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THULI

Droplets of Innovation. Ripples of Impact



ShaktiDB at PGConf India 2026: Building India's Sovereign Database Future



The Nation
Honours a Vision

A Journal from IITM Pravartak



इलेक्ट्रॉनिक्स एवं
सूचना प्रौद्योगिकी मंत्रालय
MINISTRY OF
ELECTRONICS AND
INFORMATION TECHNOLOGY

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| From the CEO's Desk

Reflecting on a Quarter of Innovation, Recognition and Collaboration

Every milestone begins with an idea. At IITM Pravartak, we have always believed that when ideas are nurtured through research, strengthened by collaboration, and guided by purpose, they create an impact far greater than themselves.

As I reflect on the past quarter, I see not just achievements, but a growing momentum, one that reflects our collective commitment to advancing technology, fostering innovation, and building meaningful partnerships. It is this spirit that continues to shape our journey and strengthen our contribution to India's deep-tech ecosystem.

This edition of Thuli captures some of those moments. More importantly, it reflects the people, collaborations, and shared vision behind them, the true driving force of every milestone we celebrate.

As we also mark five years of IITM Pravartak, we do so with gratitude for everyone who has been part of this journey. While we take pride in what we have built together, we remain even more excited about the opportunities ahead as we continue to innovate, collaborate, and create technologies that serve our nation.

I hope you enjoy this refreshed edition of Thuli and the stories it brings together. As we continue to shape the publication, we look forward to bringing you an even richer reading experience with every edition.

Warm regards,

Dr. M. J. Shankar Raman

Chief Executive Officer

IITM Pravartak Technologies Foundation



The Nation Honours a Vision

Prof. V. Kamakoti, Chairman of IITM Pravartak and Director, IIT Madras, was conferred the Padma Shri, recognising his outstanding contributions to science, technology, education, and nation-building.



Some recognitions transcend individual achievement, they celebrate a vision that has inspired institutions, advanced research, and shaped the future of technology in the nation. This quarter, IITM Pravartak proudly celebrates one such milestone as our Chairman, Prof. V. Kamakoti, was conferred the Padma Shri, one of India's highest civilian honours.

This distinguished recognition celebrates Prof. Kamakoti's exceptional contributions to Science & Engineering - from pioneering SHAKTI, India's first indigenous microprocessor, to advancing cybersecurity research and championing technological self-reliance. His work has strengthened India's innovation ecosystem while inspiring generations of researchers, entrepreneurs, and technologists.

For the IITM Pravartak ecosystem, this recognition is a proud reminder of the values that continue to guide our journey: innovation with purpose, research that addresses real-world challenges, and technology that contributes meaningfully to national progress. As we celebrate this well-deserved honour, we also celebrate the vision that continues to inspire our mission of building technologies for a stronger, more self-reliant India.

| In focus

ShaktiDB at PGConf India 2026: Building India's Sovereign Database Future

IITM Pravartak showcased its vision for ShaktiDB and engaged with the global PostgreSQL community at PGConf India 2026.

As India's digital infrastructure continues to expand, the demand for secure, scalable, and sovereign data systems has never been greater. While PostgreSQL has earned global recognition as one of the world's most trusted open-source relational database management systems, IITM Pravartak is building upon its strengths to address the unique challenges of India's digital landscape.

Built on the robust foundation of PostgreSQL, ShaktiDB is IITM Pravartak's indigenous distributed database platform, engineered to meet the demands of India-scale digital infrastructure. Designed for high availability, horizontal scalability, enhanced security, and regulatory compliance, it reflects the Foundation's commitment to advancing sovereign database technologies for mission-critical applications.

This quarter marked an important milestone in that journey at PGConf India 2026, held in Bengaluru from 26–28 February. As a Platinum Sponsor, IITM Pravartak was among the conference's largest participating delegations, engaging with the global PostgreSQL community through technical talks, hands-on training sessions, and live demonstrations of ShaktiDB.

The platform generated significant interest among government, banking, and enterprise stakeholders, while providing opportunities to exchange ideas, strengthen collaborations, and contribute to the future of open-source database technologies.

As India advances towards greater digital self-reliance, initiatives like Shakti DB reflect IITM Pravartak's commitment to transforming research into impactful technologies that strengthen the nation's digital infrastructure and support the next generation of innovation.



Inside PGConf India 2026

From technical talks and hands-on training to live demonstrations of ShaktiDB, IITM Pravartak played an active role in shaping conversations around PostgreSQL and sovereign database technologies.



Access Methods in PostgreSQL

Ripunjay Tripathi and Harish Perumal explored the inner workings of PostgreSQL access methods, examining how planner cost models influence query execution and database performance. The session also highlighted how evolving application requirements, hardware advancements, and PostgreSQL engine enhancements continue to shape the design of high-performance database systems for modern workloads.

Platinum Talk - Extending PostgreSQL for India-scale Systems

CEO Dr. M. J. Shankar Raman shared IITM Pravartak's vision for extending PostgreSQL through ShaktiDB to meet India's evolving enterprise and sovereign data needs.





Hands-on Training - Learning Beyond the Sessions

Kanthanathan S and Sathakkathullah led interactive training sessions, sharing practical insights with PostgreSQL practitioners from across the ecosystem.

Product Showcase - ShaktiDB in Focus

Live demonstrations highlighted ShaktiDB's architecture, security capabilities, and approach to regulatory compliance for government and enterprise deployments.



The Solution Architecture

ShaktiDB : A Structured Evolution — *Not just a Fork*

ShaktiDB is a curated composition of extensions, deployment blueprints, and security hardening — built on top of and always aligned with PostgreSQL.

