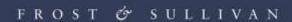


2020 GLOBAL DATA CENTRE INFRASTRUCTURE AND OPERATIONS VISIONARY INNOVATION LEADERSHIP AWARD



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Background and Company Performance

Industry Challenges

Society lives in a day and age where there is an overwhelming dependence on the internet. IP traffic growth rates have been sky rocketing over the past few years, and this is trend is expected to gain significant momentum with the advent of 5G. Frost & Sullivan's own research confirms that internet penetration is expected to increase from 51% of global population in 2018 to 66% in 2023, while the total number of devices connected to the internet will be more than 3 times the global population by 2023. 5G will further drive bandwidth in applications such as IoT, IIoT, Industry 4.0, Augmented Reality, Artificial Intelligence, Smart Cities and so on.

Furthermore, 5G is also expected to significantly boost capabilities in latency sensitive applications such as autonomous cars, which on average are expected to generate 4 TB of data per hour (per car). On the other hand, the economic impact of internet downtime in today's world is quite staggering. It is estimated that a one hour down time could cost business anywhere between \$100,000 and \$5 million. This begs the question as to how resilient is the internet core infrastructure. It simply is not as resilient as it should be. This is due to the way the current internet connectivity infrastructure is modeled; it is highly concentrated. For instance, a vast majority of the IP traffic is routed across just 10 carrier hotels in the US. This presents a serious risk of single points of failure that threatens availability and preservation of low latency connections. Frost & Sullivan analysts monitor how this has also created an unhealthy competitive landscape where the carrier hotels have the leverage to dictate and control costs.

Focus on the Future and Best Practices Implementation

Visionary Scenarios through Mega Trends

QTS has a razor sharp focus in identifying and analyzing mega trends and performing scenario analysis. During the course of Frost & Sullivan's independent research, it was highly impressive to see the level of focus and dedication QTS places in tracking, analyzing, and eventually leveraging mega trends with an end goal to enhance customer value multifold. By evaluating its core strengths and by investing in functionalities highly valued by the end users, QTS has developed a distinguished set of core competencies - allowing it offer best of breed data centre facilities that offer industry leading reliability, resilience, and unparalleled operational visibility. The company is able to achieve this by leveraging a combination of cutting edge technologies and industry leading engineering best practices; eventually offering its customers the best of both worlds – operational excellence and future proofing. The way that QTS has incorporated long-range, macrolevel scenarios into its innovation strategy, thereby enabling first-to-market growth opportunity solutions, is quite commendable. Frost & Sullivan believes that the company's effort to mitigate risk via internet diversification is a perfect testament to this.

Over the years, IP carriers and enterprises kept expanding their presence in a highly concentrated manner. By doing so, they have unwittingly exposed internet traffic to single points of failure. As highlighted in the above section, there are 10 buildings in the US

through which the majority of the IP traffic passes through. An incident in one of these carrier hotels could either result in a large scale down time or increased latency as a result of re-routing traffic to another suitable facility. Unfortunately, not many players in the ecosystem realize the gravity of the situation and the dire need to diversify the current internet infrastructure by installing core routers in additional data centres that fall under the same metro area as an existing connectivity hub. QTS's effort to diversify this internet concentration is truly commendable. The company took it upon itself to not only educate the industry, but also to implement strategies that would bring about a positive disruption and create a step change in the internet connectivity world.

It is only fitting to say that QTS is a torch bearer when it comes to addressing this connectivity predicament. With its pioneering vision, the company has created multiple network access points (NAPs); which are essentially data centres acting as ubiquitous global interconnection hubs that allow services utilizing subsea cables to peer and interconnect in an ideal manner. As a first step on a revolutionary journey, QTS established its first NAP in Richmond nearly two years ago. The company chose Richmond to capitalize on the two sub-sea cable landings in Virginia Beach that opened up access to global markets at extremely low latencies and high capacity levels. In addition to the Richmond NAP, the company has set up three additional NAPs, including one in Eemshaven, Netherlands. While the Eemshaven NAP offers lowest latency access to Google cloud, it also serves northern Europe, the Eastern blocks and the Nordics. The other two NAPs are strategically located in Piscataway, New Jersey and Hillsboro, Oregon. It is noteworthy that both facilities offer 100% renewable energy sourced power. All of QTS's NAPs are structured uniquely to offer a range of connectivity options such as SDN networks, internet exchanges, cloud providers, subsea cables, and so on.

