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This year will belong to AI, the Consumer Electronics Show suggests

At the influential tech event in Las Vegas that opens every calendar year and gives us a glimpse of trends to come, there was a flying car, solar-powered AI-helmet, an AI-powered radio, a robotic vacuum cleaner with arms, unusual wellness gadgets and plenty of other exciting stuff.

NEWS ANALYSIS

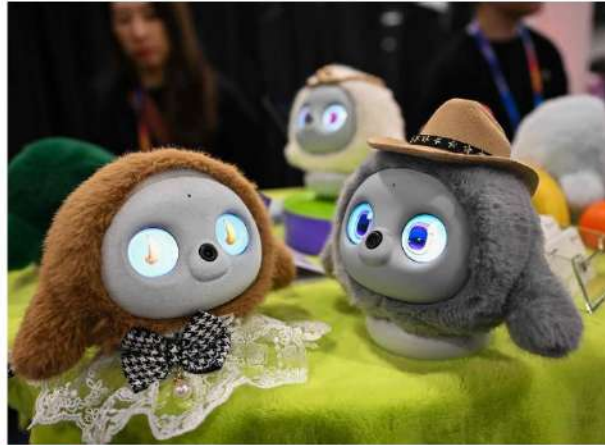
Chitra Narayanan

Till last year, it was only a promise. But this year's mega-tech event displayed how artificial intelligence will truly transform our lives.

At the Consumer Electronics Show (CES), the influential tech event in Las Vegas that opens every calendar year and gives us a glimpse of trends to come, there was a flying car, solar-powered AI-helmet, an AI-powered radio, a robotic vacuum cleaner with arms, unusual wellness gadgets and plenty of other exciting stuff.

Robotic tech

Artificial Intelligence based products and news dominated the show, but robotic tech enthralled too as did futuristic mobility. There was lots of focus on wellness and sustainability and age tech made big strides. Nvidia was the company that created the maximum buzz but the Asian tigers Samsung, LG, and Panasonic pulled in the crowds too. Interestingly, small brands had some of the most interesting tech. For marketers and brands there was plenty to chew over. Here are some trends that we spotted after attending the event virtually. Incidentally, all highlights are on CES.tech.



Robotic therapy: There was a dedicated arena to Age tech, with gadgets like a robotic puppy to soothe dementia patients on show. AFP

Agentic AI

Till now we had been hearing a lot of noise about AI without really getting a grip of how it would change our lives. CES 2025 showed us how it is going to change businesses and individuals substantively. Agentic AI is going to be big. Literally every brand will have an AI agent. And it is quite possible that the AI agent will interact with not a consumer but a consumer's AI agent.

LG with its promise of Affectionate Intelligence



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had a lovable agent Furon. Panasonic introduced us to an AI-powered digital wellness assistant Umi (with powers of reasoning and ability to converse) who would be a help to care-givers. Delta showcased Delta Concierge.

Gadgets get smarter

We already have smart gadgets. But CES 2025 showed us gadgets with an unimaginable level of intelligence. For instance, Samsung's AI powered fridge knows your consumption pattern and gives shopping recommendations. LG showcased an AI radio with a form factor like a speaker that switches programmes to your tastes and moods.

AI was prevalent in every category. From healthcare to cars to aircraft to refrigerators and TVs to even helmets.

Think of the use case for the Exeger (a Swedish deep tech company) and Coson-

ic solar-powered helmet with audio and safety enhancements. The helmet alerts riders to see obstacles without having to turn their heads. Certainly a boon to the thousands of delivery agents out on the roads these days.

Tech companies were giving a lot of thought to rider safety - for instance, there was a solution for cars from LG that captures driver distractions (talking on phone and driving) and sounds alarms.

It was also evident that televisions are certainly not going out of our lives as CES 2025 showed an extraordinary line up of smart screens with AI-integrations.

Age tech comes of age

A heart-warming aspect of CES 2025 was the focus on inclusive tech and particular focus on assistive technology for seniors. There was a dedicated arena to Age tech, with gadgets like a robotic puppy to soothe dementia patients on show. Japanese firm Asahi Kasei showed a detection system that can send alerts to caregivers if someone falls.

Many of the home gadgets on display had features that would be useful to seniors. Even beauty tech players had solutions for seniors with shaking hands who could apply lipsticks and eyeliners without smudging.

Wellness, sustainability Healthcare and wellness, for a while now, has gone mainstream - no longer just the purview of a few companies but integrated into the offerings of literally all consumer electronics firms.

From sleep and fitness monitoring wearables the offerings have expanded to glucose monitoring and mental health and nutrition updates.

As for sustainability, the focus intensified with plenty of the gadgets using renewable energy - especially solar power.

There was a huge focus on battery and energy storage technologies. Some exciting developments like a charging hub where your mobile could be fully charged in two seconds (through a change of battery) were seen.

Riding on partnerships

A noticeable trend at CES 2025 was how many companies were collaborating together.

We saw Sony pairing up with Honda for its EV Afeela, Nvidia announcing it was helping Toyota with its autonomous vehicle development, Microsoft talking about its partnership with Volkswagen, GM and Ford to speed innovation, and many more.

The future lies in big brands collaborating.

