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Your Data Center Doesn't  
Need to Be Bigger —

It Needs to Be Modular



# Why it matters?

India's data center landscape is entering a phase of unprecedented expansion. The market is projected to reach **USD 8 billion by 2028 at 12–13% CAGR<sup>1</sup>**, fueled by cloud adoption, data localisation policies, and exponential AI workload growth.

As demand intensifies, traditional construction models are showing structural limitations: long build cycles, constrained land availability, and rising power requirements.

In this context, modularity has moved from a niche strategy to a foundational operating model. Global modular data center capacity is projected to grow at 17–22% CAGR this decade<sup>2</sup>, while the India modular DC market is expected to exceed USD 3.5 billion by 2030<sup>3</sup>.

For leaders responsible for capacity planning and digital infrastructure resilience, the question is no longer whether modularity works — but how to integrate it into long-term strategy.



**India's data centre future won't be built sequentially.**

**It will be assembled — modular, parallel, and engineered for the AI era, where speed, density, and predictability define competitive advantage**



**Senthil Kumar R**  
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# What's Changing?

## 01 | Time–Quality–Cost Trade-offs Are Being Rewritten

Traditional data center builds in India are hindered by sequential workflows: land clearance, civil work, contractor coordination, and late-stage equipment integration. Modularity restructures the sequence. Factory-built modules for power, cooling, and white space are assembled and tested in parallel with on-site development, compressing the critical path and reducing execution risk.

Beyond speed, modularity improves quality. Controlled factory environments demonstrate lower defect rates and higher repeatability compared with open construction sites<sup>4</sup>. This leads to more predictable PUE performance, tighter uptime bands, and easier adherence to standards such as TIA-942.

## 02 | Structural Constraints Are Making Modularity Inevitable

India's installed IT load is expected to rise from 1–1.5 GW in the mid-2020s to 3–8 GW by 2030<sup>5</sup>. AI-driven workloads could further add 40–50 TWh of annual power demand and require millions of square feet of incremental real estate<sup>6</sup>.

This creates bottlenecks that traditional builds cannot easily absorb. Land availability is tightening in primary markets such as Mumbai and Chennai, and grid augmentation timelines remain uncertain. Modularity does not eliminate these constraints, but it creates parallelism — allowing operators to begin capacity creation earlier by pre-building electrical rooms, cooling skids, modular data halls, and liquid-cooling blocks while waiting for site permissions or grid readiness.

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## 03 | AI and High-Density Loads Are Redefining Architectural Requirements

AI infrastructure is shifting the power and cooling profile of data centers. Densities are rising five- to ten-fold, with roadmaps signaling 180 kW racks and even 1 MW rack designs in the 2030s<sup>7</sup>. National investments in GPU clusters and AI infrastructure<sup>6</sup> are accelerating this trend.

Traditional design approaches struggle with this level of concentration. High-density zones require specialised power delivery, liquid or hybrid cooling, and isolated failure domains. Modular “AI blocks” — pre-engineered pods integrating power, cooling, containment, and monitoring — offer a scalable alternative. This aligns with global trends: modular DC revenues focused on high-density and AI/edge deployments are forecast to reach USD 70–80+ billion by 2030<sup>8</sup>.

**The strategic implication is clear: AI-first designs benefit most from modular-first planning.**

## 04 | India's Modular Ecosystem Is Maturing, but Scale Remains the Gap

India's prefabricated construction market is expanding at 13%+ CAGR<sup>9</sup>, and global OEMs are increasingly localising skid-based and containerised solutions for UPS, thermal management, and power distribution<sup>4</sup>.

India's modular DC market, estimated at USD 1.1–1.2 billion in 2024 and projected to reach USD ~3.5 billion by 2030<sup>3</sup>, already represents approximately 4% of global share and is among the fastest-growing in Asia Pacific<sup>10</sup>.

However, the bottleneck is industrialisation at scale — establishing enough factories, test beds, and system integrators to shift from bespoke modular deployments to standardised, repeatable patterns across the country.





# Implication for Leaders

## ✓ Reinvent Capacity Planning Around Parallel Workflows

Modularity enables regulatory, civil, and grid processes to progress independently of equipment assembly. Leadership teams should redesign execution models to take advantage of this parallelism, reducing exposure to external delays.

## ✓ Treat Modularity as a Core Architectural Choice, Not a Procurement Decision

High-density AI workloads will outpace traditional cooling and electrical architectures. Modular blocks offer a structured way to scale densities without redesigning entire campuses.

## ✓ Standardise Design Libraries Across the Portfolio

Developing approved modular templates for 10 kW racks, 30–50 kW AI pods, edge deployments, and liquid-cooling zones will accelerate deployment and improve predictability.

## ✓ Integrate ESG, Power, and Land Strategy Early

With AI demand projected to add 40–50 TWh<sup>6</sup> of power needs, modular campuses should be planned with renewable integration, waste-heat reuse, and dedicated high-density zones.

## ✓ Invest in New Skills - DfMA, Digital Twins, and Advanced Commissioning

Factory-centric models require competencies that traditional EPC teams may not possess. Upskilling across design, engineering, and operations will be essential.



