - Combined elections make campaigns more visible, increase awareness, and streamline voter engagement.
  - **E.g.,** In 2024, **Andhra Pradesh** held Assembly and Lok Sabha elections simultaneously, recording high voter turnouts—**78.36%** for the Assembly and **81.86%** for the Lok Sabha.

Challenges in Implementing Simultaneous Elections

- **Federal Structure Concerns**
  - States fear loss of autonomy as aligning with national elections may override their democratic mandate and timing.

- **Weakened Local Mandates**
  - Regional or local parties may be marginalized, reducing representation of **state-specific** concerns, which affects the federal balance of power.

- **Longer Accountability Gaps**
  - If all elections are held at once every five years, voters lose the **opportunity to express dissatisfaction periodically** through midterm polls or by-elections.

- **Logistical Demands**
  - The Election Commission would require **double the number of EVMs/VVPATs,** additional polling staff, and expanded infrastructure to manage concurrent polls.

- **Legal and Political Consensus Lacking**
  - Requires **broad consensus** across all political parties, especially from regional parties and state governments.

- **Voter Behavior Confusion**
  - Simultaneous elections may blur the distinction between **national and state issues,** affecting informed and issue-based voting at the state level.

Key Recommendations in the Past

- **Law Commission (2018)**
  - Supported simultaneous elections.
  - Recommended **constitutional and procedural safeguards** to ensure feasibility and legal validity.

- **NITI Aayog (2017)**
  - Proposed elections in **two phases**:
    - Phase 1: Lok Sabha + elections in half the states
    - Phase 2: Remaining states after 2.5 years

- **Parliamentary Standing Committee (2015)**
  - Backed the idea of simultaneous polls.
  - Recommended introducing a **constructive no-confidence vote** to maintain government stability and prevent mid-term collapses.

High-Level Committee on One Nation, One Election

The Government appointed **Former President Ram Nath Kovind** to head the high-level committee on Simultaneous Elections.

Key recommendations of the Kovind Committee

- **Two-Step Implementation Plan**
  - **Phase 1**: Synchronize **Lok Sabha and State Assembly elections**.
  - **Phase 2**: Conduct **local body elections (panchayats and municipalities)** within **100 days** of Phase 1.

- **Constitutional Amendments Suggested**
  - Introduce **Article 82A**: To fix a uniform election schedule with a common “appointed date.”
  - Amend **Articles 83, 85, 172, 174, and 356**: To allow for flexible term adjustments of Lok Sabha and State Assemblies.
  - Add **Article 324A**: To empower Parliament to legislate on simultaneous elections to local bodies.
  - Amend **Article 325**: For a **single electoral roll and voter ID** for all levels (Parliament, State, Local).

- **Addressing Mid-Term Dissolutions**
  - If a legislature is dissolved before term completion, fresh elections should be held **only for the unexpired term**.
  - This avoids breaking the synchronised cycle and ensures stability.

- **Handling Hung Houses**
  - In the event of a **hung house**, caretaker governments may function until the next synchronized elections.
  - No-confidence motions should be linked with a **constructive vote of confidence** (like in Germany), requiring a proposed alternative leader.

- **Implementation Mechanism**
  - Set up a dedicated **Implementation Group** to oversee:
    - Legal reforms
    - Election logistics (EVM/VVPAT procurement, polling staff, security)
    - Coordination between Election Commission and State Election Commissions

- **Proposed Timeline**
  - Full synchronization should ideally begin by **2029**.
  - Between 2024–2029, elections to some State Assemblies may need **term adjustments** (curtailment or extension).

Recent Development

- The **Constitution (129th Amendment) Bill, 2024**, along with the **Union Territories Laws (Amendment) Bill, 2024**, was introduced in the **Lok Sabha in December 2024**, aiming to enable simultaneous elections at the national and state levels.
- Consequently, both bills were referred to a **Joint Parliamentary Committee (JPC)** on December 19, 2024, chaired by BJP MP **P.P. Chaudhary.**

PREVIOUS YEAR QUESTION

Q. ‘Simultaneous election to the Lok Sabha and the State Assemblies will limit the amount of time and money spent in electioneering, but it will reduce the government’s accountability to the people. Discuss. (150 words) ***(CSE 2017)***

PREVIOUS YEAR QUESTION

Q. Examine the need for electoral reforms as suggested by various committees with particular reference to “one nation – one election” principle. (150 words)

(CSE 2024)