Frost & Sullivan firmly believes that QTS NAPs are set to bring to the industry an unprecedented level of flexibility, sophistication, enhanced economics, risk mitigation and a healthy competitive environment; ultimately promoting availability and maintaining low-latency.

Blue Ocean Strategy

QTS's deep understanding of end user needs and specific requirements is the foundation of its product development process. The company's excellence in the data centre infrastructure can primarily be attributed to its ability to develop products that perfectly align not only with customers' current expectations, but also anticipated future requirements. This is due to the simple fact that its product designs are directly inspired and influenced by evolving customer needs. QTS is always ahead of the competition when it comes to identifying/analyzing market trends and developing products and solutions that effectively address customer frustrations and unmet needs; ultimately enhancing customer value. QTS's strong strategic focus on creating a leadership position in a potentially uncontested market space is underpinned by its meticulous efforts to digitize customer experience. In order to move closer to its vision of creating the ultimate data centre user experience that would eventually change the landscape of data centre infrastructure and operations, the company started to build a software-defined company

within QTS nearly four years ago; this was driven by the sole purpose of delivering operational savings and creating newer business innovations.

The SDP - a fully digitized service delivery platform - was born out of this initiative. QTS's SDP essentially empowers its customers to manage and optimize their real time data centre environments in a way no solution has ever done before; this is a true industry first. It encompasses suite of 3D visualization tools and digital apps, through which it not only offers end users access to unparalleled visibility and control over critical infrastructure data, but also provides a multitude of value additions such as ability to order and provision services at a touch of a button, on-demand oversight, and control of deployments from a single platform. Before diving into the details of SDP and the phenomenal value addition it brings to the end user, it is imperative to state the fact that SDP is not another DCIM tool-set. It cannot even be compared with the most advanced DCIM solutions available in the market, as SDP brings so much more to the table than such DCIM offerings.

One of the key differentiators of SDP is its ability to provide its customers data access in a way that's digestible for them; this is enabled by its API driven approach. This approach essentially offers customers an incredible level of interfacing flexibility, eventually allowing users to interface with the platform in any manner they prefer (as opposed to being restricted to a particular portal or app). The company has gone a step further and open sourced its API, giving access to the broader data center industry to replicate. This demonstrates how far ahead QTS is placed in the technology curve and more importantly, its tenacity to drive transparency and its willingness to contribute to the overall enhancement of the data centre industry.

On the other hand, the SDP leverages cutting edge technologies such as artificial intelligence, machine learning and predictive analytics to make its data centres smarter. One of the exciting functionalities in this respect is its ability to accurately forecast power consumption for seven days; it does so within a tolerance of less than 1% of variation. This results in substantial costs savings to QTS and its customers. Moreover, it is also able to use the same neural network to forecast power consumption for 30 days and 60 days within 5% variation. Other aspects include ability to automate provisioning of services, perform online ordering and asset management, and so on. Furthermore, by deploying VR technologies, it has created innovative virtual collaboration tools and a 3D visualization application that provides an exact replication of a customer's IT environment in real-time. In essence, there are three layers to SDP. At the first layer, it gives its customers visibility to data far beyond their imagination (it digitizes, aggregates and analyzes more than 4 billion data points per day). The second layer offers the ability to dynamically manage the data; and finally at the third layer, it offers the ability to bring partners on to its platform. It offers seamless integration of its customer's infrastructure with leading IT partners, CSPs, and carriers.

Outstanding Growth Performance Driven by Unique Customer Experience

Frost & Sullivan feels that it is intriguing to see the company evolve from being an American pioneer to becoming a global leader in visionary innovation and technology

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leverage. The driving force behind its success is its colossal perseverance and commitment to pursuing its vision of creating superior data centres that not only address customers' current needs, but also evolving future needs. Frost & Sullivan's research findings suggest that QTS offers top notch customer experience. When it comes to delivering excellent customer experience, there are two key aspects that drive success; technical performance of the data centre, and customer service. QTS clearly excels at both. The company's rapport with the customer has been one of its key success factors in building and maintaining a positive experience, resulting in a lasting bond. This is apparent from its continually increasing list of orders and positive customer testimonials. From a technical performance perspective, as highlighted in the above sections, QTS employs a multitude of best practices to enhance overall customer experience such as unparalleled reliability, best in class operational flexibility, and a wide gamut of value added features and functionalities that offer operational visibility like never before.