(The writer is with *The Hindu businessline*)





ISTOCKPHOTO

How the draft rules for implementing data protection falls short

Although the draft rules provide some guidance for implementing the DPDP Act, they lack detailed guidelines to help improve the lives of India's digital nagriks. The government needs to seek appropriate expert advice, conduct wide consultations, and clarify timelines for implementation

Jhalak M. Kakkar
Shashank Mohan

After a long wait of 16 months, the Ministry of Electronics and Information Technology (MeitY) has released the draft rules for implementing the Digital Personal Data Protection Act, 2023 (DPDP Act). These rules are open for public feedback until the middle of February. Various stakeholders, including civil society, academia, and industry, have been eagerly awaiting the publication of these proposed rules as they contain the baseline implementation framework of the DPDP Act.

The DPDP Act is India's first comprehensive data privacy law that applies to all spheres of commerce and industry. It lays down operational obligations for data processors, special protections for children, and rights for all users, and a body for grievance redressal called the Data Protection Board of India. At the time of release, the DPDP Act was criticised by civil society for not instituting a specialised regulator, not incorporating standard protections against government access to data, and excessive delegation of regulatory functions to the Central government.

Lack of detail

The draft rules propose operative guidance for critical mechanisms such as notice and consent to a user for data collection and processing, intimation of data breaches, collection of parental

consent on behalf of children, data localisation measures, and the procedure for setting up the Data Protection Board. Although the draft rules provide some guidance for implementing the DPDP Act, they lack detailed guidelines to help improve the lives of India's digital nagriks. Let's illustrate some shortcomings from the perspective of two critical avenues that the DPDP Act seeks to introduce – rights of users and the protection of children's data.

User rights

The DPDP Act enhances the autonomy of users over their personal data by providing them with the right to access, correct, complete, update, and erase their data. The law leaves it to the corresponding rules for clarifying the manner in which users can exercise these rights. Unfortunately, the draft rules do not make it clear how users may make these requests. They simply state that users can make requests to data processors for exercising their rights by following the steps published by businesses. This is simply restating what the Act lays down in another language.

For example, as per the right to erasure, can users ask search engines to remove links to certain websites? Courts in India have frequently asked Google to 'de-list' certain links from showing up on its public search engine. The rules could have prescribed standards to clarify the mechanism in these situations such as requiring that users share specific hyperlinks for erasure.

Since the right to erasure may also impact a third-parties' online speech, the draft rules could have articulated certain modes or conditions for objection that data processors could make against such an erasure request. However, the draft rules do not bring out any such clarity.

Protecting children

Today children are increasingly using various websites on the internet including social media platforms.

To safeguard children, the DPDP Act obligates data processors to seek verifiable parental consent before accessing the personal data of children under the age of 18. The manner of obtaining parental consent was to be laid down in the subsequent rules. However, here again the draft rules fall short. There is no detailing of an exact mechanism for identifying children and collecting parental consent. The rules provide that data processors will need to adopt appropriate technical and organisational measures to ensure parental consent is obtained prior to accessing data of a child. The rules focus on how data processors must exercise due diligence for checking that parents are identifiable adults. This is a simple rephrasing of what the law lays down in the DPDP Act.

The rules were required to lay down detailed procedures for how businesses are expected to verify the identity of parents. They simply lay down illustrations where parents could either point to their existing user details on a common platform, or prove their identity

by providing details of any kind of formal identity, for example a government issued ID. Again, critical questions remain.

How will data processors identify parental relations, that is, that the adult proving their identity and providing consent is actually the guardian of the child? What if children lie about their actual age when accessing a website? What mechanisms do platforms need to put in place to gauge the veracity of an age claim? Indian families, including children, often share a single device to access digital services, how will businesses identify children in these cases? The draft rules do not provide any guidance to these practical implementation questions.

Despite a 16-month window for drafting and consulting experts for the framing of these rules, the MeitY has released a document that is vague, incomplete, and rushed. Typically guidelines are very detailed, account for consumer privacy, and provide operational clarity for businesses and data processors. Unfortunately, the proposed rules leave much to be desired.

The government needs to seek appropriate expert advice, conduct wide consultations, and clarify timelines for implementation, before finalising the rules that will form the back-bone of India's first data privacy law.

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Should voter IDs be linked with Aadhaar?

Why was the National Electoral Rolls Purification and Authentication Program launched by the Election Commission? How do already existing voters link EPIC with their respective Aadhaar numbers? What did the Supreme Court mandate in the Puttaswamy case in 2018?

EXPLAINER

Rangarajan R

The story so far:

The Aam Aadmi Party (AAP) and the Bharatiya Janata Party (BJP) have accused each other of manipulating electoral rolls before the Delhi Assembly elections. This has reignited the debate about linking voter IDs/Election Photo Identity Card (EPIC) with respective Aadhaar numbers.

What is the history of the proposal? The Election Commission (EC) had in February 2015 launched the National Electoral Rolls Purification and Authentication Program (NERPAP). This was to address the issue of duplicate entries in the electoral roll and to remove such entries. In order to achieve this, the EC began authenticating EPIC data by linking it with the Aadhaar database. It had linked more than 300 million voters in a span of three months. However, the Supreme Court in an interim order, in August 2015, held that the mandatory use of Aadhaar should only be for welfare schemes and PAN linking. Following this order, the NERPAP exercise was discontinued.