# Conclusion: From Plug-and-Play to Plug-and-Operate

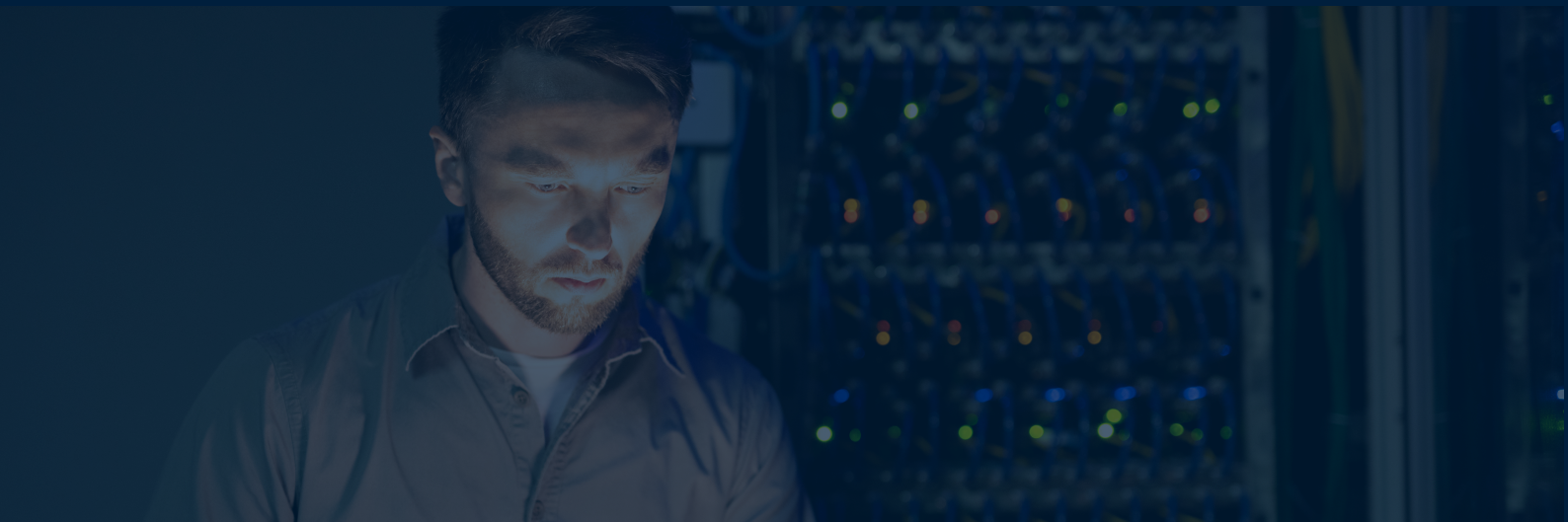
A persistent misconception is that modular data centers compromise efficiency or scalability. Evidence increasingly shows the opposite: modular facilities grow faster<sup>2</sup>, deliver higher repeatability<sup>4</sup>, and align more naturally with AI and edge architectures.

The shift ahead is as behavioural as it is technical. Modularity must be normalised as the default pattern — a system of pre-engineered, pre-tested blocks designed not just for installation speed but for operational predictability from day one.

In a landscape shaped by AI demand, regulatory pressure, and power constraints, modularity is no longer optional. It is becoming the architecture through which India will build and sustain the next decade of digital infrastructure.

#### Sources:

- (1) India DC market: USD 8B by 2028, 12-13% CAGR [Research and Markets, 2024]
- (2) Global modular DC: 17-22% CAGR this decade [Technavio/Grand View Research, 2024]
- (3) India modular DC: USD 3.5B by 2030, 14-20% CAGR [IIMARC/Grand View Research, 2025]
- (4) Modular DCs: Better repeatability, lower defect rates [BIS Research, 2025]
- (5) India DC capacity: 3-8 GW by 2030, USD 30B investment [Times of India/TradJini, 2025]
- (6) AI power demand: 40-50 TWh additional by 2030 [Outlook Business, 2025]
- (7) AI rack densities: 180 kW+, 1 MW racks in 2030s [Nuclear Business Platform, 2025]
- (8) Global modular DC market: USD 80-90B by 2030 [Business Wire/Fortune BI, 2024]
- (9) India prefab construction: 13%+ CAGR [Business Wire, 2024]
- (10) India: 4% global modular DC share, fastest APAC growth [Grand View Research, 2024]





## About Technavious:

Technavious is India's only **Born-in-DC** partner, delivering sustainability-led design, value-driven engineering, and lifecycle support for data centers. With 100+ specialists, 500 MW+ engineered, 50+ global engagements, and 25+ certified facilities, we bring deep multi-disciplinary expertise across strategy, design, engineering, testing, commissioning, and compliance.

Our integrated model reduces project risks, accelerates timelines, and ensures **100% adherence** to global standards including TIA-942, ISO, LEED, EN, and more.

Whether you're building new, expanding capacity, modernising operations, or optimising PUE, Technavious delivers **30% faster deployment**, lower TCO, and future-proof performance across the entire lifecycle.



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