The company's relentless focus on customer service is evident by its industry leading net promoter score (NPS). QTS recorded an exceptional NPS of 88, which is nearly double the NPS average score for data centre service providers in the US. This demonstrates the extraordinary level of customer satisfaction provided by the company. On top of best in class customer service, QTS also has inspiring sustainability best practices in place with specific focus on three aspects – environmental, social, and governance. The company has in place a commitment to be powered 100% by renewables by 2025. It also has a goal to achieve LEED certification at 90% of QTS properties by 2025, conserve a minimum of 10 million gallons of water per year, and recycle 600 million pounds of material by 2025. It is noteworthy that QTS was ranked number 1 among global data centre companies in the 2019 Global Real Estate Sustainability Benchmark (GRESB) report. It is encouraging to see the company go the extra mile on its sustainability initiatives; for instance, it has committed to plant 1 tree per month for every 100KW that a customer signs with them.

QTS's growth performance is validated by its significant strides over the past three years in terms of revenue growth. The company registered a 14% growth rate in 2019 to reach \$480 million in revenue. QTS also achieved record revenue, EBIDTA and all-time high stock price during COVID 19. On the other hand, its record leasing in Q4 2019 created a strong momentum to kick off 2020 with a substantial pipeline and order backlog. Between Q4 2018 and Q4 2019, the company registered a 49% growth rate in backlog. It is also impressive to see QTS achieving 86% growth rate on average incremental annualized rent signed by quarter between 2017 and 2019. The other key metric that demonstrates QTS's excellence in growth performance is its stock growth rate; its share price increased from \$32 in 2018 to \$69.2 currently.

Seamless Vision Alignment

One of the most intriguing facets of QTS is its steadfast determination and unrelenting pursuit to enrich customer value and experience; it achieves this by leaving no stone unturned when it comes to technology and innovation. This is demonstrated by its methodical R&D and engineering initiatives aimed at reinforcing and advancing its vision of creating truly unique and path breaking data centre infrastructure, operations, and

management solutions that are not only highly reliable, but are also futuristic. Two aspects clearly stood out during the course of the research - QTS's unwavering focus on each of its thoroughly vetted strategic priorities and the sheer passion of its executive team to make it a reality; this is a perfect combination that Frost & Sullivan believes will elevate the company to further heights. QTS's vision 2025 represents the cloudification of what the company has been doing for the past two years and its action plan for the next five years. This vision is characterized by its unique three pronged go-to-market (GTM) strategy and underpinned by its value differentiators namely SDP, Sustainability, NPS, and Connectivity.

Two years ago QTS announced a major restructuring of its business model where it took a strategic decision to drop its managed services business and focus on its core competencies. This was because the company realized it was difficult to scale at margin, and it's subject to a fair amount of churn. Even though this was a major shift for the company, the way it impeccably aligned its board, shareholders, executive team, and the staff with this new strategy is highly commendable. As a part of this restructuring, the company laid out a unique GTM strategy aimed at diversifying its customer base. At that same time, QTS also started deploying capital at a higher percentage of revenue than its peers in the industry. By anticipating future customer needs and demands, the company took a deliberate investment decision to deploy the right infrastructure in strategic markets. Over the last four years, it went from building one new facility every two years to building two facilities every one year. Moreover, it owns 750 acres of land banks in key strategic markets for future development.

From a GTM perspective, QTS targets three segments: hyperscale, hybrid colocation, and federal. Given that each of these segments has different needs and buying patterns, QTS developed vertical-based differentiators to drive success in each segment. The company leverages hyperscale segment as a growth accelerant to bring in long term contracts and high credit quality tenants. However, QTS's revenue growth is not affected when there is a hiatus in hyperscaler's spending, thanks to its diversified GTM approach. The hybrid colocation segment is the core of QTS where it has a strong foothold. It leverages this segment to bring in diversified customers and take advantage of the steady and consistent revenues with higher returns. The next segment is federal, where QTS is the leading provider with established expertise. Its key differentiators in this space include a high end security & compliance platform, combined with operational expertise of the highest magnitude. This is a direct result of the company's investment in classified expertise since seven years ago. This set of differentiation (combined with its proven track record in this vertical) has enabled it to create stiff entry barriers for other players.