After the Supreme Court's final order in *Puttaswamy* in September 2018, that upheld the constitutional validity of the Aadhaar Act, the EC sought amendments to the Representation of the People Act, 1950 (RP Act, 1950). The Parliament amended the RP Act, 1950 and The Registration of Electors Rules, 1960 in December 2021 to enable the linking of EPIC with Aadhaar. It provided the format in which Aadhaar information may be submitted to the electoral registration officer by a new voter at the time of fresh registration (Form 6; to establish identity) or an existing voter already included in the electoral roll (Form 6B; for the purpose of authentication). Any other listed document may be submitted only if the voter is unable to furnish their



Need to verify: A special camp for linking Aadhaar with voter ID card held in Madurai in 2022. FILE PHOTO

Aadhaar number because they do not have one. However, in order to keep these amendments voluntary in nature, the word 'may' have been used in the amendments. Further, the amendment also specifies that no application for inclusion of name in the electoral roll shall be denied and no entries shall be deleted due to the inability of an individual to furnish or intimate the Aadhaar number due to 'sufficient cause.'

Such individuals may furnish alternate documents like PAN card, Driving Licence, Passport, Bank passbook etc.

While the above amendments were challenged in the Supreme Court, the EC

in September 2023 informed the court that submission of the Aadhaar number is not mandatory. It added that it is looking into issuing appropriate clarificatory changes in the forms introduced for this purpose. However, it may be noted that Form 6 and 6B have not been amended till date and they continue to seek the same details as before from the applicants.

The forms require the voters to declare that they do not have an Aadhaar number to avoid providing the same.

What are the pros and cons?

EPIC linkage with the respective Aadhaar

number would definitely help in weeding out duplicate entries; that is essential. At present, more than 680 million Aadhaar numbers have already been uploaded in the process of finalising the electoral rolls. However, there are some concerns about this exercise that need to be considered.

Firstly, the errors in the Aadhaar database, however minuscule, may result in wrongful rejection or deletion of entries from the electoral roll. Secondly, Aadhaar is only a proof of residence and not a proof of citizenship. Thus, it may not help in removing voters who are not citizens from the electoral roll. It would require a separate effort from the EC.

Finally, while the linkage is to happen at the back end and a mere mention of the Aadhaar number on the EPIC/electoral roll may not by itself be a violation of right to privacy, it may still result in misuse as the electoral rolls are widely circulated amongst political parties.

What can be the way forward?

The right to vote is a constitutional right and declared so by the Supreme Court in various cases. It is part of the basic structure of free and fair elections and cannot be constricted through legislative action. Citizens are the most important stakeholders in a democracy and any electoral process should gain their confidence. There must be wide publicity about the benefits of linking EPIC and Aadhaar to clean up the electoral roll of duplicate entries, which in turn strengthens the electoral process. Any misplaced concern amongst voters about the secrecy of their vote being compromised because of this linking should be assuaged.

Meanwhile, the forms should be suitably modified without any delay, to reflect that providing Aadhaar is not mandatory, as per the submission of the EC in the Supreme Court in September 2023.

Rangarajan R is a former IAS officer and author of 'Policy Simplified'. Views expressed are personal.

THE GIST

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The reforms needed in the MEA

India is on the rise, thanks to its consistent economic growth, political stability, and a bold, autonomous foreign policy. Whether it is the success of its G20 presidency, its strategic autonomy during the Russia-Ukraine conflict, its leadership in vaccine diplomacy during COVID-19, or its initiative in voicing the concerns of the Global South, India has established itself as a major player in global affairs.

However, with this increased global stature comes the need for an organisational framework that supports and sustains such ambitions. The Ministry of External Affairs (MEA) needs to keep pace with the demands of this new era and evolve to meet them. A critical examination of its staffing, structure, and operational approach reveals significant gaps that must be addressed urgently.

Areas of improvement

The MEA is staffed with about 850 Indian Foreign Service (IFS) officers tasked with formulating and executing foreign policy across 193 embassies and consulates worldwide. While the annual intake of IFS officers has increased from 12-14 to 32-35 in recent years, it remains grossly inadequate. Comparatively, the U.S. has around 14,500 foreign service officers; the U.K., 4,600; and Russia around 4,500 officers.

Given the current intake rate, India would require decades to reach an optimal workforce of 1,500 officers. To address this challenge, the Ministry should consider lateral hiring and absorbing officers from other government services, including defence personnel with experience as defence attachés and academics specialising in international relations. Such recruitment should be subject to stringent selection criteria and probation periods to ensure quality. Additionally, consultants could be engaged for specialised roles. The current perception is that they are stop-gap appointees.

The MEA's internal structure



Col Rajeev Agarwal (retired)

Former Director at Ministry of External affairs, New Delhi

India has established itself as a major player in global affairs. The Ministry of External Affairs needs to keep pace with the demands of this new era

requires reorganisation to reduce fragmentation and improve coordination. It has many small divisions, especially territorial ones, which often result in inefficiencies. For instance, India's immediate neighbourhood, a declared priority in its foreign policy, is managed by four separate divisions: the PAI Division (Pakistan, Afghanistan, and Iran), the BM Division (Bangladesh and Myanmar), the Northern Division (Nepal and Bhutan) and the IOR Division (Sri Lanka, Maldives, and other nations in the Indian Ocean Region). While inputs from these are collated at higher levels, such fragmentation increases the risk of oversight and hinders cohesive regional engagement.

