

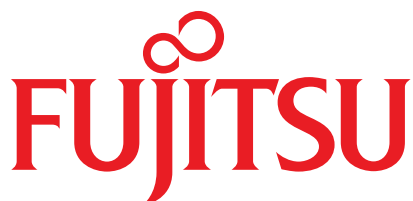
FROST & SULLIVAN  
**BEST PRACTICES**



2026

ASIA-PACIFIC  
QUANTUM-INSPIRED  
COMPUTING

**ENABLING TECHNOLOGY  
LEADERSHIP**



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## Best Practices Criteria for World-class Performance

Frost & Sullivan applies a rigorous analytical process to evaluate multiple nominees for each recognition category before determining the final recognition recipient. The process involves a detailed evaluation of best practices criteria across two dimensions for each nominated company. Fujitsu excels in many of the criteria in the quantum-inspired computing space.

RECOGNITION CRITERIA	
<i>Technology Leverage</i>	<i>Customer Impact</i>
Commitment to Innovation	Price/Performance Value
Commitment to Creativity	Customer Purchase Experience
Stage Gate Efficiency	Customer Ownership Experience
Commercialization Success	Customer Service Experience
Application Diversity	Brand Equity

## Market Dynamics Shaping Advanced and Quantum-Inspired Computing

Global demand for more capable computing continues to rise as organizations manage larger datasets, more interconnected operations, and complex optimization problems. These conditions drive the need for models that process high-dimensional workloads, evaluate many interdependencies, and deliver consistent results within constrained operational environments. Industries such as healthcare, financial services, manufacturing, logistics, and energy pursue advanced optimization methods to address challenges that exceed the limits of conventional computing.

Advancements in quantum technology further influence this market direction. Research groups and technology providers continue to improve quantum processor scalability, refine error management techniques, and explore hybrid architectures that combine quantum and classical systems. These developments shift the field from theoretical exploration toward early application development in areas such as molecular modeling, risk analysis, route optimization, and inventory management. Government and private institutions expand research investment to strengthen national capabilities and participate in the long-term evolution of quantum computing.

These opportunities are balanced by structural challenges that limit broad enterprise adoption of quantum hardware. Quantum systems require highly specialized environments and significant capital expenditure, and they depend on skilled professionals capable of developing and maintaining complex architectures. Qubit instability restricts system reliability, and few commercial environments support the infrastructure

and talent requirements associated with real quantum machines. Research institutions remain the primary users of quantum hardware, while enterprises focus on advanced computing approaches that function within existing operational constraints. These conditions increase demand for quantum-inspired computing as a practical method that applies advanced optimization without specialized quantum hardware.

*“Frost & Sullivan finds that Fujitsu’s strategic positioning reflects technology maturity, cost considerations, and adoption patterns in the APAC region. The company places quantum-inspired computing within realistic enterprise conditions and guides organizations to assess advanced optimization in a controlled setting toward broader quantum adoption.”*

**- Ain Sarah Aishah**  
**Best Practices Research Analyst**

Hybrid computing models gain traction as organizations manage immediate operational needs with long-term innovation goals. These models route parts of a workload to the compute resources best suited to each task, allowing enterprises to explore advanced optimization techniques without relying on fully mature quantum systems. This direction reflects a broader industry shift toward architecture that improves efficiency, flexibility, and performance consistency.

The Asia-Pacific (APAC) region responds to these trends through increased research activity, national initiatives, and early exploration of advanced optimization

capabilities across sectors such as energy, manufacturing, logistics, and digital services. Governments and universities expand research programs, invest in workforce development, and encourage public-private collaboration to build long-term technological capacity. While adoption patterns vary, organizations in the region show growing interest in methods that handle complex optimization problems and support data-intensive operations.

As markets pursue stronger optimization performance and more scalable compute models, enterprises evaluate methods that operate within existing infrastructure and support long-term technology evolution. This environment creates conditions for approaches that meet operational requirements today while opening pathways to future high-performance computing systems.

### **Bridging Technology Readiness and Enterprise Needs**

Fujitsu, established in 1935 and headquartered in Kawasaki, Japan, positions quantum-inspired computing as a practical option for enterprises that aim to improve optimization performance without depending on quantum computing technologies that are not commercially ready. The company guides organizations to study workload behavior and match compute resources to dataset structure, problem scale, and expected return on investment. This approach encourages enterprises to adopt hybrid computing and select suitable compute models instead of following external trends.