Unmatched Technological Sophistication

QTS's vast technology know-how and engineering expertise has allowed it to create industry leading data centre infrastructure solutions, specifically designed to enrich customer value. The company has gone to great lengths to ensure reliability, resilience, flexibility and visibility of the highest magnitude by leveraging cutting edge processes and tools in its product development stages. Frost & Sullivan analysts believe that QTS has

high potential to further fortify its position in the market with its revolutionary data centre infrastructure solutions, enabled by its far reaching innovation strategies.

A perfect example to demonstrate QTS's excellence in this aspect is QTS Innovation Lab (QIL), which was created as a natural extension and incubator for SDP. At the core of QIL there are dedicated resources leveraging cutting edge technologies such as AI, ML, and big data to ideate, conceptualize, and develop innovative, first-to-market solutions that would significantly enhance the way customers interact with QTS's data centre infrastructure. QTS employs a highly agile methodology to gauge the viability of these product sets on multiple fronts (technical viability, commercial viability, etc.); the even more interesting aspect is that the minimally viable product concept is turned into a real working prototype in just four weeks. The 3D mapper and predictive power discussed in the above sections were born out of QIL.

Other unique offerings from QIL include project parley, which enables interface for SDP via Slack by leveraging AI. It enables users to keep constant track of their data centre performance just with a simple Slack conversational interface. Project isobar is another fine example, which uses the same concept as predictive power, but is temperature based. It leverages AI to predict temperature based on power consumption where real time temperature is displayed in a 3D heat map with past and future predictive modelling. Next is project 4th wall, where the company is making its smart hands and eyes product offering even smarter. This is essentially a collaboration tool that enables up to eight people to share and visualize real-time data, images, and videos of data centre assets from remote locations. Finally there is project B-Roll which leverages AI and ML to apply metadata including facial recognition and masking technology on to the camera footage to clearly show what each individual is doing in the data centre.

Human Capital and Company Culture

QTS's brand name is synonymous with technology excellence, innovation, and most importantly, customer focus. The company has gained a reputed standing and has carved a niche for delivering services and solutions of the highest standards and being a trusted partner to its stakeholders. QTS's tremendous effort towards building and strengthening brand equity is clearly evident in the level of confidence its customers place in the company. QTS' mission of "empowering people and technology" is driven by its core values that begin with integrity, character, and trust - and end with support of family, faith, and community volunteerism. As a part of its long term strategy, the company has established a culture that empowers its employees to pursue excellence and positively impact each other and surrounding communities. For instance, over the past year, QTS recorded the highest ever corporate donations to local charities (over \$725,000). Chad Williams, Founder and CEO of QTS, leads by example and sets the standard for company culture by living out QTS's core values to the best of his ability. He also believes that its people are the company's greatest strength, and he has inspired them to step up to challenges and offer their best to its customers and communities, demonstrating a firm commitment to a culture of service.



Conclusion

Frost & Sullivan concludes that QTS's visionary innovation in the data centre industry is nothing short of remarkable and is without a doubt a boon to the end users. The level of passion and dedication the company has towards enhancing client value and customer experience is certainly astounding. It not only excels at technology and innovation, but also leads the way in customer service.

QTS has clearly differentiated itself in a highly competitive market and has emerged as a distinguished player. Frost & Sullivan's analysis confirms that QTS's SDP is a momentous step forward in the right direction which marks a corner stone in the evolution of data centre infrastructure, operations and management. With this first mover advantage, QTS has gained a unique edge and has created a leadership position. Frost & Sullivan firmly believes that SDP will be instrumental in elevating QTS's leadership position to further heights in the coming years.

With its strong overall performance, QTS has earned the 2020 Frost & Sullivan Global Visionary Innovation Leadership Award.