Similarly, the Gulf Division oversees eight Gulf countries, and the WANA Division handles the rest of West Asia and North Africa. Surprisingly, Iran and Türkiye, two pivotal nations in the region, do not fall under either division. Instead, Türkiye is managed by the Central Europe Division, while Iran falls under the PAI Division. Many similar misalignments highlight the need for restructuring and consolidating divisions to create a more efficient and integrated approach.

While officers posted abroad enjoy substantial financial and administrative support, their counterparts in Delhi face significant challenges. Housing facilities have improved, but are still inadequate to accommodate the growing cadre. Furthermore, financial incentives and allowances for officers posted in India are limited, making domestic postings less appealing than foreign assignments. Providing better housing, medical coverage, and educational facilities for their families could work wonders for the morale of these officers. Also, offering financial incentives for Delhi postings could help. After all, this is where critical assessments are made, and key policies are formulated before being executed abroad.

The MEA has long debated the

balance between generalist and specialist roles within the IFS. Language skills, a key aspect of diplomatic expertise, often fall victim to the rotational posting system. Officers undergo rigorous training in one foreign language during their initial years and are typically posted in countries where that language is spoken. However, subsequent postings often do not align with their linguistic expertise, reducing the long-term benefits of this training.

To address this, at least one language-trained officer should be posted in each embassy to reduce dependence on interpreters. Often, in tricky negotiations, language skills have proved to be a game changer, and the Ministry could leverage this aspect. Moreover, as officers progress in their careers, they should be encouraged to become specialists or subject matter experts.

As technology increasingly influences foreign policy, the MEA must build capacity in fields such as cybersecurity, space policy, and artificial intelligence. Expecting all IFS officers to master these highly technical areas alongside their core responsibilities is unrealistic. Instead, the Ministry should hire and retain domain specialists who can focus exclusively on these issues throughout their careers.

Steps in the right direction

Despite these challenges, the MEA has made significant efforts to evolve. The establishment of divisions such as Policy, Planning and Research, and the Centre for Contemporary China Studies, reflects its intent to adapt to emerging global trends. The dynamic leadership of Dr. S. Jaishankar has been instrumental in the display of innovation and greater assertiveness in foreign policy and also, as he emphasises, in aligning foreign policy with India's aspirations to become a 'Viksit Bharat' (Developed India).

As India moves towards its 100 years of independence in 2047, its foreign policy must evolve in tandem with its global ambitions.

Law by reflex

Good implementation, not stringency of law, will deter sexual crimes

The tendency to make existing laws more stringent is an administrative reflex action often occasioned by political problems set off by particular crimes. The amendments enacted by the Tamil Nadu Assembly to criminal laws on sexual crimes against women fall under this category. In response to the Opposition moves to corner the DMK regime after a rape within the premises of Anna University in Chennai, the government has moved to enhance punishments under the penal and procedural laws. That the perpetrator is a DMK sympathiser and that some details of the student survivor were leaked added political sharpness to the general criticism over such an offence happening inside the campus. At pains to deny any leniency and overcome the setback to its image after the Madras High Court formed a special investigation team, the DMK government has chosen to amend the law based on the theory that more stringent laws deter sexual assault and harassment. This belief is not founded on any statistical or empirical evidence, but is often invoked by those in government. This invariably means the use of legislative power to send out a political message that the administration is committed to women's safety. After all, necessary amendments need not have to wait for a brazen crime or a public outcry.

This is not to say the amendments are unreasonable: they enhance punishments for a range of sexual offences and extend bail-denying features to such offences as well as those under the POCSO Act. Also welcome is the new provision for passing binding protection orders that will ensure perpetrators do not contact survivors by any means. The death penalty has been introduced for acid attack that results in the victim being reduced to a vegetative state. On the other hand, the newly introduced definition of harassment of women to cover the use of digital and electronic means and even non-verbal means may be too broadly worded and prone to misuse. Few would disagree with the enhancement of jail terms for rape, sexual assault, sexual harassment, stalking and voyeurism, but a question does arise whether the mere increase in the quantum of punishment increases the possibility of conviction or reduces the incidence of these crimes. The onus of arresting offenders, gathering credible evidence and proving it in court remains the same. Impartial investigation and resisting pressure for a cover-up while effectively implementing existing laws are more crucial for demonstrating commitment to women's safety. Making workplaces, public space and homes safer for women will work better than merely adding to the severity of laws.



Draft digital data protection rules and authoritarianism

In August 2024, as India marked six years since the K.S. Puttaswamy judgment reaffirmed privacy as a fundamental right, the Internet Freedom Foundation hosted its annual "Privacy Supreme" event – not as a celebration, but as a sombre reflection on its unfulfilled promise. Social activist Nikhil Dey shared chilling accounts, from Ajmer in Rajasthan, on how Aadhaar, heralded for efficiency, has excluded vulnerable residents from pensions and rations. This grim reality must be central to tech policy discussions, including the Draft Digital Data Protection Rules, 2025.

Executive overreach, scant transparency
Rulemaking typically fleshes out legislation, ensuring laws passed by Parliament are enforceable while maintaining administrative flexibility. Yet, the draft Data Protection Rules provoke concern on questions of executive overreach and vague governance. Some earlier analysis here bears repetition for these rules are a conscientious pupil in obedience of its master. Here, its parent is the Digital Personal Data Protection Act, 2023, that was rammed through Parliament as "a product of the subversion of the democratic process". There is more than a mere lack of trust in how the law was created, for its substantive provisions advance a broader policy of "total state control – a digital leash to yank us and make us stand in line than to serve the preambular objectives of the Constitution of India". Its provisions are deliberately vague, granting broad discretion under the nebulous phrase "as may be prescribed".

