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SMART WATER

CYBER FORTLINESS

ONCD EXPLAINED

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AI-Driven Borders Surveillance

How India is Using Advanced Tech to Watch to Monitor the Line of Control

Anvitha NJ, TechSphere Insights,
May 2025, Volume 1, Issue 5, pp. 4–9.

Introduction

India is a wide country with a variety of land types, including rivers, forests, deserts, and even snow-capped mountains. The borders are long and difficult to keep track of as a result. The Line of Control between India and Pakistan is one of the most dangerous borders. This has always been a complicated area. Even though the weather is terrible and their lives are extremely difficult, Indian soldiers have been protecting us here for many years. But now, things are changing. With the help of technology, especially something called Artificial Intelligence (AI), India is improving the way it guards the border. As a student from this generation, I always assumed that artificial intelligence was limited to apps or mobile devices. However, I was shocked to learn that it’s also being used to support our troops at the borders. I became more interested and wanted to learn more as a result. That's when I started reading about it. I'm writing this article to share what I learned and how this technology may affect our country's safety in the future, because I found it to be fascinating.

Why Are Borders Difficult to Protect?

It is difficult to protect India's borders. Particularly in Jammu and Kashmir along the Line of Control, the terrain is forested, hilly, and snowy. Attempts to cross the border illegally are also common, and sometimes there are even assaults. The army has always been there to put an end to all of this, despite its numerous problems.. It's dangerous, chilly, and dark. While standard methods like installing watch towers, sending soldiers around, or erecting fences are helpful, they are no longer sufficient. Artificial Intelligence (AI) is being used in conjunction with new tools.

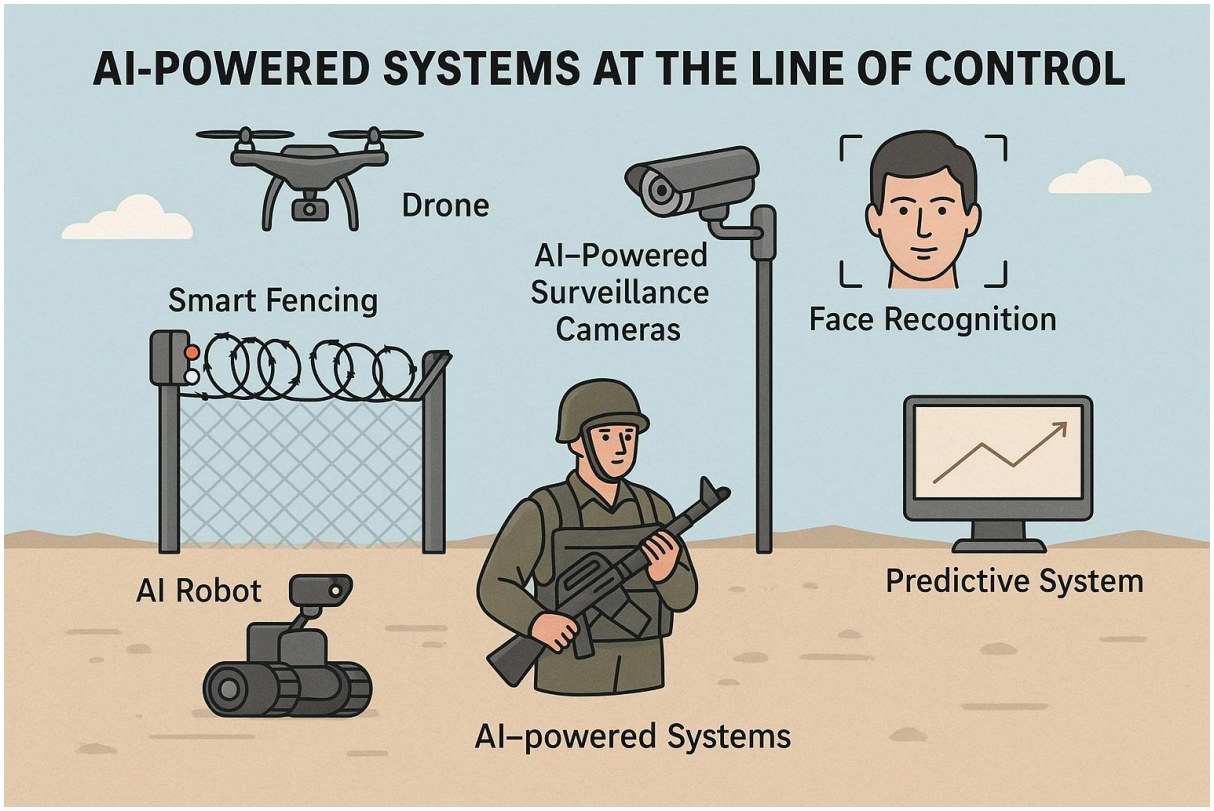
What is AI, and Why Is It Useful Here?

Artificial Intelligence (AI) is essentially the ability of machines or computers to think and act like humans. For example, AI can identify a person in a picture or understand possible outcomes by studying patterns. At the border, AI is being used to monitor large areas all the time, recognize faces, detect movement even in dim light or fog, and guess when or where someone might try to cross. If something unusual happens, AI can quickly send an alert to the soldiers. This doesn't mean that AI is taking the place of soldiers, but it is being used as a tool to help them do their jobs more effectively and safely.

AI Resources Used at the LoC

- Smart Fencing (CIBMS) - Uses thermal cameras, sensors, and alarms to spot movement.
- Drones (UAVs) - Fly over rough terrain and send live video to the base.
- Smart Surveillance Cameras - Detect heat and motion, even in low light or fog.

- Face Recognition Software - Matches faces with criminal records to find suspects.
- AI Robots - Small robots with cameras used in dangerous areas.
- Predictive Systems - Study old data to guess where problems might happen.



Advantages of AI at the LoC

- Works 24/7 – Never gets tired, active day and night.
- Fast Alerts – Sends quick notifications for action.
- Protects Soldiers – Robots and drones take the lead in risky zones.
- Weather-Resistant – Functions in snow, fog, and darkness.
- Covers More Ground – Monitors wider areas than humans can.

Challenges of Using AI

- High Cost – Expensive to install and maintain.
- Needs Power & Network – May not work well in remote zones.
- Cyber Risk – Needs strong protection from hacking.
- Training Needed – Soldiers must learn to use the tech.
- Weather Limits – Can be affected by heavy snow or storms.

What Kind of Tech Is India Using at the LoCsSW?

To protect the borders, India has started using many new AI-based technologies like smart fencing, also called CIBMS, which is a digital fence with cameras, sensors, and heat detectors that send a message to the control room if someone tries to cross. Another technology is drones or UAVs, which are small flying machines that take pictures and videos of the border area and, with the help of AI can even follow moving objects, making them useful in places that are hard for people to reach. Smart cameras are also used, and they can work in the dark or fog because they detect heat; AI helps them understand whether the movement is from a person or just an animal. Face recognition checks a person's face with a criminal list if they try to enter, helping catch known criminals. In risky areas, small robots with cameras and sensors are sent that can move around safely, avoid things like rocks or trees, and send back videos or sounds with the help of AI. Prediction systems use old data like when and where someone tried to cross before, and guess when it might happen again, so soldiers can be ready in advance.

How Does This Help the Army?

The use of AI has many benefits. To begin with, these machines never tire. They can continue to watch around the clock. AI quickly notifies the soldiers so they can take appropriate action if something odd occurs. Time and possibly even lives are saved in this way. Additionally, soldiers don't always have to put themselves in risky situations when drones or robots are used in hazardous areas. The sensors and smart tools don't get tired or confused, and they can sometimes be more accurate than human eyes. Because fewer workers are required to complete the work, this technology saves money over time even though it initially costs a lot to set up.

What Are the Problems with Using AI at the Border?

Even though AI sounds really cool, it's not perfect. First, things like drones and smart fences are very expensive. That's why they can't be used on every part of the border right now.

Also, machines can make mistakes. For example, if there's fog or snow, the cameras and sensors might not work properly.

Another problem is hacking. Since these tools use computers, someone from outside could break in, stop the system, or steal important information. That's a big risk.

And finally, soldiers have to learn how to use all this new technology. Learning takes time, and not everyone finds it easy. But the good thing is that India is trying to fix all these problems.

What Is the Government Doing?

The Defence Research and Development Organization (DRDO) and the Indian government are working to make sure that India develops its own artificial intelligence (AI) tools. As part of the "Make in India" movement, Indian businesses are producing sensors, software, and intelligent drones. This lessens our reliance on foreign technology.

Some of these AI tools were successfully tested and placed on the Jammu and Kashmir border in 2023. The army now intends to use them anywhere else as well because of how well they worked.

Why This Matters to Me as a Student?

As someone who's studying now, it really surprised me to know that the same kind of technology used in social media filters or games is also being used to protect our country. It makes me feel proud and also curious. Maybe in the future, students like me can be part of building these tools. Fashion Communication may be about design and stories, but stories like these show how powerful tech and teamwork can be.

Conclusion

For India, using AI at the LoC is a significant step. It makes our soldiers safer and more productive. AI is typically used in phones and video games, but it is now also being used at the border. Although there are still some issues, India is making efforts to resolve them. This piqued my interest as a student. It demonstrates how technology and people can cooperate to safeguard our nation.

AI in Courts

Can Machine Learning Help Solve India's Judicial Backlog?

Mahak Bakliwal, TechSphere Insights,
May 2025, Volume 1, Issue 5, pp. 10–15.

