



*Cellwize Recognized as the*

**2021**

**Entrepreneurial Company of the Year**

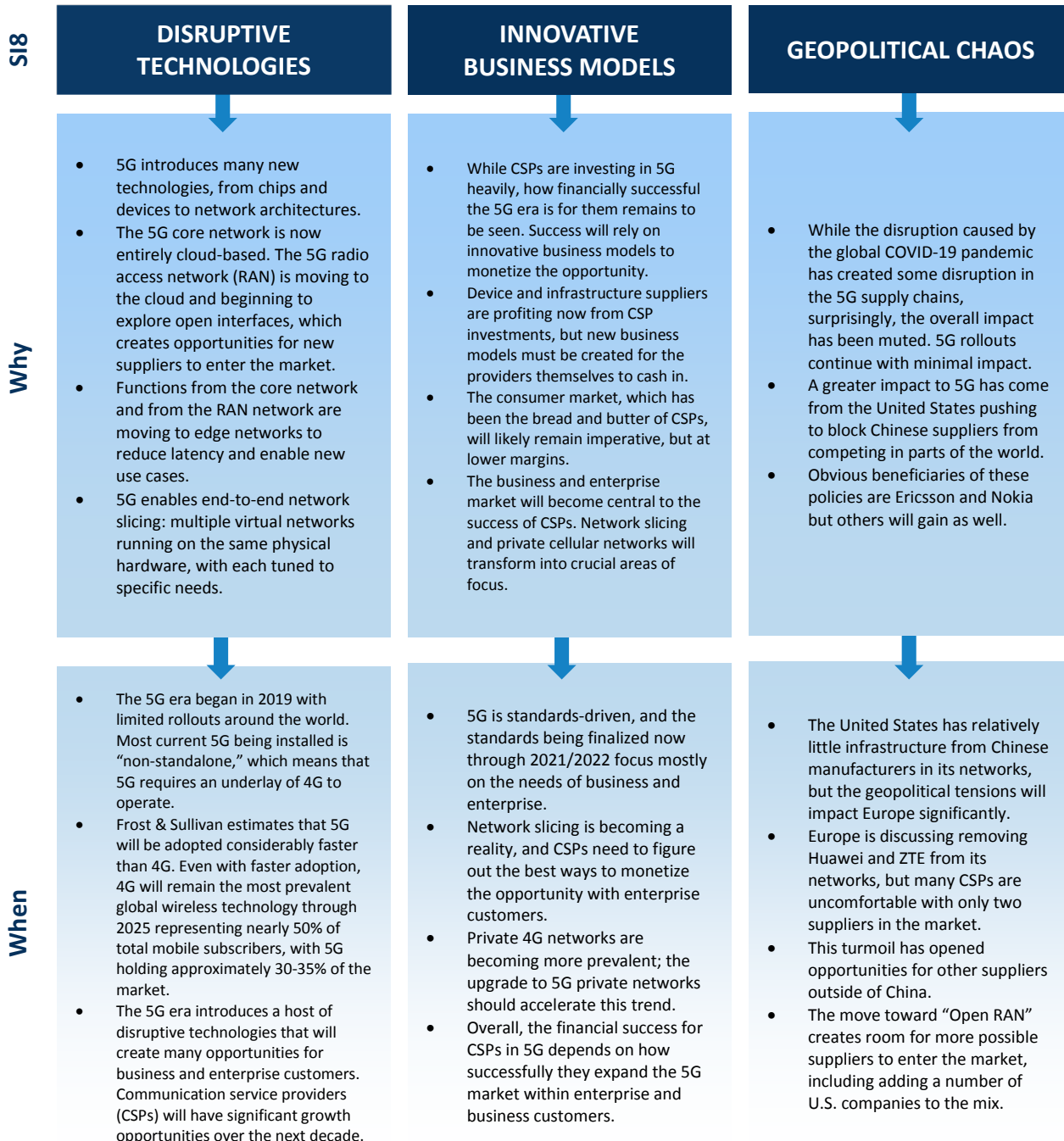
Global Open RAN

Orchestration Industry

*Excellence in Best Practices*

## Strategic Imperatives

Frost & Sullivan identifies three key strategic imperatives that impact the 5G infrastructure industry: disruptive technologies, innovative business models, and geopolitical chaos. Every company that is competing in the 5G infrastructure space is obligated to address these imperatives proactively; failing to do so will almost certainly lead to stagnation or decline. Successful companies overcome the challenges posed by these imperatives and leverage them to drive innovation and growth. Frost & Sullivan’s recognition of Cellwize is a reflection of how well it is performing against the backdrop of these imperatives.



## Best Practices Criteria for World-Class Performance

Frost & Sullivan applies a rigorous analytical process to evaluate multiple nominees for each award category before determining the final award recipient. The process involves a detailed evaluation of best practices criteria across two dimensions for each nominated company. Cellwize excels in many of the criteria in the open RAN orchestration space.