Despite the Act's swift passage on August 9, 2023, its implementation remains in limbo. Sixteen months later, the draft Rules have been unveiled for consultation. But are they truly "public"? Published as a 51-page pdf (in Hindi/English as a gazette notification), with a three-page explanatory note that reads as AI glop, a simplistic and vague summary offers little insight into the policy choices during drafting. Comments can only be submitted through the MyGov platform that might encourage expert input but restricts broader participation.



Apar Gupta

an advocate and the founder-director of the Internet Freedom Foundation

There is a common thread with the parent Digital Personal Data Protection Act, 2023, with its digital leash

Transparency is undermined by the government's decision to treat submissions as fiduciary, precluding public disclosure and counter-comments. This controlled feedback process resembles a "corporate consultation" rather than a public one.

Substantively, the Data Protection Rules build on a framework of intentional vagueness and executive dominance. Many compliance obligations are either self-determined by companies handling personal data or left to government discretion. Consider Rule 3, which governs consent notices. It mandates "clear and plain language" but fails to define these terms, leaving interpretation subject to India's vast linguistic and comprehension diversity. Without specific standards, notices risk being overly generic or oversimplified, omitting critical details. Similarly, while the Rules require an "itemized description" of data, they do not clarify whether the disclosure is for categories such as financial or health data; or to specific data points such as account numbers, or even metadata and inferred data. Nor do they define timelines for data breach notifications to users, raising risks for individuals in urgent situations. Such ambiguities, if purely administrative, should have been resolved by the standard setting powers of an independent regulatory authority that does not exist.

No independence for Data Protection Board

The vagueness reflects deeper structural flaws. The Act eschews the creation of an independent regulatory body, instead, consolidating power within the Union Government. Through informal interactions and gazette notifications, the government wields unchecked authority over citizens and the digital marketplace. Even the Data Protection Board (DPB), which has a limited ambit of jurisdiction to adjudicate on breaches, lacks independence. The Board's chairperson is selected based on recommendations of a search and selection committee chaired by the Cabinet Secretary, raising critical concerns. How will the

committee address the critiques of political control that plague similar appointment processes? What value does the search committee offer when it has advance knowledge that its recommendations are not binding on the Union Government?

Even after its formation, the DPB is hamstrung. Its authority is largely limited to determining data breaches, and its independence is compromised by service conditions of its members to central government employees. This contravenes long-standing recommendations, such as the 2006 Planning Commission consultation paper on regulation, which emphasised that "the selection, appointment, and removal of chairpersons and members should be insulated against any perceived interference or

manipulation that may influence the outcome". How will a subservient DPB apply data protection effectively? Rule 5 exempts data processing for subsidies from consent requirements. In such cases, can there be any meaningful accountability? It is not unreasonable to foresee scenarios where the DPB may fail to act promptly or effectively, particularly

when complaints involve powerful government entities such as the UIDAI that handles Aadhaar. It raises fundamental doubts about what it means for community organisations that may approach it for redress on user rights for things as simple as getting a data record corrected to receive rations.

Finally, regarding Rule 22, which contains the power of the government to requisition information, there is an absence of limitations and safeguards. As many may read this column, they may still wonder why the data protection rules are too late, too little, too vague? The answer may be provided by Mr. Dey who framed his characterisation of the digital policies of the Indian state with a reference to Through the Looking-Glass. When Alice probes Humpty Dumpty on how the same word can have different meanings, his reply captures the core of India's data protection regime: "The question is... which is to be master – that's all."



UNDERSTANDING THE DPDP ACT



India's data protection rules need some fine-tuning

On January 3, 2025, the Ministry of Electronics and Information Technology (MeitY) released the much-anticipated Draft Digital Personal Data Protection (DPDP) Rules – a key moment in India's journey to regulate digital personal data. This step follows the passage of the DPDP Act, 2023, bringing India closer to operationalising its framework for safeguarding personal data.

The draft rules represent a departure from the earlier and controversial Personal Data Protection Bill, which many deemed was overly restrictive and even hostile to industry interests. The Bill underwent extensive framing, reframing and consultations over nearly a decade, only to be rescinded when committees and government stakeholders wisely decided it was untenable.

In contrast, the positive response to the DPDP Act and its accompanying rules, reflected in conversations with businesses and in media coverage, stems from the less prescriptive, principles-based approach of the draft rules.

Unlike the earlier rush to regulate under the so-called "Brussels Effect", where global digital rulemaking mirrored the European Union (EU)'s interventionist regulatory ethos, India has taken a more pragmatic stance. The EU's General Data Protection Regulation (GDPR), once hailed as a gold standard by privacy experts, now faces criticism for unintended consequences – favouring well-resourced corporations, stifling smaller enterprises, and failing to significantly enhance public trust in the Internet. India's measured approach thus far offers a refreshing alternative to Europe's interventionist policies.

The hits as pragmatism and flexibility

One of the draft rules' standout features is their principles-based framework for notice and consent. While the GDPR has cumbersome requirements, such as notifying users of indirect data acquisition, cross-border data transfers, and automated decision-making processes, India's rules emphasise simplicity and clarity. This helps reduce "consent fatigue", a significant issue in Europe, where users are inundated with unnecessary details, such as the location of data processing – information of little practical use.