Significance of Visionary Innovation Leadership

A Visionary Innovation Leadership position enables a market participant to deliver competitive products and solutions that transform the way individuals and businesses perform their daily activities. Such products and solutions set new, long-lasting trends in how technologies are deployed and consumed by businesses and end users. Most importantly, they deliver unique and differentiated benefits that can greatly improve business performance as well as individuals' work and personal lives. These improvements are measured by customer demand, brand strength, and competitive positioning.



Understanding Visionary Innovation Leadership

Visionary innovation is the ability to innovate today in light of perceived changes and opportunities that will arise from Mega Trends in the future. It is the ability to scout for and detect unmet (and as yet undefined) needs and proactively address them with disruptive solutions that cater to new and unique customers, lifestyles, technologies, and markets. At the heart of visionary innovation is a deep understanding of the implications and global ramifications of Mega Trends, leading to the correct identification and ultimate capture of niche and white space market opportunities.



Key Benchmarking Criteria

For the Global Visionary Innovation Leadership Award, Frost & Sullivan analysts independently evaluated 2 key factors—Focus on the Future and Best Practices Implementation—according to the criteria identified below.

Focus on the Future

Criterion 1: Focus on Unmet Needs

Criterion 2: Visionary Scenarios through Mega Trends

Criterion 3: Growth Pipeline

Criterion 4: Blue Ocean Strategy

Criterion 5: Growth Performance

Best Practices Implementation

Criterion 1: Vision Alignment

Criterion 2: Process Design

Criterion 3: Operational Efficiency

Criterion 4: Technological Sophistication

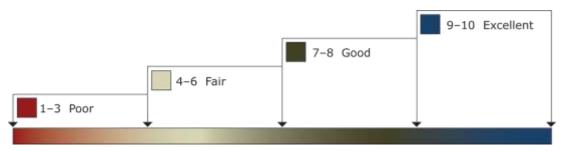
Criterion 5: Company Culture

Best Practices Award Analysis for QTS

Decision Support Scorecard

To support its evaluation of best practices across multiple business performance categories, Frost & Sullivan employs a customized Decision Support Scorecard. This tool allows research and consulting teams to objectively analyze performance according to the key benchmarking criteria listed in the previous section, and to assign ratings on that basis. The tool follows a 10-point scale that allows for nuances in performance evaluation. Ratings guidelines are illustrated below.

RATINGS GUIDELINES



The Decision Support Scorecard considers Focus on the Future and Best Practices Implementation (i.e., the overarching categories for all 10 benchmarking criteria; the definitions for each criterion are provided beneath the scorecard). The research team confirms the veracity of this weighted scorecard through sensitivity analysis, which confirms that small changes to the ratings for a specific criterion do not lead to a significant change in the overall relative rankings of the companies.



The results of this analysis are shown below. To remain unbiased and to protect the interests of all organizations reviewed, Frost & Sullivan has chosen to refer to the other key participants as Competitor 2 and Competitor 3.

Measurement of 1–10 (1 = poor; 10 = excellent)			
Visionary Innovation Leadership	Focus on the Future	Best Practices Implementation	Average Rating
дтѕ	9.0	9.5	9.25
Competitor 2	7.0	7.0	7.00
Competitor 3	6.0	7.0	6.50

Focus on the Future

Criterion 1: Focus on Unmet Needs

Requirement: Implementing a robust process to discover customers' unmet or underserved needs and create the products or solutions to address them effectively.

Criterion 2: Visionary Scenarios through Mega Trends

Requirement: Incorporating long-range, macro-level scenarios into the innovation strategy, thereby enabling first-to-market growth opportunity solutions

Criterion 3: Growth Pipeline

Requirement: Best-in-class process to identify and prioritize growth opportunities leveraging both internal and external sources.

Criterion 4: Blue Ocean Strategy

Requirement: Strategic focus on creating a leadership position in a potentially uncontested market space, manifested by stiff barriers to entry for competitors.

Criterion 5: Growth Performance

Requirement: Growth success linked tangibly to new growth opportunities identified though visionary innovation.

Best Practices Implementation

Criterion 1: Vision Alignment

Requirement: The executive team is aligned with the organization's mission, vision, strategy, and execution.

Criterion 2: Process Design

Requirement: Processes support the efficient and consistent implementation of tactics designed to implement the strategy.