Introduction: When Justice takes decades

"Had I known it would take more than two decades even to get bare minimum justice, I don't think I would have gone to court." These lyrics capture the anguish and heartbreak of Neelam Krishnamoorthy, who lost both of her children in the 1997 devastating fire at a Delhi movie theatre that killed 59 people. By that time, four of the 16 persons convicted had already passed away, and her tenacious pursuit of justice had lasted for twenty years. In the same way, a court in Firozabad sentenced a man aged 90 to life in prison in May 2023 over his role in the murder of ten Dalits in the village of Sadhupur. This crime was committed 42 years ago. He was the last surviving accused; others had already passed away during the long trial.

You might be wondering; how did these cases take years to get resolved? That's because these stories showcase a powerful example of India's judicial backlog- the massive pile-up of unresolved cases. In simpler terms, it refers to crores of pending cases that remain unresolved for years, often causing justice to be delayed or denied. These court delays are significant and go beyond just statistics. For a long time, someone decided to invest all their time and cash in a lengthy property case. Litigation is eating away at both the day-to-day activities of a small business and the trust its staff has in management. Every period they are detained means one day less outside. Over 5 crores cases are pending in Indian courts on this never-ending backlog, according to the National Judicial Data Grid.

There are many reasons for this, such as:

- Too few judges for our massive population,
- frequent adjournments that repeatedly postpone justice,
- painfully slow manual systems still reliant on paper,
- and many outdated documentation practices.

Such problems mean Ms. Krishnamoorthy must endure more pain and weaken the faith people have in the justice system. Left unanswered, justice still hurts, not as much as outright injustice, but the hurt is never quite gone. But is there a way to clear this massive backlog and speed up justice?

One promising answer lies in technology, specifically Machine learning (ML), which is a subset of Artificial Intelligence. Think about how Netflix recommends shows you might like based on your watch history, just like ML can suggest relevant case laws by learning from patterns in legal data. At its heart, machine learning is the process by which computers automatically learn from data patterns to make judgments or predictions. It's where ML can be utilised in the legal world, not by replacing humans, but by complementing them to work smarter and faster.

Where does Machine Learning come in?

1. Legal Research Assistance

Finding the right case law can feel like searching for a needle in a haystack. It takes a lot of time to comb through files, and even then, something crucial might slip through. ML-driven software can quickly scan through thousands of laws, judgments and statutes to identify relevant case laws and precedents. It could save the lawyers and judges hours of manual scrutiny and enable them to prepare quickly and make well-informed decisions sooner.

2. Case prioritisation and categorisation

Not all cases are extremely urgent, but our system would handle them all the same. ML can turn this around by analysing past data to figure out urgent matters, like cases involving senior citizens or personal liberty, and sort cases based on type and complexity. For example, a Bengaluru-based NGO, DAKSH works with courts to examine delays with the assistance of ML and data

analytics. Its findings help suggest reforms, showing how tech can guide courts to act faster and more fairly.

3. Summarising complex documents

Most legal documents are found to be lengthy and filled with complex jargon. Lawyers and judges spend hours- sometimes days- just reading them. ML tools, especially those using Natural Language Processing (NLP), can help summarise these texts, highlighting the key points. This can help lawyers, judges, and parties quickly grasp the essential details without reading the entire document.

4. Improving Public access and transparency

For most people, stepping into the legal system feels like falling into a maze. You file a case, and suddenly everything goes quiet and infrequent updates about your case are made. But imagine if courts had online systems that could show real-time updates, hearing dates, and how long a case might take. It could be like simply tracking where your online order is. This kind of access would help people from making endless calls or numerous visits to the courts, and could help them clear up confusion and provide accountability.

5. Automated Document Classification and Management

Courts process millions of legal documents- affidavits, petitions, judgments, and so on. Today, most of these documents get sorted manually, which becomes very cumbersome. ML can help in classifying these documents automatically, sorting them by content and relevance. This would minimise the time clerks and lawyers spend on manual filing and searching, and accelerate the case proceedings. A prime example is the Telangana High Court's e-filing 3.0 portal

for online submission of legal documents. This transition helps save paper and human error, setting the stage for ML tools to operate efficiently.

6. Transcription and translation

Courtrooms can be daunting, even more so when you're not familiar with the language used. In India's multilingual judicial system, this is an everyday challenge. ML models can be of help as they can be created for speech-to-text transcription of court proceedings. They could also help in the translation of judgments across languages, which could help in increasing accessibility.

ML in Action.

The good news is that we have already started along this route. A significant step toward inclusive justice is being made possible by the Supreme Court's SUVAS (Supreme Court Vidhik Anuvaad Software), a machine learning-powered translation technology that makes rulings available to individuals in their native tongue. This has made it possible for a farmer in

rural Maharashtra to read a Supreme Court ruling in Marathi rather than having to struggle with English. SUPACE (Supreme Court Portal for Assistance in Court Efficiency) is another such instrument. Established under the direction of former Chief Justice of India S.A. Bobde, SUPACE compiles pertinent laws and data and presents them in an understandable manner. Instead of making choices, it calculates information to help judges make decisions and reduce their effort.

ML might be impressive, but it can't do everything. It's very true- change isn't always easy. Even now, courts often stick to using paper for their records and resist trying other ways. Until we put these systems online, the best ML tools

cannot achieve much. Quality problems with data also cause big issues. Many documents from court cases are written by hand and very often incomplete, without any online records. Even advanced technology is troubled by gaps and messes in data. Hence, we would need to clean up the data if we want ML to assist us. A future-ready system can only be built when we have the speed and transparency needed for justice.

Conclusion

If we do not speed up, it will be 300 years before we remove all the problems waiting to be tackled. That means justice was delayed for 300 years- longer than India has been a nation. Rather than eliminating human judges, machine learning will allow judges to focus more on their job of meting out justice. Getting this right helps us work more quickly, gains the trust of the community and offers hope to individuals waiting for justice. This is a future that we have reason to pursue.

Technology is available for us. Things are happening so fast that change is necessary. Now we have to ask if we can act fast enough to keep the system as swift as justice calls for.

Astrology Meets AI

The Rise of Algorithmic Horoscopes in India's Wellness Tech Boom

Aranya Ghosh, TechSphere Insights,
May 2025, Volume 1, Issue 5, pp. 16–19.

Introduction to Astrology and Horoscopes

Astrology is an ancient practice that links human terrestrial life with the movement of celestial objects. The study of astrology involves creating charts called horoscopes. These are personalised astrological interpretations based on the positions of planets, the sun and the moon during birth. Based on the birth time, these charts are divided into twelve zodiac signs and are said to reveal a person's personality, career and even future events.

The ever-evolving curious nature of humans intrigued them to trace the celestial movements from time immemorial. Humans studied and understood the patterns of constellations and related their movement to their lives. The origin of astrology can be traced back to the millennials. Ancient

Mesopotamians, Egyptians, Indians, Chinese and Greeks developed elaborate astronomical systems, each with its unique approach. The first form of astrology was developed in Mesopotamia around 1800 BCE. In Indian society, Jyotish Shastra has significance in religious and cultural traditions even today. Horoscope influences life decisions like marriage, career choices and even the names of newborns.

Algorithmic Horoscope

With the rise of technology, the ancient art of astrology has been modernised. Algorithmic horoscopes powered by artificial intelligence and machine learning have changed the way people access and use astrology. This age-old knowledge, previously accessible to only a very few, is now available at the fingertips of millions. Mobile applications powered by machine learning algorithms take user data along with complex astronomical information, real-time planetary movements and zodiac signs to give accurate predictions. Moreover, these applications are accessible in vernacular languages to cater to the demands of the rural population. Algorithmic horoscope enjoys good feedback from users because of its accuracy, remote access and fast predictions. AI-powered astrological wearables help people make decisions in their day-to-day lives based on planetary movements. A report by Maia Research reveals that the global astrology app was valued at 3.94 billion USD in 2024 and is projected to reach 9.91 billion USD by 2029. This reflects the demand and popularity of algorithmic horoscopes among people, especially tech-savvy young generations.

Some popular AI-powered Algorithmic Horoscopes

- AstroSage- AstroSage is one of India's most popular astrology apps. It combines traditional Vedic astrology with AI to provide personalised daily horoscopes, birth chart readings and marriage compatibility analysis.
- Astrotalk- Astrotalk integrates AI prediction with human experience by connecting users to astrologers. The reliable predictions and detailed consultation make it popular among users.
- Co-Star- Co-Star is a globally recognised astrology app that uses Artificial Intelligence and NASA's accurate planetary data to create personalised horoscopes.

- The Pattern- The Pattern is a USA-based application that combines AI and psychological understandings to provide a unique blend of astrology and personality analysis. Its in-depth readings focus on emotional patterns, offering a holistic approach towards a better life.
- Clickastro- Clickastro uses AI to generate detailed and accurate horoscopes and personalised predictions. It offers users insights on health, finance, and career with a user-friendly interface.

The Role of AI and NLP

Artificial Intelligence plays a crucial role in the development of Algorithmic Horoscope software. This software uses sophisticated Machine learning models to give outputs using user data. Instead of being explicitly programmed, AI models train using huge datasets to find patterns and learn from training data to give correct predictions. These AI models use an unsupervised learning algorithm. Thus, the prediction gets more accurate and reliable over time with the input of more and more data. Natural Language processing, another domain of AI, is used to interpret inputs in human language and give outputs in a user-friendly way. Data visualisation, a part of data science, is also used to represent outputs in charts, graphs and visuals of planetary movement.