In 2023, the European Commission introduced the Cookie Pledge Initiative to address growing frustration over incessant consent pop-ups. However, such course correction would have been unnecessary had the EU taken a less invasive approach to regulating user interfaces and consent mechanisms. The very existence of this pledge highlights the burdens created by prescriptive regulation.

India's DPDP Rules sidestep these pitfalls by focusing on outcomes rather than processes, empowering users without drowning businesses and consumers in unnecessary complexities. The



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rules avoid dictating how entities should enable users to exercise their rights to correction, erasure, nomination, withdrawal of consent and to seek information from entities. They require only the publication of relevant information on apps and websites. In contrast, the GDPR is prescriptive about how similar information should be presented, including instances where entities may need to provide this information orally to users. Why should the state dictate every aspect of an app or website's design or user interface? India's approach, thankfully, respects business autonomy and innovation.

The processing of children's personal data requires stricter protection compared to other types of data processing – which the rules provide for. However, as more children engage with digital technologies online, they increasingly benefit from certain activities, such as monitoring and tracking, which are of value in specific contexts. Take the case of educational institutions, including supplementary education and vocational training services. They rely on activities such as behavioural monitoring and tracking to deliver targeted interventions tailored to students' academic performance. These practices leverage the benefits of learning management systems, which personalise instruction and improve educational outcomes. Recognising this, the rules thoughtfully allow exemptions for specific industries. Educational institutions, clinical and mental health establishments, allied health-care providers, and child-care centres are not required to verify parental consent for tracking and behavioural monitoring, as long as they adhere to guardrails. The exemption for such industries demonstrates a nuanced understanding of industry-specific needs, reflecting the principles of thoughtful policymaking.

The misses as data localisation, overreach

However, the draft rules are not without flaws. Their provisions for restricting cross-border data flows introduce unnecessary complexity and ambiguity. Significant Data Fiduciaries (SDFs) – large enterprises handling substantial data volumes – face potential localisation mandates that extend beyond the legislation's original scope. While the DPDP Act allows the government to restrict personal data transfers, it limits such action to specific notified countries. Differentiating between SDFs and smaller entities, where the second enjoy relaxed transfer rules for the same data, creates the risk of regulatory arbitrage. Smaller entities could exploit the lighter regime to gain an unfair advantage. These inconsistencies may deter investment and drive businesses out of India. The localisation provision likely stems from the challenges faced by law

enforcement agencies in accessing cross-border data for investigations. While these agencies undeniably need access to such data, a narrower sectoral approach to localisation could prove more effective than a centralised one. The Reserve Bank of India's 2018 mandate for localising payment data is a prime example of proportionate regulation. Tailored specifically to the financial sector, it effectively addressed legitimate industry concerns without causing too many business disruptions. Applying this approach to personal data could balance security and compliance with economic competitiveness.

Some areas still require greater clarity. Businesses need safeguards to verify whether users requesting information about data processing are legitimate. This necessity is acknowledged even in the GDPR. However, India's draft rules do not address scenarios where businesses face incessant information requests or



UNDERSTANDING THE DPDP ACT

provide scope for businesses to charge a reasonable fee for requests which are excessive or even unfounded. A related ambiguity is whether the government can demand access to sensitive business data. If so, how will it ensure the protection of such information from falling into the hands of competitors? What if this information is a trade secret? These gaps highlight the need for thinking about procedural integrity.

What lies ahead

According to IBM, data breaches cost Indian businesses an average of ₹19.5 crore (\$2.35 million) in 2024. Compliance with data protection laws should not be seen as a regulatory obligation, but as critical to protecting business reputation and ensuring continuity.

India must also move beyond reliance on notice-and-consent mechanisms to safeguard citizens' privacy in future laws. Notice and consent originate from the medical profession, where they can still be deemed to work effectively in controlled settings. However, in environments such as malls, airports, or even beaches, individuals have little opportunity to provide consent. With the convergence of the Internet of Things, 5G, and artificial intelligence enabling unprecedented data collection, India must envision privacy frameworks that do not exclusively rely on the fallible principle of consent. As public consultations refine the draft rules, prioritising preservation of the framework's flexibility and industry-specific accommodations is key. This approach will help maintain a balance between innovation, economic growth, and individual rights – something not many jurisdictions have managed to get right.

The views expressed are personal

The largely positive response to the Draft Digital Personal Data Protection (DPDP) Rules flows from its less prescriptive, principles-based approach



WHAT IS IT?

IMD: India's weather tracker

Vasudevan Mukunth

On January 15, 2025, the India Meteorological Department (IMD) will turn 150 years old.

The organisation was set up by the provincial British government in the country in 1875, and its first (Imperial) Meteorological Reporter was Henry Francis Blanford. The IMD's genesis can be traced to the importance of the monsoons over South Asia and the formation and effects of cyclones from the Indian Ocean.

Its formation was particularly accelerated by the 1864 Calcutta cyclone, which devastated the city and left more than 60,000 people dead, and the Orissa famine that followed just two years later because the monsoons had failed. So the government at the time decided to funnel weather data collected around the country into a single set of records, managed by a bespoke organisation. This organisation was the IMD.

It was originally headquartered in Calcutta but by 1944 had moved to New Delhi. In independent India, the IMD became a member of the World Meteorological Organisation in 1949.