- Sovereign & Secure by Design**
Security-first design with encryption, data protection, and tamper-evident auditing
- Distributed Performance at Population Scale**
Distributed architecture with intelligent workload routing for massive data and high concurrency
- Compliance-Ready for Critical Sectors**
Aligned with RBI standards, DPDP Act, and secure infrastructure practices
- Unified Operations & Lifecycle Governance**
Unified console, predictable upgrades, and enterprise-grade governance
- Ecosystem, Talent & Long-Term Support**
Industry-academia-startup collaboration enabling talent, innovation, and 24x7 engineering support

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Community Engagement - Collaborating with the PostgreSQL Ecosystem

With one of the conference's largest delegations, IITM Pravartak engaged with developers, industry leaders, and public sector stakeholders, fostering meaningful technical discussions and future collaborations.

Strengthening India's Defence Through Innovation

Advancing indigenous technologies through a strategic collaboration with the Indian Army's Corps of Electronics and Mechanical Engineers (EME).



As India advances its Aatmanirbhar Bharat vision, partnerships between research institutions, industry, startups, and the Armed Forces are playing a pivotal role in indigenous technology development. This quarter, IITM Pravartak Technologies Foundation signed a Memorandum of Understanding (MoU) with the Indian Army's Directorate General of EME (DG EME), laying the groundwork for collaborative innovation in critical defence technologies.

The Nodal Indigenisation Cell (NIC) of the Base Workshop Group (BWG), Indian Army, has been established at key locations to foster collaboration with academia and industry, accelerating the indigenisation of critical defence technologies. NIC Avadi, Chennai, serves as a strategic hub for the Tamil Nadu Defence Corridor, bringing together research, innovation, prototyping, and deployment under a unified ecosystem to fast-track indigenous capability development.

Following the MoU, the partnership transitioned rapidly from intent to execution. Lt Gen Karanbir Brar (Retd) led a delegation of 14 startups and MSMEs from the IITM Pravartak ecosystem to the Nodal Indigenisation Cell (NIC) and the Heavy Vehicles Factory (HVF), Avadi, to identify opportunities for component indigenisation and collaborative technology development. A first-of-its-kind initiative, the visit brought together the Indian Army, academia, DPSUs, startups, and MSMEs on a common innovation platform, directly linking indigenous innovators with operational defence requirements and accelerating the journey towards Aatmanirbhar Bharat in defence.

By bridging cutting-edge research with operational defence requirements, the partnership positions IITM Pravartak as a catalyst for indigenous innovation, accelerating the development and deployment of technologies that strengthen India's strategic autonomy and defence self-reliance.

Empowering the Next Generation of IoE Startups

IITM Pravartak and iTNT joined hands to strengthen Tamil Nadu's deep-tech ecosystem through a dedicated Internet of Everything (IoE) Co-Incubation Programme.

To foster innovation in the Internet of Everything (IoE) ecosystem, IITM Pravartak Technologies Foundation, in collaboration with iTNT – Tamil Nadu Technology Hub, launched a dedicated IoE Co-Incubation Programme aimed at supporting early-stage deep-tech startups.

The 12–18 month programme offers startups access to technical infrastructure, mentorship, business development opportunities, funding

support, skill development, and a collaborative innovation ecosystem designed to help transform promising ideas into scalable solutions.

The initiative received an overwhelming response from the startup community, prompting an extension of the application window and reinforcing the growing momentum around Tamil Nadu's deep-tech innovation landscape.



Programme Highlights

Partner: iTNT – Tamil Nadu Technology Hub

Focus: Internet of Everything (IoE) Startups

Duration: 12–18 Months

Support: Mentorship, Infrastructure, Funding, Business Development & Networking

Satlabs Space Systems Secures \$1 Million in Seed Funding

The IITM Pravartak-incubated startup is advancing satellite data relay technology to enable near real-time Earth observation insights.

Satlabs Space Systems Pvt. Ltd. has raised \$1 million (₹9 crore) in a seed funding round led by Finvolve and India Accelerator, marking a significant milestone in its growth journey.

Founded by Sooraj Gopakumar and Saisree Eega, Satlabs is developing a satellite data relay solution that addresses delays in downlinking Earth observation data caused by limited ground station coverage. By reducing data latency from hours to minutes, the technology has the potential to support time-critical applications across defence, agriculture, disaster response, offshore energy, and industrial IoT.

The funding will support the company's progress towards launching its proof-of-concept relay satellite, paving the way for a phased satellite constellation that aims to deliver faster, more reliable access to Earth observation data.



Sector: Space Technology

Founded by:

Sooraj Gopakumar & Saisree Eega

Latest Milestone: \$1M Seed Funding

Focus: Satellite Data Relay

Next Step: Proof-of-Concept Satellite Launch

Have a
Story to Share?

We'd love to hear about your research, innovation, partnership, or achievement for a future edition of Thuli.

THULI Challenge

Exclusively for IITM Pravartak employees. Scan, participate, and stand a chance to win!

How well do you know IITM Pravartak and India's innovation ecosystem?

Put your knowledge to the test by answering this edition's trivia challenge. Scan the QR code, complete the quiz, and stand a chance to win exciting prizes.





About IITM Pravartak Technologies Foundation

IITM Pravartak Technologies Foundation is a Technology Innovation Hub (TIH) hosted by IIT Madras, established under the National Mission on Interdisciplinary Cyber-Physical Systems (NM-ICPS) and supported by the Department of Science and Technology, Government of India. As a catalyst for India's deep-tech ecosystem, the Foundation brings together researchers, industry, startups, government, and strategic partners to accelerate indigenous innovation, foster entrepreneurship, and build future-ready technologies in Cyber-Physical Systems.

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