For example, when the user inputs their birth details, time, and place into the app, the artificially intelligent software maps the planetary positions and uses astrological principles to give some output. The input given by the user gets stored as user data and is used to give better results the next time. Natural language Processing or NLP ensures that the output result is comprehensible, visually appealing and engaging. Algorithmic Horoscope works better on hyper-personalisation. This involves giving a tailored and personalised experience to users using previous behavioural patterns. This personalisation has made the algorithmic horoscope more user-friendly and appealing to younger generations.

Advantages and Limitations

Algorithmic horoscopes offer several advantages over traditional astrology. They provide astrological insights instantly without the need for physical

appointments with traditional astrologists. Their cost-effectiveness and scalability make it easily available to millions of people. The use of Artificial Intelligence ensures accuracy, and the astronomical prediction gets better with every use as the system learns from user interaction. AI-powered horoscopes can be highly customised based on the unique needs of the user. A survey conducted in 2023 reveals that almost 47% of the surveyed people prefer an algorithmic horoscope over traditional ones.

While predictions made by AI-powered horoscopes are mostly correct, they also have some limitations. The effectiveness of the model depends on the quality of the training data used. Moreover, there might be ethical concerns about the use of personal data like birth details. Unlike human astrologists who often use intuition and experience to give philosophical guidance, AI software adheres to fixed rules and thus often fails to make the user feel satisfied.

Algorithmic Horoscope and India's Wellness Technology

With advancements in technology, India's wellness sector is also getting modernised and up-to-date with the latest technology. Age-old studies like astronomy are no longer inaccessible. Digitalisation has given rise to algorithmic horoscopes, which are driven by artificial intelligence. Once limited to hand-made charts and face-to-face consultations, astrology is now easily available on smartphones.

The fusion of tradition and technology has catered to the demands of millions of Indians. India's younger generation has been a key contributor to the development and adaptation of wellness technology. Platforms like AstroTalk, ClickAstro, and AstroSage not only provide horoscopes but also integrate astrology with other wellness features, like stress management, growing rapidly, with the algorithmic horoscope apps playing a major role.

Cyber Frontlines

How India is Fortifying Its Digital Borders Amid Cross-Border Tensions

Aryaman Mann, TechSphere Insights,
May 2025, Volume 1, Issue 5, pp. 20–23.

As the world becomes increasingly interconnected, cyber threats have risen sharply, and countries have begun to consider cyberspace among the key domains of conflict. Especially in South Asia, the trend is clear: the cyberattacks spike with land or maritime tensions. The clash in the Galwan Valley in June 2020 is a prime example of the same. One security firm reported a 300% increase in Chinese cyber intrusions targeting Indian networks during that time. Similarly, whenever skirmishes with Pakistan intensified, India's Cyber Emergency Response Team (CERT-In) reported an increase in ransomware, DDoS, and malware attacks on government and business systems. As such, India has started to view its online infrastructure as a new and crucial border that needs to be protected. This means that India is now openly talking about tightening its digital sovereignty to ensure national security in the ever-developing world.

Groundwork

India's initial investment in cybersecurity started more than a decade ago. The Information Technology Act, 2000 (amended in 2008), laid the first legal groundwork against cybercrimes. In 2004, the government established the CERT-In as the national agency for incident response and security awareness. Over time, more institutional firewalls were built, like the National Cyber Security Policy that was released in 2013, and the National Critical Information Infrastructure Protection Centre (NCIIPC) was created in 2014 to secure important systems in the power and finance sectors.

But these measures weren't enough. In a report by India Today, it was revealed that around 1000 Indian government websites were hacked from 2009 to 2012. Not only that, but most of the attacks were on the heart of national security. Sensitive data from the Defence Research and Development Organisation (DRDO) network was leaked, and even the Prime Minister's Office website was infiltrated. Security experts warned that such incidents were the same as warfare and called for strengthened laws and measures, as well as international cooperation. In short, India had realised the real threat of cyber espionage by the mid-2010s.

Strengthening the Digital Border

From 2015 onwards, serious actions were taken for cyber defences in many pivotal areas. The government increased funding and attention for the same. For instance, the union budget 2023-2024 allocated ₹759 crores to cybersecurity projects and raised the CERT-In budget to ₹238 crores. Strategic initiatives were also taken. For example, India established the National Cyber Coordination Centre (NCCC) in 2017 to monitor internet traffic for any threats. Later, a National Cyber Security Coordinator was appointed to make the policies more efficient. CERT-in has been empowered by the government with mandatory reporting rules. Under recent changes, effective from 2022, all government telecom, cloud, and other critical service providers must report major incidents to CERT-In within hours and also maintain detailed activity logs.

Defensive infrastructures have also been strengthened, and special exercises have been formed to prepare for any future cyber conflicts. In October 2023, the National Security Council Secretariat organised a large-scale national cyber

exercise—the Bharat NCX 2023. It lasted for two weeks, and the “live-fire” drills brought together hundreds of participants to do simulation attacks on important information infrastructures. The exercise featured red-team versus blue-team war games and a CISO conclave with 200 top security officers. In order to address the ever-developing threats, Bharat NCX emphasised the necessity of thorough cyber strategies and tight public-private sector cooperation.

As the Chief of Air Staff has rightly said and highlighted that future battles might be fought in the digital realm, collaboration between stakeholders has become important and central to India’s approach. CERT-in routinely issues guidelines and alerts, one of the most recent being in early 2025, when it warned MSMEs about an increase in attacks due to India-Pakistan tensions. Memoranda of Understanding have been signed with many countries, including Singapore, Japan, South Korea, the United Kingdom, and more. This was done to exchange threat intelligence and best practices about the same. “Exercise Synergy” was hosted by CERT-In in September 2022 with Singapore’s Cyber Security Agency and 12 other countries, clearly emphasising the rise in international cooperation.

These initiatives are important, for it has been confirmed many times that cyber incursions have happened from state-linked adversaries. In April 2022, a media report detailed how Chinese-sponsored hackers had targeted seven regional electricity grid hubs near Ladakh, though these attempts were foiled. Security officials have continued to track active Pakistani and Chinese Advanced Persistent Threat (APT) groups trying to infiltrate and probe the Indian networks.

As such, strict actions have been taken. India has tightened its control over the cyber borders through various regulations and initiatives, for example, banning various Chinese apps like TikTok. One of the recent high-profile steps was the ban of several popular VPN apps, including Cloudflare’s 1.1.1.1, from Indian app stores. This was the first major implementation of a 2022 rule that clearly stated that VPN services are required to keep detailed user logs. While various industry and business groups disagreed with the changes, fearing security and privacy issues, it’s clear that the initiative reflects India’s drive for digital sovereignty. India's aim is transparent, that is, to maintain authority and safeguard encryption and data.

Looking Ahead

India is planning to have aggressive and ambitious upgrades to strengthen its digital borders even more. One essential point is the finalisation of a National Cyber Security Strategy, which has been repeatedly mentioned in recent policy discussions. The priority in such a strategy is to have a cohesive and unified vision for cyber defence, including legal structures and governance frameworks. At the Bharat NCX exercise, it was emphasised that transparent laws and public-private cooperation are crucial.

India is expected to use cutting-edge technologies for defence, including adopting AI and machine learning to automate attack detection and expanding Security Operations Centres (SOCs) for vital sectors. Not only that, but the government is also considering reforming cyber laws and updating the IT Act to battle the emerging challenges, which include financial internet crimes and stricter rules on the increasing social media misinformation propaganda.

The Finance Ministry has suggested that funding for cyber initiatives is likely to grow even further. Reportedly, plans are underway to set up more security training programs and research labs to lessen the dependency on imports. Cybersecurity will be integral to the vision of Secure India. Critical infrastructure protection will remain as one of the top priorities, as shown by India's aim to design strong networks for power, finance, telecom, and transport to battle various cyberattacks.

Besides the internal workings and changes, international cooperation will also shape India's digital border. India is reportedly negotiating detailed and dedicated agreements with partners, deepening bilateral and multilateral relations. In one of the recent reports, it's stated that India and Australia have begun talks on a "cyber pact" for faster data sharing and collaborative response to cyberattacks. There are many more such instances, which show that international cooperation is also on the high-priority list.

In summary, India's digital borders are being fortified through various sophisticated and diverse means, sharp policies and technology developments. The past decades have taught a brutal but eye-opening lesson to India; as such, the government has started to move aggressively to a greater, better, and stronger future. The new legal powers for CERT-In, bigger security budgets, international cooperation, and specialised exercises will ensure that India's crucial systems will remain secure in the constantly developing and contested cyberspace.

Digital Detox Apps on the Rise

Is India’s Tech Boom Creating a Burnout Generation?

Arushi Singh, TechSphere Insights,
May 2025, Volume 1, Issue 5, pp. 24–28.

India's transition into the digital world has been impressive. With more than 850 million internet subscribers in 2023 and projections indicating the figure will exceed 900 million as of 2025, the nation has become among the world's foremost digital powerhouses. The technological boom, driven by low-cost data plans like Jio, bulk sales of smartphones, and a proliferation of Indian apps and startups across lifestyle, social networking, ed-tech, and e-commerce, has changed Indians' way of living, working, and communicating as much as anything in history. But amidst all this online revolution, a quieter crisis is emerging in front of our generation- burnout.

Let's be honest: our screen time has gone into overdrive. What started as convenience gradually turned into compulsion. The average Indian spends over 7 hours online per day these days, and that figure goes through the roof for college students and work-from-home employees. A 2022 LinkedIn survey found that more than 65% of Indian professionals experienced greater stress and mental exhaustion compared to past years. A 2023 Deloitte report went one step further, stating that over 80% of Gen Z Indian respondents had felt burned

out in the previous twelve months. These figures aren't mere data; they are a very real, very tired lived reality that's becoming mainstream.