Students taking part in an event to mark the 150th anniversary of the India Meteorological Department (IMD) in Chennai. ANI

The IMD currently operates six Regional Meteorological Centres, a Meteorological Centre in every State capital, plus a panoply of centres for various meteorological services. Aside from tracking and studying phenomena like rainfall and cyclones, the IMD helps record earthquakes and atmospheric pollution and generates alerts and warnings about impending anomalous weather. It also maintains a complicated communications system that collects data from a variety of sources, including ground observatories, naval vessels, atmospheric balloons, and satellites.



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An unlikely mystery: studies shed new light on how genes are made

In 1970, Japanese-American biologist Susumu Ohno proposed that the main source of new genes is gene duplication. When the body's genome has two copies of the same gene, one copy can continue to provide the original function while the other is free to mutate and acquire new functions

D.P. Kasbekar

The likeness of identical twins can be startling. They are alike because all their genes are alike. Genes are those segments of the genome where, if changes occur, the characteristics of an organism change. Non-identical twins vary in 50% of their genes and are much less alike. Thus, genes define our individuality in many ways.

In December 2024, two research groups addressed how new genes are created. The University of Nevada, Reno, group reported its findings in *Molecular Biology and Evolution*, and the other, from the Max Planck Institute for Evolutionary Biology Plön, Germany, reported in *Genome Biology and Evolution*.

The 24 molecules

A group of 24 molecules of DNA gives identity to our 24 chromosomes. These are the chromosomes numbered 1 to 22 and the sex chromosomes X and Y. Our cells contain two sets of the genome: one derived from the mother's egg and the other from the father's sperm. Eggs and sperm receive only one chromosome of each pair. When they fuse and form the zygote, the latter has two sets again. The zygote then multiplies to form a baby.

The cells in human bodies possess two copies of chromosomes 1-22. Biological females have two X chromosomes, whereas biological males have an X chromosome and a Y chromosome.

Identical twins arise from a single zygote, while non-identical twins arise from two zygotes produced simultaneously.

Each DNA molecule has two strands held together by bonds between compounds on the strands, called base pairs. Our genome contains 3.2 billion base pairs. A gene is typically a few-thousand base-pair-long segment of DNA.

When a gene is 'expressed,' it means a cell will transcribe the underlying base pair sequence to a molecule called messenger RNA (mRNA), and read the mRNA like a recipe to make a protein.

In the human genome, there are 20,000 protein-coding genes and 20,000 genes that code to create RNA that influences the expression of other genes. There are also some genes, called promoters and enhancers, which tell the cell when and where other genes are copied into mRNA.

Two compounds involved in forming the base pairs are cytosine and thymine. Sometimes the cytosine molecules bind to a methyl ion and are said to be methylated. A methylated cytosine



Each DNA molecule has two strands held together by bonds between compounds on the strands, called base pairs. Our genome contains 3.2 billion base-pairs. Representative illustration. GETTY IMAGES/ISTOCKPHOTO

molecule is likelier than an unmethylated one to mutate and become a thymine molecule.

Duplications create new genes

In 1970, Japanese-American biologist Susumu Ohno proposed that the main source of new genes is gene duplication. When the body's genome has two copies of the same gene, one copy can continue to provide the original function while the other is free to mutate and acquire new functions.

Ohno's proposal was simple but had one flaw: it didn't explain how the organism's cells would deal with producing twice the quantity of the same proteins as a result. Protein over-expression can lead to debilitating conditions. The University of Nevada, Reno, researchers addressed this problem.

Humans and mice last shared a common ancestor 75 million years ago. The researchers compared genes duplicated in human or mouse genomes, those duplicated in both, and those not duplicated in either.

They found the promoters of duplicated genes had more methylated DNA than the promoters of genes that hadn't been duplicated. Increased methylation would have prevented the cells from manufacturing twice as many proteins, minimising the ill effects of duplication and allowing the duplicate gene to survive long enough to acquire

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new functions.

The researchers reported that the higher rate of methylation also elevated the rate of mutation.

Random sequences to incipient genes

The Max Planck Institute group inserted exogenous DNA into a population of cells derived from a human. (Exogenous means the DNA came from sources separate from the cells.) The researchers were careful to insert the DNA at a specific site in the genome and allowed the cells to make proteins with them.

The exogenous DNA had a chunk that consisted of a random sequence of base-pairs – which means the proteins the cells made with it would be random as well.

The researchers put together a collection of cells of 3,708 types and nurtured them for 20 days. At regular intervals they checked the relative abundance of different cell types.

After 20 days, the team found that 53% of cell types had become less abundant, 8% more abundant, and 40% didn't swing either way. That is, more often than not, random DNA sequences affected cell

growth and thus became relevant for evolution to act upon.

In yet other words: the random DNA inserts behaved like incipient genes.

Keeping vs. chucking a gene

For a genome to retain a gene, it must have some use, or the genome allows it to mutate. But establishing a gene's usefulness is challenging.

Consider blood groups. Individuals can have one of four groups – A, B, AB or O – depending on which variants of the *ABO* gene they've inherited. If a person receives A and A or A and O, they have the A blood type. If they have B and B or B and O, they have the B blood type. If they have A and B or O and O, then they have the AB or the O blood types, respectively.