Fujitsu strengthens this position by grounding it in a clear understanding of regional quantum adoption. Singapore and Australia lead early research programs in real quantum computing, while most enterprises in Southeast Asia remain cautious due to high cost and limited technology maturity. Government agencies and research institutions continue to drive most quantum experimentation, and commercial adoption stays minimal. The company responds to this environment by offering quantum-inspired computing, as part of its Quantum solutions, for organizations to evaluate advanced optimization without requiring

specialized hardware. This approach lowers adoption barriers and allows customers to test new methods within existing infrastructure.

Fujitsu supports enterprise decision-making by showing how quantum and quantum-inspired computing fits within broader architecture planning. The company encourages customers to examine factors such as dimensionality, data variability, and time sensitivity when choosing compute resources. This structured evaluation process directs organizations toward problems where advanced optimization creates measurable benefits and aligns with hybrid computing strategies that evolve with business needs.

Frost & Sullivan finds that Fujitsu's strategic positioning reflects technology maturity, cost considerations, and adoption patterns in the APAC region. The company places quantum-inspired computing within realistic enterprise conditions and guides organizations to assess advanced optimization in a controlled setting toward broader quantum adoption. This clarity enables enterprises to reduce adoption risk, make informed decisions, and integrate new compute approaches as part of sustained transformation efforts.

### Aligning Quantum Innovation with Scalable Enterprise Systems

Fujitsu advances quantum-inspired and quantum computing by prioritizing architectural stability, performance scalability, and coordinated development across hardware and software. The company built four generations of the Quantum-Inspired Technology – Digital Annealer (Digital Annealer) and maintained a consistent usage model throughout this progression. The first-generation system operated as a chip-based platform that handled 1,024 bits and further generations were offered as cloud-based services. It then shifted to a software-based architecture that runs on high-performance servers equipped with central processing units (CPU) and graphics processing units (GPU). This transition increased processing speed and scalability while preserving the Quadratic Unconstrained Binary Optimization (QUBO) formulation, ensuring continuity in customer workflows.

Fujitsu strengthens the Digital Annealer through technical features that enhance optimization quality and model expressiveness. The system processes each optimization problem as a unified structure through multicore execution, allowing global solution search without fragmenting the problem. One-way and two-way one-hot encoding techniques represent rejection scenarios efficiently, forming the base of search accelerator techniques. Autonomous constraint scaling reduces the risk of misconfigured penalty parameters and removes manual tuning requirements. The Digital Annealer accepts linear inequality constraints directly, removing the need for slack variables and preserving variable space for primary problem elements.

Fujitsu enables practical deployment by lowering development and infrastructure barriers. Developers can generate QUBO formulations through open-source quadratic libraries and run them directly on the Digital Annealer to simplify integration. Full connectivity across variables increases model expressiveness and supports complex optimization structures. The system operates in standard data center racks and unlike quantum computing solutions, does not require cryogenic environments, allowing enterprises to adopt advanced optimization within existing facilities. This design supports large-scale optimization models, with up to approximately 100,000 variables depending on problem structure and formulation, enabling organizations to address complex operational problems without modifying existing infrastructure.

Fujitsu extends these quantum-inspired capabilities through a hybrid computing framework that combines high-performance computing resources, GPU-based acceleration, and quantum processors. Although not part of the Quantum technologies, the company launched the artificial intelligence (AI) Computing Broker, a middleware that maximizes GPU utilization by dynamically sharing GPUs across concurrent AI workloads and backfilling idle GPU time. Fujitsu is developing a roadmap for a hybrid computing platform comprising CPUs, GPUs, and QPUs, with planned orchestration capabilities intended to direct workloads to appropriate compute resources and improve overall computational efficiency. This structure positions hybrid computing as a long-term architecture that can coordinate diverse compute resources as requirements evolve.

Frost & Sullivan recognizes that Fujitsu aligns quantum-inspired innovation with enterprise scalability by combining architectural continuity, practical deployment readiness, and a forward-looking hybrid computing strategy. The company strengthens current adoption through the Digital Annealer's stable usage model, infrastructure compatibility, and integration pathways, while positioning customers to expand into broader advanced computing environments over time.