Burnout now isn't merely physical exhaustion or eye strain — it's emotional exhaustion, short attention spans, anxiety, disrupted sleep, and a near-robotic inability to disengage. Gen Z, in particular, has matured in an always-first world where distinctions between online and offline are almost meaningless. College students scroll continuously between online courses, deadlines, and social media with no break. Corporate employees are chained to work emails long after dinner. The always-on requirement is reaching a weight that cannot be borne. In this digital onslaught, the notion of stepping away, even for a few hours, sounds outlandish. That is where digital detox apps enter the scene — an intriguing (and slightly paradoxical) technology-facilitated solution to technology overload.

These applications try to regain users a feeling of agency. Applications such as Forest gamifies the concept of going offline — plant trees that grow the longer you remain away from your phone. Leaving the app a little too soon? The tree withers. Straightforward, yet psychologically powerful. One Sec, another widely used application, includes a 10-second wait before launching social apps, enough to halt compulsive checking. Then there are inbuilt features such as Android's Digital Wellbeing and iOS Screen Time, which allow users to monitor their screen behaviour and impose strict limits.

Surprisingly, Indian developers are cashing in on this requirement too. Apps such as YourHour and StayFree provide personalized phone usage reports, daily targets, and nice shaming (yes, they'll label you as a 'phone junkie' if the numbers are too high). It may sound harsh, but to many users, this dose of reality is just what they require. These programs are particularly popular among college students and young professionals — those individuals most knowledgeable about technology, yet most bogged down.

The psychology behind it is connected to the way our brains act in response to technology. Sites such as Instagram, YouTube, and Twitter are coded to hijack dopamine — the "feel good" hormone — with never-ending scrolls, notifications, likes, and shares. It's a feedback loop that does a trick on the brain, making us crave more despite being exhausted. A 2023 study in the Journal of Behavioral Addictions confirmed that almost 70% of Indian youth indicated symptoms of digital addiction, from anxiety when not near devices to being unable to stop looking at social media despite harmful consequences.

For most, detox transition began with a breaking point moment. Some found they hadn't communicated with their families well in days, some were left emotionally drained after hours of comparing lives on Instagram, and some simply found their sleep patterns torn apart beyond recognition. A 21-year-old Delhi design student said she cried when her screen time reached 10 hours a day — a full-time job's worth of scrolling. That was her wake-up call, and she started using Forest. She now confidently sports a complete virtual forest. A Bangalore software engineer admitted reading emails during his wedding ceremony—something he really regrets. Such incidents are not one-offs but reflect growing realization among Indians that our attention is being hijacked — and that it's reasonable to want it back.

It's also worth considering the cultural context. India's joint family systems, where many generations reside in the same house, frequently translates to juggling attention between members of the family and digital temptations. Add to that intense academic and professional competition, and you have a powerful combination for around-the-clock connectivity and stress. Indian students, under pressure to succeed, usually end up juggling online classes,

competitive exam study, and social media, all vying for their shrinking attention span. This overwhelm is not merely due to recreational usage — it is ingrained in how we study and work these days.

It's worth mentioning here that digital detox apps are useful but not a silver bullet. They can help, interrupt behaviours, and establish healthier habits, but they can't treat underlying mental illness or cultural work culture issues. They are best as part of an overall effort — one that incorporates boundaries, offline downtime, improved sleep, and ideally, therapy. Downloading an app alone won't change your life unless you're willing to shift the underlying behaviours that resulted in burnout in the first place.

But here's why this moment is particularly fascinating: for the first time, logging off is cool. What was once considered laziness is now being repositioned as self-respect. Offline activities such as journaling, painting, reading physical books, or having solo café dates are not only becoming acceptable, but aspirational. And in some sense, anti-hustle culture is on the rise, particularly among Gen Z. There is increasingly the idea that one can't or shouldn't live life at 5x speed constantly.

This wave also gets a distinct Indian flavour. While the West gushes about digital fasts and off-the-grid escapes, India is experiencing an increase in tech-wellness fusion. Apps such as Sattva and InnerHour are fusing yoga, meditation, and mindfulness with clean UX and data analysis. Families, too, are (sometimes aggressively) resisting over-screening, and numerous colleges have implemented no-phone areas and quiet hours. The dialogue on digital health is shifting from "just log off" to a more complex, holistic mind-set based on balance.

Another significant change is occurring in rural India, where campaigns for digital literacy are now being complemented with awareness drives for healthy usage. NGOs and schools are now not only teaching people how to use technology, but also when not to. This mindful approach towards avoiding burnout is necessary as India's next billion users become netizens. If burnout has

already taken hold among urban youngsters, it's imperative that rural folks don't step into the same pitfall blind.

What can you do today? Perhaps you don't delete Instagram today — but you can begin tracking your time. You can place your phone on the table during meals. Try an app like Forest or StayFree to detox. Or even less: simply go outside phone-less for 20 minutes. The goal is not perfection. It's awareness. It's taking back even a sliver of your mental space.

Make a point to block out tech-free time in your schedule — say, 9 PM to 10 PM for unwinding screen-free. Read a book. Journal each night as a ritual. Call a buddy rather than shoot them a meme. Take a walk with no music or podcast. These little habits, as corny as they might sound, give your brain room to breathe in ways algorithms just can't.

In a time when your attention is currency, to log off — even for a moment — is an act of rebellion. So here's your permission slip, just in case you needed it: It is okay to silence your phone. It is okay to rest. It is okay to miss a meme or two. You are more than your notifications.

Breathe. Log off. The internet will wait.

Facial recognition in India

Convenience, Safety, or Civil Rights Crisis

Banisetti Sravya, TechSphere Insights,
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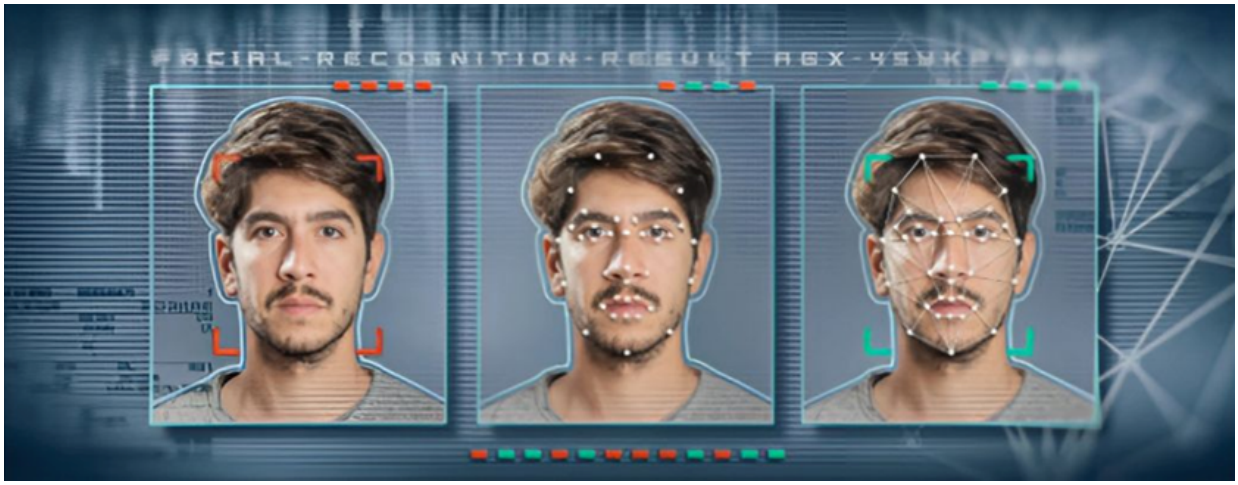

Facial Recognition Technology (FRT) is swiftly becoming a crucial component of India's digital transformation. It examines distinct facial characteristics to recognize individuals, converting these features into biometric data that operates similarly to fingerprints. India has commenced the deployment of this technology in over 170 facial recognition projects, of which 20 are currently operational. These projects include the various sectors such as defense (20%), education (13%), energy (12%) and public infrastructure (10%). Based on the level of adoption, societal and operational impact, FRT in India is broadly classified into major and minor sectors, which include the government, private, and public sectors. Major sectors are driven by law enforcement, transportation, public surveillance, and digital governance, where adoption is widespread. In contrast to minor sectors, which are driven by education, healthcare, private sector, retail, and marketing, focused on convenience and automation, where adoption is emerging or experimental, with a smaller reach. This technology has both advantages as well as disadvantages, just like a coin has two sides. Let's take a closer look at its convenience, safety and civil rights crisis.

FRT allows fast and seamless access to devices, log in to banking apps, verify identity during online exams or video calls for a smoother experience. This ultimately reduces password fatigue. It also decreases risk of infection spread

by hands-free operation without the need to type, tap, swipe, or carry access cards. Many users appreciate the contactless nature of this technology, especially in a post-pandemic world where hygiene is a greater priority. Besides that, it is convenient in situations like driving, carrying groceries and wearing gloves. It also speeds up check-in processes at airports, events and hotels without showing any documents. This technology makes tracking attendance and working hours automatic, fast, and reliable, offering convenience in workplaces, schools and other environments. Employers and institutions can gain insights like identifying trends, improve scheduling and planning. It minimizes administrative burden by integrating easily with payroll systems which not only saves time but also lowers the human error. People suffering with medical issues like unconscious, elderly, non-verbal and language-limited can take the advantage of this contactless access system.

