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Powering Vietnam's Semiconductor Ambition

7-8 November 2025 | VinPalace Co Loa, Hanoi, Vietnam

Mr. Sanjay Gupta

Corporate Vice President,
South Korea, Taiwan, China
and ASEAN region
HCLTech

Interview with

HCLTech
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HCLTech provides end-to-end engineering services across the semiconductor value chain, from equipment to fab to test systems. What do you see as the most critical ecosystem readiness challenges for Vietnam's semiconductor industry if it wants to attract this kind of sophisticated service and engineering capability?

Vietnam's ambition to become a global semiconductor hub is genuine and promising. However, to attract sophisticated semiconductor engineering and infrastructure services, the nation must focus on strengthening three critical pillars of readiness:

- Infrastructure Quality: Advanced semiconductor work requires top-tier infrastructure—cleanrooms, stable utilities (power, ultra-pure water, specialty gases), and automation-ready fabs with systems like MES, APC, and AMHS—to support complex design, engineering, and testing.

- Supply Chain Resilience: A strong local supply chain is essential for Vietnam to minimize global risks and maintain continuous equipment and ATE operations.

- Technology Depth: Vietnam must build expertise in advanced packaging, wide-bandgap materials, and high-speed testing to support next-generation semiconductors and compete globally.

To accelerate progress, Vietnam should implement targeted incentives, establish specialized semiconductor industrial parks with shared support services and reliability labs, and leverage modern digital tools. For example, digital twin–based planning—such as the Twin analytics planning suite—can simulate site selection, capacity scaling, overall equipment effectiveness (OEE), and energy consumption. These advanced modeling tools help reduce the time required to achieve operational readiness and minimize investment risks, ensuring a smoother and more predictable pathway to industry growth and competitiveness.

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You have built infrastructure service and engineering teams across the ASEAN region; from that vantage, what key skills gaps do you observe in the region — and how might Vietnam bridge those gaps to support frontier semiconductor engineering and infrastructure services?

To realize its semiconductor ambitions, Vietnam must address critical talent gaps that persist across the ASEAN region. The most significant shortages today include:

- Chip Design and Verification: There is a strong need for expertise in custom ASIC development, safety-critical SoCs, design-for-test (DFT) and design-for-manufacturability (DFM), as well as advanced physical design at leading-edge nodes. Additionally, engineers skilled in creating domain-specific accelerators and GPUs tailored for AI workloads are in high demand.

- Advanced Packaging and Testing: Proficiency in high-bandwidth memory (HBM), 2.5D/3D integration, reliability engineering, automated test equipment (ATE) program development, and yield optimization is essential for supporting next-generation chip manufacturing.

- Green Engineering & OT-IT Convergence: The industry's shift towards sustainability requires talent with skills in energy-efficient fab design, deploying sensors throughout smart factories, leveraging industrial AI, and securing cloud and EDA (Electronic Design Automation) workflows.

Bridging the Talent Gap: A Multi-Pronged Approach

1. Foster Industry–Academia Collaboration: Form strong university-industry partnerships offering paid apprenticeships and joint EDA/ATE curricula so students gain practical, job-ready skills.

2. Nationwide Upskilling Initiatives: Upskill workers in AI, cloud, and sustainable software, and promote SEMI and ISO certifications to boost Vietnam's talent and global credibility.

3. Dual Career Pathways: Create accelerated tracks to reskill existing electronics and mechanical engineers into equipment/facility engineering roles, while transitioning computer science graduates into EDA development and verification engineering. This dual-pathway approach maximizes the utility of Vietnam's current STEM base.

4. Global Rotational Programs: Enable Vietnamese engineers to train abroad in top semiconductor hubs, helping them build expertise and deliver complex projects upon return. At HCLTech, this global exposure has enabled Vietnamese teams to successfully deliver complex projects—such as functional safety SoCs—while building deep local expertise upon their return.

By investing in these targeted strategies, Vietnam can rapidly build a resilient talent pipeline, ensure workforce sustainability and support the country's growth as a competitive global semiconductor player.

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HCLTech has signalled ambitions to double its semiconductor services business in the coming years. What signals would you say Vietnam needs to send to global engineering and services players like yours so they consider Vietnam a strategic location for design, engineering or infrastructure services?

To firmly establish itself as a premier destination for semiconductor design, engineering, and infrastructure services, Vietnam must project a compelling value proposition through a set of targeted strategic signals:

- Policy Stability and Incentives: Show strong support for foreign investment with long-term R&D tax breaks, streamlined approvals, secure IP protections, and sustainability incentives. Stable policies build investor confidence in Vietnam's growth.

- Advanced Digital Infrastructure: Accelerate 5G and IIoT deployment for smart manufacturing. Focus on secure, high-speed cloud connectivity to support EDA workflows and use edge AI for real-time monitoring and predictive maintenance. This digital backbone is vital for operational excellence and competitiveness.

- Commitment to Sustainability: Facilitate access to renewable energy sources and RECs, implement water circularity, and establish carbon reporting frameworks. Embedding sustainability throughout the value chain helps Vietnam attract ESG investors and meet global semiconductor environmental standards customers.