### Connecting Quantum-Inspired Computing to Real-World Impact

Fujitsu demonstrates the value of quantum-inspired computing through projects that address complex operational challenges in various industries. Automotive manufacturers, such as Toyota, collaborate with the company to improve production scheduling and resource allocation in factories with many interdependent constraints. Pharmaceuticals use Fujitsu's technology to accelerate molecular similarity search to identify potential compounds more efficiently. Financial institutions apply advanced optimization to construct portfolios that balance return expectations with risk constraints across market conditions. Retailers and distributors leverage Fujitsu's capabilities to coordinate delivery routes, manage inventory decisions, and analyze large variable sets in time-sensitive environments. These engagements show that quantum-inspired computing enhances decision-making in high-dimensional optimization and operational precision.

In the APAC region, Fujitsu aligns projects with local priorities. In Thailand, the company partners with a quantum research institution and an energy provider to run a proof-of-concept that optimizes different renewable energy loads for streamlined consumption as part of national sustainability goals. The initiative balances renewable and conventional energy sources and completes an initial phase that meets defined objectives, followed by a planned second phase to expand the scope. In Australia, Fujitsu is part of a government-supported project led by La Trobe University, with The University of Western Australia, NextDC and AQ Intelligence, to pilot quantum- and AI-enabled optimization for improving data center cooling efficiency, reducing energy use and lowering emissions. These projects highlight Fujitsu's ability to adapt advanced optimization methods to regional energy transition strategies and specific policy and operational contexts.

Fujitsu applies advanced computing to scientific and engineering problems that require large-scale combinatorial exploration. The company supported the UK Space Agency by optimizing space debris removal and evaluating millions of debris objects to identify viable removal paths within orbital dynamics. This work indicates that quantum-inspired optimization can address search spaces exceeding the limits of conventional planning tools. Fujitsu also worked with the Hamburg Port Authority to apply quantum-

inspired optimization services powered by the Digital Annealer to improve logistics flow across port operations. This approach reduced traffic congestion and cut carbon dioxide emissions by up to 9%,<sup>1</sup> demonstrating how Digital Annealer-based optimization delivers measurable operational and sustainability outcomes in complex transport environments.

In a quantum computing research context, using Quantum Simulator, Fujitsu collaborates with Shibaura Institute of Technology and Waseda University on robotic posture movement optimization through a hybrid workflow that combines quantum calculations with classical inverse kinematics. The team represents robot links with qubits, and verification using Fujitsu's quantum simulator achieved up to a 43% error reduction with fewer calculations compared with conventional methods.<sup>2</sup> The role of quantum entanglement was also validated through experiments on a 64-qubit quantum computer. This method enhances motion planning for a 17-joint full-body model, exemplifying how quantum and classical techniques operate together to improve model performance.

Fujitsu encourages adoption through structured engagement that guides customers from exploration to deployment. The company conducts workshops to understand customer operations and identify potential use cases. It then offers trial access to test the technology with representative workloads. Positive results lead to proof-of-concept projects that measure performance against specific criteria and enable commercial deployment. This approach allows customers to evaluate new optimization methods with minimal risk, ensuring each step builds on proven outcomes.

Frost & Sullivan observes that Fujitsu links technical capability to operational relevance by showing advanced optimization performance in production and research environments. The company supports adoption through a phased model that provides customers with the opportunity to test methods, measure outcomes, and expand deployment based on evidence. This approach gives enterprises clarity as they incorporate new optimization techniques, measure results in practice, and plan broader operational use. It also aligns with Fujitsu's broader quantum-inspired roadmap, including a planned fifth generation in fiscal 2026 with support for higher order optimization formulations, conversational optimization services using large language models trained with optimization libraries and enabled with solver execution backends, and application-focused offerings such as vehicle route planning software built on Fujitsu's existing Digital Annealer stack.

### **Advancing Quantum Computing Through Hardware and Research**

Beyond current deployments and customer engagement models, Fujitsu is also advancing a longer-term quantum computing strategy through hardware development, simulation capabilities, and research partnerships. Its hardware roadmap demonstrates steady progress toward larger and more capable quantum systems. In collaboration with RIKEN, the company developed a 64-qubit superconducting quantum computer in 2023 and expanded it to a 256-qubit system in 2025 using a scalable three-dimensional interconnect design. Fujitsu enhanced the thermal structure to balance control circuit heat with cooling capacity and increased qubit density within the same dilution refrigerator footprint. Fujitsu's