When it comes to safety aspect, Facial Recognition technology in India tries to implement safety environment to the people. This system, not only identifies the suspects but it can also send an instant alert to security teams. So it gives an added advantage for the police to track the suspects and criminals. Locating vulnerable groups like missing children, adults or disabled people is also possible in heavy crowds, aiding in preventing stampedes. Restricting the entry to sensitive areas like research labs, government offices, airports and defense zones has made easier. Unlike manual ID checks, facial recognition is so accurate that it limits mistakes that could bypass security. Apart from this, it also used in malls, metro stations, bus stations as an extra layer of security to prevent theft, harassment and vandalism. The advanced version of it can even support pattern recognition and behavior analysis. This integrated FRT along with AI CCTV, is widely deployed in high-risk areas or recurring threats based on previous incidents. The FRT plays a crucial role in post-incident tracking by accelerating integration, aids in forensic analysis and supports law enforcement in reconstructing events. Part of national initiatives like Nirbhaya Fund projects and Smart cities mission have come into limelight. Courts also use this seamless technology for verifying identities during trials, arrests and investigations. FRT enables doorbells and cameras to restrict access to the entry of outsiders. This has come to existence in urban areas. In educational and corporate sectors, hacking and unauthorized logins are minimized by incorporating FRT in online banking, e-learning platforms etc. Airports like Delhi, Bengaluru, Hyderabad and Varanasi have started implementing Digi Yatra for airport and passenger security. In e-voting platforms or at physical polling

stations, facial technology helps to identify voter identity, ensures tamper-proof elections by prevention impersonation and duplicate voting. Now-a days schools are getting optimized to make sure safer child pick-up in schools. Some smart cars use it to recognize the driver and to prevent theft. Even in e-commerce and retail sector, its used for both secure delivery systems and e-commerce warehouses. In order to provide the safety for the nation, india's integrated check posts (ICPs) and major border crossings have also started. It has extended its role in medical field as well. Identifying genetic disorders could help in early diagnosis and better treatment outcomes.

While the facial technology offers convenience and safety to the people, it is equally important to explore the darker side of it as well i.e., its impact on civil rights. The most commonly faced issue is mass surveillance without consent. Right to privacy recognized by supreme court in 2017 was violated. Lack of legal framework regarding data collection, storage, or deletion is opening the doors for misuse, overreach and, or no accountability. According to some studies, this innovative technology can be biased towards minorities or marginalized groups, leading to religious, caste-based or regional profiling, which eventually leads to social injustice. Sometimes, facial recognition systems cause errors like misidentification of the innocents as suspects. FRT can be linked with Aadhar, CCTV, mobile numbers and also social media accounts. This enables mass profiling and prediction models, turning innocent civilians into datapoints for monitoring. Most facial scan systems like police use or smart city systems are implemented with little public disclosure. People don't even know who collects

the data and for how long it is stored and who it is shared with. This creates a dangerous lack of oversight. Also, the fear of being watched constantly may stop people from expressing opinions, threatens democratic rights like freedom of assembly and expression. Additionally, enforcement mechanisms are weak and exemptions for 'state security' are broad and vague. This allows government or private misuse without checks or redress. In malls, offices, schools and residential complexes, FRT is being adopted with no proper regulation. These systems can even sell the data violating privacy for profit. Even centralized databases are vulnerable to hacks or data breaches. India has seen multiple data leaks (like Aadhar), which raises concern about mass identity theft or fraud if Facial recognition databases are compromised. Digital Personal Data Protection Act (DPDP Act) is the India's first data protection Act which enacted in 2023 but still doesn't ensure data security and transparency.

To conclude, the facial recognition technology is powerful tool that holds immense promise with equal risks as well. As our faces becomes data points, the line between visibility and vulnerability blurs. It is not just about regulation but also about preserving the dignity and autonomy of every citizen. On the positive side, FRT helps in reducing wait time, streamline access and digital governance goals. It also strengthens public safety helping authorities detect threats and law enforcement operations. But the same technology deployed without proper safeguard, raises main concerns. So its outcome depends on how it is used. The unregulated, expanding use of FRT in india poses a serious threat to constitutional rights including Right to privacy (Article 21), Right to freedom of speech and expression (Article 19), Right to equality (Article 14). There is an urgent need for strong data protection laws, public transparency, regular audit and independent oversight. To move forward responsibly, India must ensure that technology serves the people, not watches them.

Love in the Time of Algorithms

How Dating Apps Are Rewriting Romance in Digital India

Neha Fatima, TechSphere Insights,
May 2025, Volume 1, Issue 5, pp. 33–38.

In India's teeming metros, swipes have replaced whispers, and algorithms have become the new matchmakers. Dating apps like Tinder, Bumble, Hinge, and TrulyMadly are reshaping the landscape of romance, offering urban youth greater autonomy over their love lives — but not without consequences. As swiping takes centre stage and digital chemistry replaces traditional courtship, India is quietly undergoing a transformation in how relationships are initiated, sustained, and often silently ended.

Previously tied to tradition, arranged marriages, and communal forces, Indian dating life is now undergoing a radical transformation, particularly among millennials and Gen Z. With the swift development of smartphones and internet

connectivity, online dating is more accessible than ever before. Such apps provide a guarantee of widened social circles, personal preferences, and a sense of agency that many young adults never had in matters of love. For many, particularly women and LGBTQ+ users, dating apps present a unique platform for self-expression, independence, and the chance for romantic freedom.

But this digital transformation is accompanied by a nuanced array of challenges. Shallowness flourishes in swipe culture, where initial impressions are derived from filtered selfies and clever bio-descriptions more than actual conversation. Emotional burnout, ghosting, and vulnerability anxiety are becoming the norm. Even more, data privacy issues, cyber-harassment, and societal stigma still plague the experience, especially for users outside liberal metropolitan bubbles.

Despite these problems, dating apps are unequivocally changing India's urban social landscape. They are not only transforming the way individuals meet, but also the way they conceptualise love, commitment, and compatibility. This article discovers how online dating is changing romance in India's cities—from the exhilaration of the first swipe to the isolation of unmatched expectations—and disentangles the more profound cultural, psychological, and social ramifications of falling in love in the algorithmic era.

1. The Urban Shift: From Rishtas to Right Swipes

The ongoing family and community-arranged marriage structures in India have shaped its dating culture. Traditionally, parents made attempts to locate suitable 'rishtas' through social interactions, community, and matrimonial listings. However, with the surge of dating apps in urban India, these arrangements have exposed space for a cultural shift with more young adults seemingly willing to explore relationships on their terms--so it is conceivable that the wideness of experiences or 'dating' is distinguished. Young adults are engaging in their subjective variety of compatibilities and personal selections instead of subscribing to restrictions. With metros like Mumbai, Delhi, Bangalore, and Hyderabad, it now requires a swipe right or left to explore potential romantic connections, as opposed to the lengthy meetings of moms and dads across the family arrangements to formalise a rishta.

This cultural shift is more pronounced for a more working-class population of millennials and Gen Z, who are willing to experience the agency dating apps provide as an individual system that allows them to find love on their terms, at a

time when dating was once taboo outside of arranged settings. The slow overall shift in emergence that meets with an increased fringe dating space through apps is an expectational conflict encountered by young adults as they can navigate new social orders, expectations, and nuances.

2. Inside the Algorithm: How Matches Are Made (and Marketed)

Each match on these dating apps is determined by a complex algorithm, which sifts through profiles based on preferences, geography, interests, and behavioural tracking. Dating apps leverage machine learning processes to predict which profiles are more likely to lead to successful matches, so naturally, many apps will also push users into more swiping and chatting.

On the other hand, these algorithms commoditise users of the app, transforming love into a game of numbers and judgments of appearance and quick decisions. The algorithms, ranked by images and more minimal bios, privilege facade over substance, creating the occasional faux connection, which may include human virtues that are simplistic and less compatible. Additionally, apps will earn revenue from aggregate user data, stirring the ethical dilemma of privacy and consent, in a nation where there are minimal data protection regulations.

3. Psychological Consequences

Nevertheless, with dating apps, you can have more opportunities, but with more opportunities come emotional problems. Users are faced with the paradox of choice and suffer from decision fatigue because there are simply too many choices, and it feels like an emotional struggle to "commit." Rejection and being ghosted do have a real effect on the mental health and self-esteem of users.

Research has indicated that exceptional dating app consumption can lead to feelings of loneliness and anxiety. State or urban respondents told us that even though they had hundreds of digital "connections" to select from, they weren't connected to anyone. The emotional impacts are an important issue, specifically as swiping continues to gain traction in Indian cities.

4. Dating in the Closet: LGBTQ+ Realities

For LGBTQ+ communities in India, dating apps are an uncommon and unique space for connection and self-expression, particularly in urbanised contexts as

acceptance expands. For instance, apps such as Grindr and OkCupid may result in finding a romantic partner but come with privacy issues and potential harassment, which may be intensified by existing discrimination against any non-heterosexual norms of a heteronormative society.

Although any criminalisation of homosexuality has been removed, modes of thought and stigmas still exist. In addition, while dating apps can be anonymous for a sense of thrill and safe confidentiality, anonymity can also be a frightening feature for the individual member. Nevertheless, the value of dating apps for visibility and unique connection with other LGBTQ+ members as they calculate and experience their risk is undeniable.

5. Small Towns, Big App-etite

Although the majority of dating app users are from metropolitan areas, smaller cities and tier-2 towns are quickly embracing these platforms. Increased smartphone usage and better internet connectivity have made online dating more accessible outside of metropolitan areas.

These young individuals frequently struggle to balance conventional standards with contemporary goals, which makes dating apps a place of refuge and conflict. Although these applications encourage self-reliance, they can cause problems with traditional family and social conventions.