- De-risked Market Entry: Lower barriers for new entrants by creating semiconductor parks with ready-to-use shell facilities, shared automated test equipment (ATE), reliability labs, and co-funding for innovation projects. These measures cut ramp-up risk, enabling companies to scale quickly and efficiently.

By proactively sending these signals to the global market, Vietnam can minimize operational uncertainties and enhance its attractiveness to multinational semiconductor leaders. HCLTech, with nearly five years of active presence in Vietnam and over 25 years of experience serving leading chip and equipment manufacturers worldwide, stands ready to expand operations and drive innovation as these enabling conditions are fully realized.

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Infrastructure services and engineering in the semiconductor sector are increasingly tied to sustainability outcomes (e.g., energy-efficient fab design, embedded sensors, automation). How can Vietnam leverage this trend to differentiate itself and attract investment in green/value-added infrastructure services?

To truly shift from a follower to a co-creator within the global semiconductor landscape, Vietnam must champion collaborative models that accelerate learning, drive innovation, and enable rapid scale-up. The following strategies can unlock significant value and position Vietnam as a leading force:

- Co-Innovation Labs: Establish joint R&D hubs on AI chip design, advanced packaging (HBM, 2.5D, 3D), and smart testing. These labs should foster partnerships with industry leaders, universities, and research institutes to promote knowledge transfer, joint patents, and talent development.

- Shared Infrastructure: Develop multi-tenant cleanroom facilities, automated test equipment (ATE), and reliability testing centers, along with a digital ecosystem using BIM and Twinalytics for lifecycle management. Vietnam can support startups and established players with standardized infrastructure, providing resources, optimizing efficiency, and reducing costs.

- Strategic Ecosystem Partnerships: Launch collaboration programs with key stakeholders like IP/EDA vendors, foundries, and OSATs. These partnerships give local teams access to advanced process nodes, packaging flows, and global supply chains, enabling Vietnamese engineers to work on next-gen products.

- Open, Standards-Based Data Fabric: Build a secure, interoperable data environment linking design, equipment, and manufacturing data. This enables local firms to co-develop IP and solutions. Following global standards ensures compatibility and cross-border collaboration.

HCLTech exemplifies this collaborative approach, successfully transitioning semiconductor designs to production through its advanced labs in Vietnam. By leveraging AI-powered frameworks for silicon design, ATE testing, and intelligent manufacturing, HCLTech demonstrates the transformative potential of these models. With supportive policies, robust partnership architecture, and continued investment in human capital and technology, Vietnam can rapidly scale these initiatives, integrate more deeply into global value chains, and emerge as a preferred destination for high-value semiconductor innovation.

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As Vietnam prepares to host more advanced technology and semiconductor investment, what types of collaborative models (co-innovation labs, engineering hubs, shared infrastructure) should the country explore to integrate deeply into global value chains and ensure that local firms can co-create and not just follow?

HCLTech's spec-to-platform approach focuses on delivering seamless, end-to-end silicon development. This approach ensures faster design realization and achieves first-time-right results in silicon production. It involves several stages, including design verification, physical design, FPGA prototype, emulation, pre-silicon validation, advanced packaging, production testing, and post-silicon validation and qualification. This method is designed to streamline the process from the initial product concept through to high-volume production, ensuring efficiency and quality in silicon development.

The spec-to-platform approach at HCLTech for enterprise technology solutions and transformation initiatives involves several key components:

1. Digital Platform Engineering: HCLTech provides end-to-end services that support the entire digital transformation journey. This includes strategizing, building, migrating, deploying, and sustaining operations. The focus is on creating platforms that drive business growth by opening new revenue streams and monetizing existing assets.

2. Solution Accelerators and Frameworks: HCLTech offers a portfolio of industry-ready solution accelerators designed to help brands create and manage impactful digital platforms. These accelerators provide a time-to-market advantage and are tailored to deliver exponential business impact.

3. Platform Acceleration Suite (PAS): This suite combines reusable software components, packaged application frameworks, and automation tools to speed up platform development. It is aimed at maximizing the digital economy by enhancing platform performance and scalability.

4. Cloud Bridge Suite: This suite of solutions accelerates and automates the modernization, development, and deployment of cloud-native platforms, ensuring seamless integration and operation.

5. AI/ML-based Frameworks: Tools like HCLTech Magnus, a no-code test automation framework, enable quicker test design and optimized execution across various platforms, enhancing the efficiency of digital transformation efforts.

6. Connected Ecosystem Frameworks: HCLTech PICASSO TM and CARE TM frameworks are designed to build and implement digital service platforms, leveraging connected ecosystems to accelerate development and deployment.

In Vietnam, HCLTech has established a substantial presence, capitalizing on the country's rich talent pool and strategic geographic location. Vietnam serves as a prime delivery center for digital, engineering, AI, and cloud services, catering to a global clientele.

As a Global Development Center, HCLTech in Vietnam supports customer delivery across various countries, including Japan, Korea, Taiwan, and others in the Asia-Pacific region. This strategic positioning enhances HCLTech's ability to deliver innovative solutions and drive digital transformation for its clients worldwide.

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