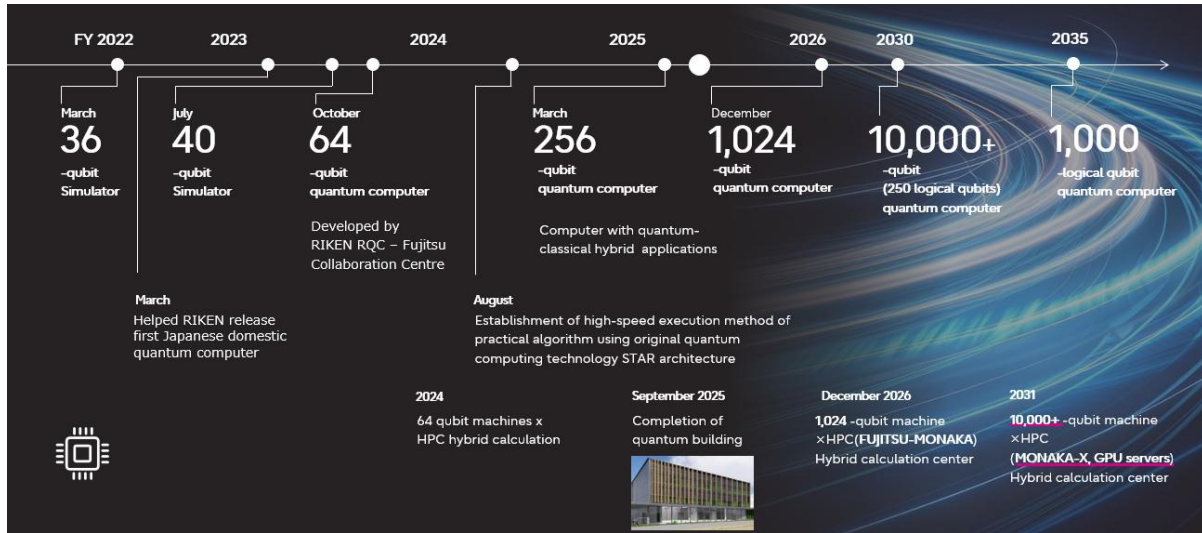
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<sup>1</sup> <https://www.fujitsu.com/emeia/about/resources/news/press-releases/2021/emeia-08122021-fujitsu-quantum-inspired-optimization-services-cut-traffic-jams-and-co2-emissions-at-hamburg-port.html>

<sup>2</sup> <https://global.fujitsu/en-global/pr/news/2025/08/25-01-en>

roadmap includes targets to install a 1,000-qubit-class system around 2026 and progress toward a long-term goal of more than 10,000 physical qubits. The company has articulated research targets of achieving approximately 250 logical qubits by 2030 and 1,000 logical qubits by 2035, subject to continued technological advancement.

This broader development path is reflected in Fujitsu’s public roadmap. Fujitsu’s public quantum computing roadmap outlines system milestones from fiscal 2022 to 2035, including qubit-scaling targets and the evolution of hybrid computing infrastructure.



Source: Fujitsu

Fujitsu also complements this roadmap with quantum simulation capabilities, including a 40-qubit quantum computer simulator that forms part of its hybrid quantum computing platform with RIKEN and supports quantum application research and development. The company positions this simulator as a practical environment for testing quantum algorithms under ideal conditions, comparing them with noisy

*“Frost & Sullivan recognizes that Fujitsu’s ecosystem approach focuses on durable processes, clear partnership structures, and diversified research engagement, including collaborations with La Trobe University and ANU. These elements support continuous progress across advanced computing by giving contributors a stable organizational framework.”*

**- Kenny Yeo**  
Director, ICT

quantum hardware, and refining applications before deployment. Fujitsu also highlights performance advances in this area, including technology to accelerate quantum circuit computation, and supports broader research access through structured quantum simulator programs and proof-of-concept work with customers.

The company complements its superconducting work through a collaboration with QuTech at TU Delft on diamond spin qubits (NV centers), where researchers demonstrated a universal gate set with error rates below 0.1% and fidelity above 99.9%.<sup>3</sup> Diamond spin research contributes to scalable quantum architectures as these

<sup>3</sup> <https://www.fujitsu.com/global/about/resources/news/press-releases/2025/0324-02.html>

qubits operate at higher temperatures than those necessary for superconducting computers, reducing dependence on ultracold temperature setups, and support optical interconnects for distributed systems.