6. When Algorithms Fail: Love, Lies, and Scams

Not everything that shines is gold in the realm of online romance. Because of the privacy and distance that apps offer, scams, catfishing, and dishonest behaviour have increased. Individuals have claimed financial fraud, emotional manipulation, and fraudulent profiles.

Such occurrences call into question user safety protocols, app accountability, and the necessity of more stringent regulation in the Indian context.

7. Success Stories & Still-Standing Stigmas

Many couples thank dating apps for connecting them despite obstacles, sharing tales of love that cut across national and cultural boundaries. The stigma associated with internet dating in India is progressively being lessened by these success stories.

Conservative groups and older generations, meanwhile, continue to be suspicious of app-based romance. Open communication, education, and awareness are necessary to close this gap.

8. Data Privacy and Ethical Concerns

The nuances of dating apps managing sensitive personal information cannot be sufficiently addressed by India's emerging data protection regime. Individuals often inadvertently share personal information that can be turned against them.

Apart from privacy, ethical issues also involve how algorithms can disproportionately affect marginalised individuals by perpetuating biases or discriminatory actions.

Conclusion: Rewiring Romance

The arrival of dating apps has forever changed the romance landscape in Indian cities and semi-cities. What was once a strongly familial endeavour based on community norms and established habits has been technologically re-engineered into a highly personalised, data-conscious experience. For India's youth, particularly in metros, love is now more within reach, heterogenous, and self-driven. They don't have to depend on family and friends anymore to meet

their potential partners; rather, with a couple of swipes, they can interact with potential matches from around cities, backgrounds, and belief systems.

This change, while liberating, also comes with a set of difficulties. The fantasy of limitless choice readily precipitates commitment phobia, shallow communication, and emotional exhaustion. The connections might be easy to establish, but keeping them in a digitally driven universe requires emotional intelligence, open communication, and sometimes resilience from the coldness of virtual relationships. Further, the same algorithms that increase exposure to potential mates might also perpetuate social biases, filter bubbles, and exclusion, particularly for marginalised users.

The two-way reality of dating apps—providing both freedom and friction—is most conspicuous in smaller cities and the LGBTQ+ community. For them, the apps are emancipating havens and points of vulnerability at the same time. Concerns such as fake accounts, scams, and the absence of regulatory cover keep user safety and trust under threat.

Ultimately, dating apps are not only revolutionising the way Indians fall in love—they're also transforming social norms around relationships, gender roles, and self-agency. As India's online love saga continues to play out, it requires more than mere innovation—it requires empathy, ethical regulation, sensitivity towards cultures, and effective data protection laws.

Romance in India is being reimagined not just by algorithms but also by the users who inhabit, form, and push back against these sites. It's a new story, one that holds great promise—so long as we read it with heart and prudence.

India's online romance story continues to be written — one swipe at a time.

Will ONDC rule over Amazon or Flipkart?

Tanushree Saha, TechSphere Insights,
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Will ONDC rule over Amazon or Flipkart?

ONDC (Open Network for Digital Commerce) is the new initiative launched by the government of India in 2021. The organization wants to help Indian e-commerce sellers succeed and improve. Since 2016, Amazon has consistently stayed in second place among India's e-commerce websites. According to position, Flipkart is the number one e-commerce site in India. The presence of imperfect competition in the highest level of the industry has influenced Indian e-commerce in different ways. The good side is that consumers loved the services, many of which were earned by selling or from affiliate programs. But the bad side is, the sellers have to give a very high commission to the duopoly.

There was no brand recognition, and full dependency on the platforms. With all these and many other e-commerce business problems, ONDC was launched. Let's understand how.

What is ONDC?

ONDC or Open Network for Digital Commerce aims to create an open-source network where buyers and sellers can connect and transact across multiple platforms, just like UPI can work on every digital payment app.

This initiative was launched by the Department for Promotion of Industry and Internal Trade (DPIIT) under the Ministry of Commerce and Industry of the Government of India.

The main motive of the government bodies is to unbundle the e-commerce ecosystem. This reduces the dependency on the platform, and the sellers can create their own brand identity, get customer data, and increase their market

share. There are a lot more advantages of ONDC that have revolutionized digital shopping.

What are the advantages of ONDC?

Any market operates on two main parties, one is the buyer and the other is the seller. The advantages of them don't attract, but they ripple. Let's start with the advantages of sellers. So if you're a seller, then stick to this page, and if you're a buyer, scroll down a bit, surprises are waiting for you.

What are the advantages of sellers from ONDC?

1) Lower commission fees

   In the big e-commerce platforms like Amazon and Flipkart, a seller has to pay a commission of around 45%. This commission rate increases the price of the product too high, in comparison to the offline Indian market. As a result, buyers disappeared, no sales push the seller down, where the algorithm is the main thing to get sales in the online platform. This demotivates a lot of the sellers.

   ONDC solves the commission problem of e-commerce platforms. The commission charge is too low in comparison to other digital shopping platforms. It's just about 5-10%. This will boost small businesses to operate digitally. This will contribute towards the growth of India.

2) No algorithm manipulation

   In many e-commerce platforms, the ranking system prevents the seller from taking a big leap to grow their business. In India, being a developing country, many businesses don't have the huge capital to invest in their business.

   The sellers who run ads with a high budget or those who have higher warehousing deals will get a higher rank on the search page on those e-commerce platforms.

   To solve this ranking problem of e-commerce platforms, ONDC has equalized the discovery of sellers. A local kirana store may appear beside a national branded company.

3) Direct access to customers

   The situation worsens day by day, initially the seller couldn't rank high, they spend a ton of money, they got customers, and when they try to leave the platform and bring the customers to their website, they couldn't because the biggest drawbacks of e-commerce platform like Amazon and Flipkart is that they don't let the sellers prepare their own customer database. Soon, they found themselves in the loop.

   ONDC helps to prepare the customer database. They support sellers in developing their own databases with permission from customers. This helps to promote the brand to a much advance level.

What are the advantages of buyers from ONDC?

1) More competitive pricing

   Here, the buyer can find the most affordable options for their wishlist. As sellers don't have to pay high commission to ONDC, they will offer the product at a fair price compared to the offline Indian market.

2) Hyperlocal discovery

   ONDC integrates local businesses like restaurants, grocery stores, pharmacies, etc, giving buyers access to nearby shops instead of warehouses far away.

3) Multiple app interfaces

   The buyer can shop from any ONDC-connected app. The choice isn't locked to any app or website.

How does ONDC work?

To understand how ONDC works in the simplest way, let's take an example.

1) You watched a commercial ad of a phone and you really like the phone
2) You decided to buy
3) Usually, you visit the e-commerce platforms like Amazon or Flipkart, but this time you open an app connected to ONDC, let's say PhonePe
4) There's an option named "pincode", when you enter there, a vast variety of items pop up on your screen

5) All types of sellers are there, like a mobile shop in Delhi, a seller from Bangalore, a brand like Samsung, and even a nearby electronic store.
6) After doom-scrolling, when you finally like the seller, you place the order
7) ONDC sends your order request to the seller
8) Seller pack the order and hand it over to the delivery partner
9) The delivery partner gives your phone into your hand
10) And it brings a smile to your pretty face.

This is the process how ONDC works. Now let's have a look at how many apps are connected with ONDC.

How many apps or websites are connected with ONDC?

If you're a buyer, these are the apps that are connected with ONDC to grab wonderful deals:

- Paytm
- PhonePe's Pincode
- Magicpin
- Craftsvilla
- Mystore
- Novopay
- NStore Technologies
- Spice Money
- NoBrokerHood
- Ola

If you're a seller, these are the apps that are connected with ONDC to buy raw materials at a cheaper rate:

- Snapdeal
- Meesho
- Bitsila
- GoFrugal

- GrowthFalcons
- Digiit
- UdyamWell
- EasyPay
- SellerApp

If you're a logistics provider, these are the apps that are connected with ONDC to ensure efficient product delivery:

- Delhivery
- Dunzo
- LoadShare
- Shiprocket
- Shadowfax
- Grab

If your favourite app is not listed here, then there is a gift waiting for you. Just read further.

Will ONDC break Amazon and Flipkart's monopoly?

ONDC was launched in 2021, Amazon came to India in 2013, and Flipkart started its operation in 2007.

It'd be wrong to say, ONDC will take over Amazon and Flipkart like big e-commerce platforms overnight. But eventually it'll definitely rule over those duopolies.

Why? Because ONDC is helps in the growth for the both buyer and seller. Moreover, ONDC is indirectly helping business to grow, making their own brand, expanding domestic market share before going for international market.

Another big question is when? It depends on various factors:

- Awareness and Marketing: The more ONDC promotes its brand, the more people will be aware that such an option exists, and the more quickly ONDC will rule over the duopoly.
- User Experience: Since it's a newly launched program, it needs a lot more improvement to make an easy, user-friendly experience.

- Volunteering or training: Since ONDC doesn't operate like an app or website, small businesses that are not tech-savvy require training to understand and avail the benefits, just like other government schemes.
- Building Brand: The customers who are loyal towards the brand identity of the big duopoly, require a solid reason to switch the alternative.

The day ONDC gain a solid catch in these areas, that day ONDC will break Amazon and Flipkart's monopoly.

A product that is made in India, for India.

Smart Cities 2.0

How India is Integrating IoT for Urban Sustainability

Shobana Somasundaram, TechSphere Insights,
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Introduction

India is one of the few nations that has shown an immense growth in technology and the Internet of Things (IoT). To increase the economy and to better the quality of living, the Government of India has come up with a project on June 25, 2015, called the Smart City 2.0 mission. The main motto of this mission is to enhance the country's IoT, a sensor that gives real-time data information, if it's mounted in a particular location or a city. The Ministry of Urban Development (MoUD) takes responsibility for executing this plan.