In sum, every individual lacks either one or two of the variants, which means no variant is really essential. The O variant also encodes a protein with no known function and whose amino acid sequence is markedly different from those encoded by A and B.

Primates and humans took different branches on the tree of evolution millions of years ago but share blood types – which is to say evolution both found a way and saw fit to retain all three variants in so many species for a very long amount of time. Scientists don't yet have a simple answer to why evolution has done this, but they aren't complaining.

(D.P. Kasbekar is a retired scientist. kasbekardp@yahoo.co.in)

THE GIST

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Youth power will make India a developed nation, says Modi

He advises younger generation to step out of comfort zone, take risks and lists steps taken to empower them; addressing Viksit Bharat Young Leaders Dialogue, PM says goal of developed India by 2047 requires daily targets and consistent efforts

The Hindu Bureau
NEW DELHI

P rime Minister Narendra Modi on Sunday said the youth would drive progress and make India a developed nation. Setting big goals and achieving them within a time frame was not impossible, and the country was working with that mindset, he said.

Addressing the Viksit Bharat Young Leaders Dialogue, 2025, held on the occasion of National Youth Day, Mr. Modi said the goal of a developed India by 2047 required daily targets and consistent efforts.

He advised the youth to step out of their comfort zones and take risks, as demonstrated by the participants of the Young Leaders Dialogue. He reiterated his commitment to bringing one lakh young people into politics.

PM's vision

Sharing his vision, Mr. Modi said that in a developed India, both economy and ecology would flourish, and the country would have the world's largest skilled youth workforce.

"Global agencies recognise the youth's potential



Engaging the next generation: Prime Minister Narendra Modi interacting with a participant during his visit to an exhibition at the Viksit Bharat Young Leaders Dialogue in New Delhi on Sunday. ANI

to significantly boost India's GDP," he said, noting that the Indian youth were leading major global companies. He said the next 25 years – the "Amrit Kaal" – were crucial, and expressed confidence that the youth would realise the dream of a developed India.

On the steps taken by the government to empower them, Mr. Modi said every week a new university and every day a new ITI was being established,

while every third day an Atal Tinkering Lab was opened and two new colleges were established daily. India now had 23 IITs, and in the past decade, the number of IIITs had increased to 25 from nine, while the number of IIMs had risen to 21 from 13. There was a three-fold increase in the number of AIIMS and near doubling of medical colleges in the past decade. The number of higher education institutes in the QS rankings

had risen to 46 from nine in 2014, he said.

He acknowledged that while the goal of a developed India was significant, it was not impossible.

Overcoming crisis

Citing the example of the economic crisis in the United States in the 1930s, Mr. Modi said the Americans chose the "New Deal" and not only overcame the crisis but also accelerated their development. Singapore, which faced basic life

crises, transformed into a global financial and trade hub through discipline and collective effort. India also had similar examples, such as the freedom struggle and overcoming the food crisis post-Independence.

About India's commitment to green energy, Mr. Modi said India was the first country to meet the Paris Agreement commitments nine years ahead of schedule. He said the country was set to achieve the target of 20% ethanol blending in petrol well before the deadline of 2030.

While highlighting the ambitious goal of hosting the Olympics in the next decade, he said India was making rapid strides as a space power, with plans to establish a space station by 2035. He said achieving such goals would pave the way for a developed India by 2047.

He also interacted with youth at an exhibition and witnessed their innovative ideas. He saw 10 presentations on topics ranging from sustainable development and manufacturing to integrating technology with agriculture. Around 3,000 young leaders from across the country participated in the event.



Docking trial: ISRO overcomes drift, nudges satellites closer

By bringing Chaser and Target within three metres of each other before moving them to a safe distance, the agency has overcome last week's setback caused by an unexpected drift; docking will be done after analysing trial data, says the agency

The Hindu Bureau
BENGALURU

Trying to dock two satellites in space for the first time, the Indian Space Research Organisation announced early on Sunday that they were brought within three metres of each other in a trial attempt. It then moved them back to a safe distance.

"SpaDeX Docking Update: A trial attempt to reach up to 15m and further to 3m is done. Moving back spacecraft to safe distance. The docking process will be done after analysing data further," the space agency posted on X.

An important project of the ISRO, the SPaDeX mission was designed to develop and demonstrate the technology needed for spa-



A PSLV C60 rocket had carried the satellites to space on December 30. PTI

cecraft rendezvous, docking and undocking using two small satellites.

A PSLV C60 rocket carried them – SDX01 (Chaser) and SDX02 (Target) – to space from the Satish Dhawan Space Centre in Sriha-

rikota on December 30.

Earlier on Sunday, the ISRO said the two satellites were within 15 metres of each other. "SpaDeX Docking Update: At 15m we see each other clearer and clearer, we are just 50 feet

away for an exciting handshake," the agency posted. It released photos and videos of the two satellites.

With this, the ISRO has overcome the setback last week due to an unexpected drift between the satel-

lites, resulting in the postponement of the docking experiment.

Roadblocks averted

On January 8, hours before the experiment was to be carried out, the agency announced its postponement as the drift was more than expected. It later arrested the drift. The docking was initially scheduled for January 7.

The demonstration of this technology is essential for futuristic missions such as sending an Indian astronaut to the moon, sample return from the moon, and the building and operation of an Indian space station.

If the ISRO successfully executes the docking experiment, India will become the fourth country after the U.S., Russia and China to accomplish the feat.

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