Frost & Sullivan notes that Fujitsu's technology roadmap demonstrates a coordinated approach to strengthening quantum-inspired and quantum computing capabilities. Beyond enhancing the Digital Annealer's performance and scalability, the company advances quantum computing through hardware development, simulation capabilities, and research partnerships spanning multiple qubit modalities. This breadth across advanced computing domains, including quantum and high-performance computing, strengthens Fujitsu's ability to support enterprise and research use cases as requirements evolve. Fujitsu is positioned to address increasingly complex optimization and computational workloads through a combination of near-term practicality and long-term technology development.

### **Structuring Advanced Computing through an Ecosystem Model**

Fujitsu structures its advanced computing activities around an ecosystem model that enables coordinated development across research and industry environments. The company manages this ecosystem through shared processes that guide planning, evaluation, and refinement in quantum-inspired computing, quantum computing, and related software tools. These processes draw on Fujitsu's experience in high-performance computing and digital services, forming a stable framework for long-term research. This structure allows the company to absorb new findings and collaboration inputs without fragmenting development or creating isolated research tracks.

Fujitsu strengthens this ecosystem by establishing research partnerships that contribute to various areas of advanced computing. The company collaborates with academic institutions, national research laboratories, and international research centers on theoretical research, algorithm development, system behavior analysis, and new computational approaches. In the APAC region, these collaborations include La Trobe University and the Australian National University (ANU). Fujitsu works with La Trobe University on quantum- and AI-enabled optimization research for data center cooling, while its memorandum of understanding with ANU supports the establishment of a quantum research center and expands researcher access to Fujitsu's quantum systems and simulators. This diversification allows research pathways to inform one another and ensures that progress in one area contributes to the broader development effort. This strategy helps Fujitsu maintain continuity in long-term research programs that extend beyond individual technology cycles.

Fujitsu complements these collaborations with structured partnership models that demonstrate its engagement with stakeholders. The company organizes collaboration through three models: research partnerships that support early exploration, co-creation partnerships that combine technical expertise with domain knowledge to develop solutions and shared intellectual property, and commercial partnerships that integrate advanced computing capabilities into partner offerings and enable joint activities in broader markets. These models define roles and expected outcomes across engagements and allow Fujitsu to coordinate with customers without losing direction.

Fujitsu's ecosystem also benefits from its standing as a Japanese technology provider. Organizations in the APAC region view Japan as a neutral source of technology in an environment where procurement decisions can reflect geopolitical considerations. This neutrality helps the company collaborate with government

agencies, research institutions, and commercial partners in markets that follow different technology policies. The company's identity emphasizes reliability and structured development, providing partners with transparency in managing research programs and evaluating new contributions.

Frost & Sullivan recognizes that Fujitsu's ecosystem approach focuses on durable processes, clear partnership structures, and diversified research engagement. These elements support continuous progress across advanced computing by giving contributors a stable organizational framework. This consistency maintains continuity in multiple research cycles and incorporates new developments without disrupting long-term objectives.

## Conclusion

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Fujitsu demonstrates a structured and strategic approach to advanced computing by aligning technology development, adoption strategy, and real-world deployment practices. The company advances quantum-inspired and quantum computing through a coordinated roadmap that strengthens architectural stability, scalability, and integration across hardware and software. It complements these developments with projects that deliver measurable performance in complex operational environments and engagement models that guide organizations from exploration to deployment in defined stages. This approach enables enterprises to evaluate advanced optimization technologies within clear decision frameworks and adopt them with reduced operational risk.

Fujitsu reinforces this progress through an ecosystem that supports sustained research collaboration, organized partnership structures, and long-term development continuity. The company integrates contributions from academic institutions, national laboratories, and industry partners into a shared framework that prevents fragmentation and maintains momentum across technology cycles. This combination of technical development, demonstrated operational impact, structured customer engagement, and coordinated ecosystem management positions Fujitsu as a central contributor to the evolution of advanced computing in the Asia-Pacific (APAC) region.

With its strong overall performance, Fujitsu earns Frost & Sullivan's 2026 APAC Enabling Technology Leadership Recognition in the quantum-inspired computing industry.

## What You Need to Know about the Enabling Technology Leadership Recognition

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Frost & Sullivan's Enabling Technology Leadership Recognition is its top honor and recognizes the market participant that exemplifies visionary innovation, market-leading performance, and unmatched customer care.