The Main Objective of the Smart City 2.0 Mission is:

- To develop the country's waste and sewage management
- To reduce traffic congestion
- To provide proper infrastructure
- To offer a pollution-free environment
- To ensure the safety and security of the data
- To digitize all the transactions for accountability and transparency.

How IoT can help in Smart City Development:

1) IoT in traffic management:

   IoT provides maximum advantage in the case of heavy traffic. The real-time data sensors detect traffic through regular surveillance and give proper information to the system so that there is no congestion among vehicles.

2) IoT in waste detection:

Digital sensors attached to bins help us to understand when they are empty and when they are full. So that at the right time, all the wastes are taken and kept for the next round of collection. With IoT, it is easier to help the public.

3) IoT in checking pollution:

   IoT helps in analysing the conditions of the air and its moisture level, thus helping in controlling pollution. A Pollution-free environment increases the quality of living for the people located in the particular area. IoT also helps in weather forecasting and its changes in patterns by giving informed details.

4) IoT in managing data security:

   The IoT sensors can easily detect any incoming or unknown ID that is trying to interrupt the system, thereby providing safety and security to the users.

5) IoT in infrastructures:

   IoT helps in constructing proper infrastructures such as buildings, roads, parks, dams, and malls in cities. They give proper monitoring of the land and the area so that the builders and architects understand the layout better and can construct proper structures.

6) IoT in Transactions:

   The digital transactions help monitor money transferring from one account to another, thereby giving account transparency.

Other importance of IoT:

1) Safety of people:

   It gives an alert to security forces if there is any unusual activity on the roads, thereby ensuring people's safety.

2) IoT in Fire Management:

   It alarms the fire service personnel if there is any fire outbreak in and around the city.

3) IoT in electricity usage:

   If the streetlight is damaged or if there is any electricity shortage and irregular power cuts in cities, they can be timely sensed by IoT devices.

4) IoT in Biometrics:

   IoT in biometrics can bring notice to organisational management in regards of employees' entry and exit in the buildings. For example, there is ZkTeco, which helps platforms like MinervaIoT integrate IoT in biometrics, thereby maintaining sensitive data.

5) IoT in disaster management:

   IoT installed in Surat helps caution the city if there is any storm or any natural disaster that may possibly occur in the city, so that the respective disaster management takes control of the situation and prevents damage from occurring in the city.

IoT and AI usage:

IoT collects data and information, and AI makes the best use of that data so that there is an improvement in the efficiency and sustainability.

Limitations to IoT Implementation

- With the number of people in the country comes the enormous amount of data. India is a country with a rich population, and therefore securing all the data is very complex and challenging. With data and information sharing each day, the MoUD should come up with a plan to protect private information.
- Installing IoT devices in cities requires proper signals and high bandwidth. Providing very small and basic facilities to some cities has been difficult so far. So, building such great infrastructure is a heavy task that takes lots of time and effort.
- Due to different policies in different states, there is no regulation. Due to the diversity of the regions, guidelines are different, and this has created discrepancies among the decision makers situated in different places.

Some smart cities in India

It is said that 63% of the country's GDP comes from the cities. The Smart City Mission has been implemented in some of the major cities in India to increase efficiency and to boost the country's economy. These cities are said to have overcome the challenges caused by IoT.

- Pune: Pune IoT systems navigate traffic and parking, and thus help people save fuel. IoT also supports electricity and sewage collection so that the respective authorities can effectively carry out their allotted responsibilities.
- Bengaluru: Bengaluru, also called the Silicon Valley of India, is one of the few cities to adopt Technology and has become famous for its IT hub. IoT-installed water management helps detect damage in pipelines. The city has also paved the way to provide internet connections to make life easier.
- Surat: IoT facility in Surat introduces an Integrated Command and Control Centre (ICCC) to regulate traffic flow in the city. It makes it possible to online check the water level. CCTV cameras around the cities provide proper surveillance of the city's safety. It also has an IoT system connected to disaster management.
- GIFT City (Gujarat International Finance Tec-City): This city is focused on creating a financial hub for the global market. It has provided solar panels for electricity, and facilitated ways to build green buildings, which leads to a pollution-free environment.

Scopes of IoTs

IoT has lots of potential to harness India's smart cities. IoT has to address all the challenges that are stopping it from further growth.

Routes and ways need to be found to compress the complex data. So that real-time information is gathered about a particular person, place, or any source of material.

Improvement is needed in terms of providing Wi-Fi with high bandwidth. IoT devices in weather forecasting and disaster management should be used in every city to protect residents from natural calamities.

More concentration is given to fasten the country's economy by improving efficiency and sustainability.

Conclusion

It is very clear that IoT can definitely help India in achieving its project Smart City 2.0. India's potency lies in the smart way of carrying out methods and the smarter execution of the project. IoT and AI can bring tremendous change in the country. As Indians, it is very important that we need to cooperate with the government policies and norms. Together, it is possible that we can make not just cities smart, but every nook and corner of the nation smart.

Smart Water

Can Tech Help India Survive Its Looming Water Crisis?

Tanushka Bhattacharya, TechSphere Insights,
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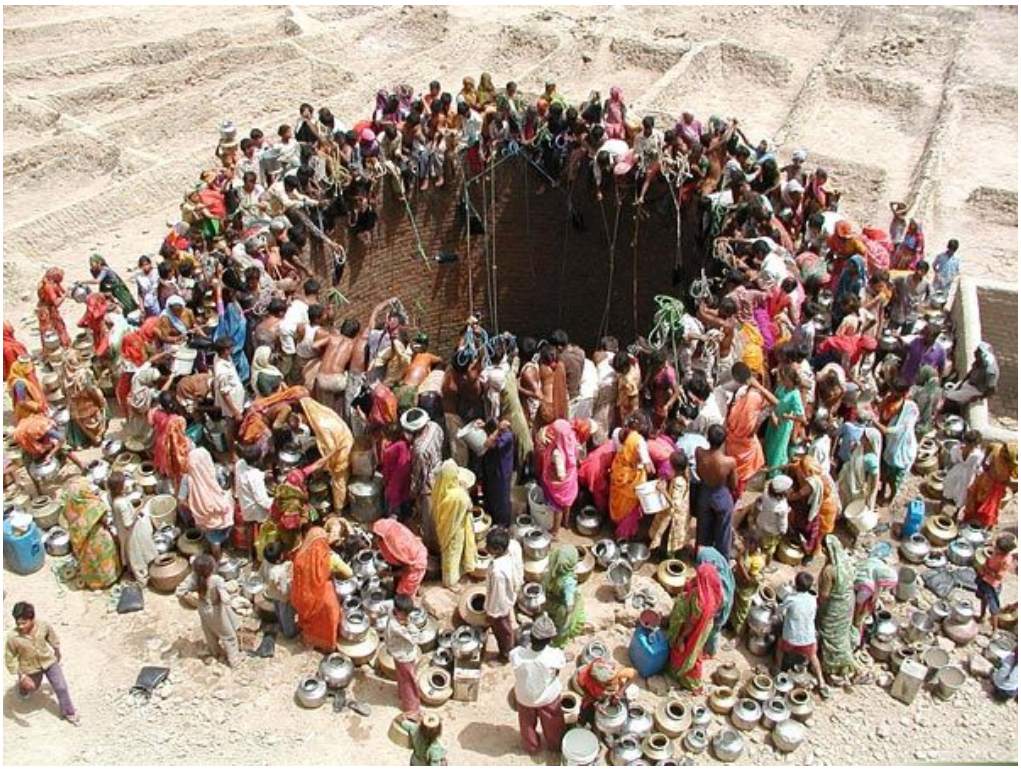

“Water, water, everywhere, but not a drop to drink.”

-Samuel Taylor Coleridge

Once a poetic line. Now, slowly turning into a terrifying truth. The recent case in India isn’t that it’s short on ideas. It’s short on water. And while the rain gods in the heavens above remain indifferent and politicians overpromise with every election, something else stands as our ray of hope. Technology Well, not exactly the sterile, corporate kind. However, that helps people in their times of desperate need. This is not a sci-fi pitch. This is the next big survival story, this time aimed at India.

A Nation Gasping for a Glass

India as a country holds about 18% of the world's population but only 4% of its freshwater, and now, we've hit DEFCON 1 on water. Cities like Bengaluru, Delhi, and Chennai are already facing what experts grimly call "Day Zero", the type of scenario where the day taps run dry. Rural areas depend almost entirely on groundwater, which is vanishing faster than we can imagine. And what's the bad news?

Climate change isn't a warning anymore, it's now the weather forecast.

Likely so, by the end of 2025, over 35 million Indians will lack access to safe drinking water. The Central Ground Water Board reports an alarming drop in aquifer levels across 70% of monitored wells. And climate models aren't pulling punches: more droughts, erratic rainfall,

and heatwaves are here to stay.

The Era Of Tech

This isn't really about putting an app on everything.

This is about having another helping hand in fixing our relationship with water. And what's gonna help with that?

Devices like IoT sensors, Drones, GIS mapping, AI dashboards &

Solar pumps with remote diagnostics. These are all coordinated under national missions like,

Jal Jeevan Mission (JJM), Smart Cities, PM-KUSUM, and AMRUT 2.0.

Here's How It All Functions:

1. IoT Sensors

Need help knowing if a pipe is leaking, buried under 2 meters of ground?

That is where the Internet of Things, or IoTcomes into the picture. These sensors now monitor water pressure, flow, and quality in real time. They send alerts the

moment something is off, whether it is a leak, contamination, or a complete water outage.