Criterion 3: Operational Efficiency

Requirement: Staff performs assigned tasks seamlessly, quickly, and to a high quality standard.



Criterion 4: Technological Sophistication

Requirements: Systems enable companywide transparency, communication, and efficiency.

Criterion 5: Human Capital and Company Culture

Requirement: The executive team sets the standard for commitment to customers, quality, and staff, which translates directly into front-line performance excellence.

Decision Support Matrix

Once all companies have been evaluated according to the Decision Support Scorecard, analysts then position the candidates on the matrix shown below, enabling them to visualize which companies are truly breakthrough and which ones are not yet operating at best-in-class levels.



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Best Practices Recognition: 10 Steps to Researching, Identifying, and Recognizing Best Practices

Frost & Sullivan analysts follow a 10-step process to evaluate Award candidates and assess their fit with select best practices criteria. The reputation and integrity of the Awards are based on close adherence to this process.

STEP		OBJECTIVE	KEY ACTIVITIES	OUTPUT
1	Monitor, target, and screen	research		Pipeline of candidates that potentially meet all best practices criteria
2	Perform 360-degree research	Perform comprehensive, 360-degree research on all candidates in the pipeline	 Interview thought leaders and industry practitioners Assess candidates' fit with best practices criteria Rank all candidates 	Matrix positioning of all candidates' performance relative to one another
3	Invite thought leadership in best practices	Perform in-depth examination of all candidates	 Confirm best practices criteria Examine eligibility of all candidates Identify any information gaps 	Detailed profiles of all ranked candidates
4	Initiate research director review	Conduct an unbiased evaluation of all candidate profiles	 Brainstorm ranking options Invite multiple perspectives on candidates' performance Update candidate profiles 	Final prioritization of all eligible candidates and companion best practices positioning paper
5	Assemble panel of industry experts	Present findings to an expert panel of industry thought leaders	Share findingsStrengthen cases for candidate eligibilityPrioritize candidates	Refined list of prioritized Award candidates
6	Conduct global industry review	Build consensus on Award candidates' eligibility	 Hold global team meeting to review all candidates Pressure-test fit with criteria Confirm inclusion of all eligible candidates 	Final list of eligible Award candidates, representing success stories worldwide
7	Perform quality check	Develop official Award consideration materials	 Perform final performance benchmarking activities Write nominations Perform quality review 	High-quality, accurate, and creative presentation of nominees' successes
8	Reconnect with panel of industry experts	Finalize the selection of the best practices Award recipient	Review analysis with panelBuild consensusSelect recipient	Decision on which company performs best against all best practices criteria
9	Communicate recognition	Inform Award recipient of recognition	 Present Award to the CEO Inspire the organization for continued success Celebrate the recipient's performance 	Announcement of Award and plan for how recipient can use the Award to enhance the brand
10	Take strategic action	Upon licensing, company is able to share Award news with stakeholders and customers	 Coordinate media outreach Design a marketing plan Assess Award's role in strategic planning 	Widespread awareness of recipient's Award status among investors, media personnel, and employees

The Intersection between 360-Degree Research and Best Practices Awards

Research Methodology

Frost & Sullivan's 360-degree research methodology represents the analytical rigor of the research process. It offers a 360-degree view of industry challenges, trends, and issues by integrating all 7 of Frost & Sullivan's research methodologies. Too often companies make important growth decisions based on a narrow understanding of their environment, resulting in errors of both omission and commission. Successful growth strategies are founded on a thorough understanding of market, technical, economic, financial, customer, best practices, and demographic analyses. The integration of these research disciplines into the 360-degree research methodology provides an evaluation platform for benchmarking industry



players and for identifying those performing at best-in-class levels.

About Frost & Sullivan

Frost & Sullivan, the Growth Partnership Company, helps clients accelerate growth and achieve best-in-class positions in growth, innovation, and leadership. The company's Growth Partnership Service provides the CEO and the CEO's growth team with disciplined research and best practices models to drive the generation, evaluation, and implementation of powerful growth strategies. Frost & Sullivan leverages nearly 60 years of experience in partnering with Global 1000 companies, emerging businesses, and the investment community from 45 offices on 6 continents. To join Frost & Sullivan's Growth Partnership, visit http://www.frost.com.