### Best Practices Recognition Analysis

For the Enabling Technology Leadership Recognition, Frost & Sullivan analysts independently evaluated the criteria listed below.

#### Technology Leverage

**Commitment to Innovation:** Continuous emerging technology adoption and creation enables new product development and enhances product performance

**Commitment to Creativity:** Company leverages technology advancements to push the limits of form and function in the pursuit of white space innovation

**Stage Gate Efficiency:** Technology adoption enhances the stage gate process for launching new products and solutions

**Commercialization:** Company displays a proven track record of taking new technologies to market with a high success rate

**Application Diversity:** Company develops and/or integrates technology that serves multiple applications and multiple environments

#### Customer Impact

**Price/Performance Value:** Products or services offer the best ROI and superior value compared to similar market offerings

**Customer Purchase Experience:** Purchase experience with minimal friction and high transparency assures customers that they are buying the optimal solution to address both their needs and constraints

**Customer Ownership Excellence:** Products and solutions evolve continuously in sync with the customers' own growth journeys, engendering pride of ownership and enhanced customer experience

**Customer Service Experience:** Customer service is readily accessible and stress-free, and delivered with high quality, high availability, and fast response time

**Brand Equity:** Customers perceive the brand positively and exhibit high brand loyalty, which is regularly measured and confirmed through a high Net Promoter Score®

## Best Practices Recognition Analytics Methodology

### Inspire the World to Support True Leaders

This long-term process spans 12 months, beginning with the prioritization of the sector. It involves a rigorous approach that includes comprehensive scanning and analytics to identify key best practice trends. A dedicated team of analysts, advisors, coaches, and experts collaborates closely, ensuring thorough review and input. The goal is to maximize the company’s long-term value by leveraging unique perspectives to support each Best Practice Recognition and identify meaningful transformation and impact.

STEP		VALUE IMPACT	
		WHAT	WHY
1	<b>Opportunity Universe</b>	Identify Sectors with the Greatest Impact on the Global Economy	Value to Economic Development
2	<b>Transformational Model</b>	Analyze Strategic Imperatives That Drive Transformation	Understand and Create a Winning Strategy
3	<b>Ecosystem</b>	Map Critical Value Chains	Comprehensive Community that Shapes the Sector
4	<b>Growth Generator</b>	Data Foundation That Provides Decision Support System	Spark Opportunities and Accelerate Decision-making
5	<b>Growth Opportunities</b>	Identify Opportunities Generated by Companies	Drive the Transformation of the Industry
6	<b>Frost Radar</b>	Benchmark Companies on Future Growth Potential	Identify Most Powerful Companies to Action
7	<b>Best Practices</b>	Identify Companies Achieving Best Practices in All Critical Perspectives	Inspire the World
8	<b>Companies to Action</b>	Tell Your Story to the World (BICEP*)	Ecosystem Community Supporting Future Success

\*Board of Directors, Investors, Customers, Employees, Partners

## About Frost & Sullivan

Frost & Sullivan is the Growth Pipeline Company™. We power our clients to a future shaped by growth. Our Growth Pipeline as a Service™ provides the CEO and the CEO's growth team with a continuous and rigorous platform of growth opportunities, ensuring long-term success. To achieve positive outcomes, our team leverages over 60 years of experience, coaching organizations of all types and sizes across 6 continents with our proven best practices. To power your Growth Pipeline future, visit Frost & Sullivan at <http://www.frost.com>.

## The Growth Pipeline Generator™

Frost & Sullivan's proprietary model to systematically create ongoing growth opportunities and strategies for our clients is fuelled by the Innovation Generator™.

[Learn more.](#)

### Key Impacts:

- **Growth Pipeline:** Continuous Flow of Growth Opportunities
- **Growth Strategies:** Proven Best Practices
- **Innovation Culture:** Optimized Customer Experience
- **ROI & Margin:** Implementation Excellence
- **Transformational Growth:** Industry Leadership



## The Innovation Generator™

Our 6 analytical perspectives are crucial in capturing the broadest range of innovative growth opportunities, most of which occur at the points of these perspectives.

### Analytical Perspectives:

- **Megatrend (MT)**
- **Business Model (BM)**
- **Technology (TE)**
- **Industries (IN)**
- **Customer (CU)**
- **Geographies (GE)**