In places like Rajasthan, this technology helped reduce water loss by 27 per cent in trial zones. In Gujarat, illegal tapping at night was caught when the sensors flagged sudden drops in pressure. Based on the reports by the Department of Drinking Water and Sanitation, over 1.3 lakh IoT sensors have already been installed across Indian villages under the Jal Jeevan Mission.

2. Water Grid Mapping

Imagine Google Maps. But for your city's underground water network.

That's what GIS (Geographic Information Systems) is doing. These digital tools help identify leak-prone zones, improve pipeline layouts, and even predict flood pathways before disaster strikes. In Chennai, GIS mapping played a big role in creating a drainage plan after the city was hit by the devastating flood back in 2015. In the drought-prone district of Beed, Maharashtra, GIS tools have helped uncover underground aquifers that locals did not even know existed. And, with the help of AMRUT, India has now mapped water supply lines in over 260 cities. This makes maintenance more efficient and helps authorities make informed upgrades when needed.

3. Real-Time Analytics

Well, sensors collect data. Maps locate issues. So, who processes it all? The answer is Real-Time Analytics and AI. These go from predicting demand surges in summer to identifying water theft in slums, real-time data makes sure everything goes efficiently.

Startups like Vassar Labs, Fluid Robotics, and Netafim India use data dashboards to guide precision irrigation and pipeline management effectively.

Farmers now know exactly when and how much to water their crops. Some save up to 40% of water. The reports suggest, JJM's command-and-control dashboards now cover over 75,000 Gram Panchayats, ensuring smart oversight.

Agriculture: India's Biggest Water Guzzler

Unfortunately, 80% of India's water goes to farming. While 85% of rural drinking water comes from 30 million hand-pumped wells.

Farmers tapping borewells and villagers depending on monsoon-fed sources dominate the whole scenario across India. And, only 48% of urban water demand is met from groundwater, as cities rely more on piped supplies and reservoirs. But things are looking like they’re changing for the better because of technology.

Now, the Drip irrigation systems come with soil moisture sensors and timers that help deliver just the right amount of water to the crops. Meanwhile, Drones are being used to survey water-stressed crops and detect any problems around the area before it's too late. AI models are syncing irrigation with hyperlocal weather forecasts, so watering happens only when it should.

Startups like CultYvate, BharatRohan, and Fasal are helping farmers adopt smarter methods like Alternate Wetting and Drying in rice cultivation, which cuts water use by up to 30 per cent. Others promote Variable Rate Irrigation based on zone-specific data and crop-specific water demand modelling.

Government Schemes That Don't Just Sound Good, But Work

India's government is finally taking useful actions by initiating many large-scale schemes throughout the country.

The Jal Jeevan Mission (JJM) focuses on rural water supply by using affordable IoT sensors in villages. These devices track the flow, pressure, and groundwater levels, and send real-time alerts if something goes wrong, for example, sudden drops or outages. The Local Panchayats and engineers can now easily access this data through transparent dashboards, making water management more community-driven. The mission also runs a Field App and an IMIS Portal, which help log updates from over 20 crore households.

In urban spaces, the Smart Cities Mission and AMRUT are modernising water utilities. Through the integration of SCADA systems and IoT meters, cities are getting better at spotting leaks, automating water valves, and enabling smart billing. More than 500 smart water management projects have already been implemented. AMRUT 2.0 takes it further by requiring GIS mapping, 24/7 water supply, and integrated data systems across city networks.

Meanwhile, PM-KUSUM is transforming irrigation. It requires all solar pumps under the scheme to be equipped with IoT-based Remote Monitoring Systems (RMS). These systems track everything from pump health to solar power generation and water output, helping farmers plan better crop cycles and reduce overuse.

The Block On The Road

Although smart water technology seems promising, its widespread deployment in India still faces obstacles. The first major hurdle is cost. High-tech systems require high start-up investments, an outlay that most village budgets cannot afford unless it comes from government programmes or corporate social responsibility funds. Then comes the question of connection. The IoT sensors need power and a reliable internet to work effectively, still that is lacking in many areas of the rural belt. Solar-powered setups help, but delays and incorrectness still pose common problems when it comes to reporting on use.

With the infrastructure in place, technical capacity becomes an issue. So people don't yet see how to benefit from them, even though dashboards and real-time tools are very handy. Many panchayat members and utility staff still require training in tools like GIS and basic data interpretation. Public behaviour adds another layer of complexity. Water is still seen as a free, endless resource by the majority. While cities like Pune have seen positive behavioural shifts through visible metering, most areas lag. The real change here needs education and cultural shifts, not just mobile apps.

Then arise questions around data ownership and governance. Who owns water usage data? Who protects it? Without clear privacy frameworks and coordination between sectors like agriculture, energy, and urban planning, the systems can clash or become ineffective.

Urban vs Rural: Different Frontlines, Different Tools

India’s water demand is shaped by both urban and rural populations. This demands both different approaches and technologies. In rural areas, where almost 65% of the population lives, efficiency in irrigation and the sustainability of groundwater are major issues. Technologies such as smart solar-powered pumps and real-time bore well monitoring systems are changing the way water is managed at the village level. The technology ensures that each drop counts.

At the Rural level, a whole system has been set up which relies on monitoring and...Meanwhile, Urban India, around 35% of the population, presents a different kind of problem. Water theft and illicit connections are important problems. If water supply companies lose water that they have not sold, that is as much as 38 per cent in some instances, what experts term "Non-Revenue Water" (NRW). To fight against these, cities are turning to SCADA systems, smart meters, and predictive leak detection technologies. A renewable city effort may also involve water reuse as well as rainwater harvesting in urban areas.

Take Nagpur, for example, the city now recycles 95% of its wastewater. Though the requirements are different; however, our goal is still the same: smarter water for everyone.

The Neighbours

Around the world, countries are already proving how smart water technologies can change the game. In Israel, around 90% of wastewater is recycled, and two million smart meters have been installed to monitor the use and detection of leaks. Singapore has developed a system that treats sewage into drinkable water, turning waste into a reliable resource. In the Netherlands, sensor-embedded dykes and real-time control of urban canals help prevent flooding and optimize water distribution. Japan has rolled out ultrasonic smart meters that provide instant alerts for leaks, making water networks more responsive and efficient.

India doesn't need to copy them. It just needs to adapt smartly.

For example, Boon, formerly known as Swajal, operates solar-powered Water ATMs in over 500 villages, providing clean and affordable drinking water. Companies like Oizom and Phynart offer sensors that track pollution levels and detect household leaks. In parts of Uttar Pradesh, Smart Water Villages use real-time monitoring systems to catch leaks as they happen. India is not starting from scratch. The pieces are in place. What is needed now is speed, scale, and sustained commitment.

The Nation & The Youth: Why It's Our Scene, Not Just a Government Thing

India's water crisis isn't exactly breaking news. But what is new? The fact that our generation has the tools, skills, and digital savviness to do something about it.

Whether you're a coder, a science nerd, a designer, a student activist, or just someone tired of seeing India struggle with crisis, one after the other, this fight needs you.

- Use Your Voice

  You don't have to be a professional influencer to just talk about certain ideas or express your views. You can make a 15-second reel explaining what IoT sensors actually do or what's currently the current situation is around this issue. Build a Twitter thread or a long YouTube video about how your colony mismanages its water. It might seem small, but awareness spreads. Use your platform, whatever it is. You do you.

- Put Your Tech Brain to Work

  If you know how to code even a little, try building a leak detector using Arduino. Into maps? Explore free GIS tools like QGIS and map out your neighbourhood's water sources, drains, or flood-prone zones. A student group in Karnataka built an app to track village water delivery schedules. A team in UP used sensors to help farmers know when to water their crops, saving nearly 40% of irrigation water. Even basic Excel or Python skills can be put to use here.

- Volunteer for the Real Stuff

  Not everything has to be tech. Help restore a dying lake. Join a cleanup drive. Assist your college in building a rooftop rainwater harvesting system. Or go door to door in your neighbourhood to learn about water usage, maybe even pitch smart meters. Campaigns like Jal Shakti Abhiyan and Youth4Water are always looking for hands-on volunteers. Stuff like this is helpful to build your character as a better person, not just for your CV.

- Careers in Smart Water? Yep, That's a Thing

  Water isn't just a crisis, it's an entire career path. If you're into tech, urban policy, climate branding, or agri-analytics, there are internships, fellowships, and job roles waiting for you. Some good places to start? Jal Shakti internships, GIS firms like Esri India, or smart water startups like Boon, CultYvate, and BharatRohan. Even Atal Innovation Mission hackathons often focus on water-based problem-solving. Even your final year project can become something that gets noticed if it solves a real water problem.

- Build Something. Anything.

  Got an idea for a water filter that's more accessible? Or maybe a meter that sends SMS alerts before overflow? Do it. There are contests, grants, and incubators looking for ideas like that. People your age have already built app-connected tanks, Arduino-based overflow sensors, and memes that got municipal attention. You don't have to be a genius. You just have to start.

- Just a reminder: You're Not Powerless

  Whether you're building hardware, spreading information, or organising a local water drive, your voice matters. People who take initiative are the ones who bring revolution. Be one of them.

  So the next time you think "eh, I'm just a student," remember: some of the biggest revolutions started with bored, frustrated young people who decided to do something smart.

One Final Drop

India isn't short of talent. Or passion. Or potential. It's short of Urgency.

The good news? The technology is here. The people are ready. The blueprints exist.

All we need now is follow-through. So, when the next generation walks to a tap and sees clean water flow, let it not be luck. Let it be because we acted. Let it be because you did something.

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