AWARD CRITERIA	
<i>Entrepreneurial Innovation</i>	<i>Customer Impact</i>
Market Disruption	Price/Performance Value
Competitive Differentiation	Customer Purchase Experience
Market Gaps	Customer Ownership Experience
Leadership Focus	Customer Service Experience
Passionate Persistence	Brand Equity

### *Expected Benefits of 5G Creates New Revenue Streams in the RAN Market*

The 5G era introduces a host of disruptive technologies that create unique growth opportunities for business and enterprise customers. Accelerated by the COVID-19 pandemic (which highlighted the importance of remote communications), network operators recognize the need to expedite their 5G planning and implementation. Frost & Sullivan analysts estimate that global communication service providers (CSPs) invest annually between \$50 to \$60 billion on mobile and wireless network infrastructure, with spending increasingly focused on the radio access network (RAN).<sup>1</sup> Hence, CSPs and their suppliers see significant growth opportunities as 5G technology tips into the mainstream and RANs evolve. More specifically, Frost & Sullivan expects open and virtual RAN to soon become the largest portion of the overall global RAN market. Along with the expected benefits of 5G (such as improved connectivity, enhanced capacity, near-zero latency, and edge-enabled use cases), the shift towards open RAN creates new revenue streams and helps offset the costs of next-generation network deployments. With every new generation, the changes are significant enough to require updated devices to access the latest wireless technology; for example, a 4G device cannot access a 5G network. A 5G device, however, is backward compatible and can access 5G networks and previous generations of network technologies. 5G is designed to use the radio frequency spectrum differently and more efficiently; for this reason, 5G is referred to as 5G New Radio (NR).

<sup>1</sup> Frost Radar™ 5G Network Infrastructure Market, 2020 (January 2021, Frost & Sullivan)

Although we are entering the 5G era, there should be no expectations that previous generations of wireless technology will disappear. According to Frost & Sullivan projections, 4G LTE will remain the dominant technology around the world by number of subscribers through at least 2025, the last year projected. In 2025, 4G LTE is projected to have the most global subscribers (at almost 50%), followed by 5G NR (at more than 31%), with 2G and 3G still accounting for a significant number of subscribers (almost 19%). Currently, most 5G implementations are ‘non-standalone’. This means an underlay of 4G is still required for the network to operate. This architecture creates an opportunity for new market entrants offering solutions that facilitate the seamless integration between the 4G and 5G layers to deliver the high-level capabilities that will progressively redesign the mobile landscape.

Frost & Sullivan research reveals that prominent global CSPs are leading the movement toward an open and virtual RAN, strengthened by the following drivers<sup>2</sup>:

- Open and virtual RAN enables disparate hardware and software to seamlessly work together, eliminating vendor ‘lock-in’. It can also efficiently scale up (and down).
- The capability to deploy RAN software remotely saves time and significantly reduces overall installation and routine maintenance costs.
- A more competitive environment inherently leads to lower costs and speeds up innovation, which is essential as RAN expenses account for the largest percentage of CSPs overall network cost.
- Many global CSPs have underserved coverage areas, mostly rural, primarily because the economics to expand coverage in these areas are not profitable. Commitments to governments or local authorities to better serve these communities through open RAN can improve sustainability.
- As the lifecycles of existing networks end, CSPs consolidate 2G, 3G, and 4G to provide an easier upgrade path.

### ***Entrepreneurial Innovation and Customer Impact of Cellwize***

While intensified competition leads to lower costs, a multitude of distinct software and/or hardware providers creates complexity that requires systems integration, which adversely impacts costs. As a forward-looking vendor, Cellwize addresses this challenge by partnering with CSPs to develop the open RAN technology market. Entering the scene in 2013 as a solution provider of centralized self-organizing networks (SON), Cellwize expanded its focus from optimizing to managing and automating the RAN by implementing SON principles across the heterogeneous network and application layers. Cellwize’s CHIME platform (a cloud-based vendor-agnostic solution previously recognized by Frost & Sullivan in the category of Product Line Strategy Leadership) integrates RAN technologies with advanced network automation to reduce costs, enhance fast time to market and increase interoperability. With its cloudified, open microservices-based architecture, this management and automation platform addresses many use cases via flexible application-programming interface (API)-driven business models to enable go-to-market strategies that are region and operator-specific. This interface enables self-development, which supports the move to CI/CD, and therefore allows the RAN to become programable. Hence, it reduces the turnaround time of 5G deployments in a multi-vendor RAN environment to accelerate customers’ business outcomes.

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<sup>2</sup> *Open and Virtual Radio Access Networks: Technology Evolutions Leads to Significant Growth Opportunities during the 5G era* (Frost & Sullivan, August 2020)

### ***Building a Robust Ecosystem with Leading Partners***

As 5G contains multiple levels of complexities (including multi-band, multi-technology, multi-layer, multi-architecture, and multi-RAN players), automation at both network-level and throughout all business processes is a critical success factor in operators' rollout strategies. Serving more than 30 customers across the Americas,

*“With its cloudified, open microservices-based architecture, this management and automation platform addresses many use cases via flexible application-programming interface (API)-driven business models to enable go-to-market strategies that are region and operator-specific. Hence, it reduces the turnaround time of 5G deployments in a multi-vendor RAN environment to accelerate customers' business outcomes.”*

***- Brent Iadarola, Vice President, ICT***

Europe, and Asia Pacific (including mobile and network operators such as Verizon, Bell, Telefónica, Deutsche Telekom, Singtel, and Axiata), Cellwize also collaborates with leading partners and system integrators.

Within its RAN-oriented approach, Cellwize purposefully builds a robust ecosystem that allows the company to leverage each partner's key capabilities to personalize its offering for end users. Furthermore, Cellwize's diverse set of board members and investors (representing Qualcomm, Intel, Samsung, Verizon, Deutsche Telekom, Capital Partners, VMware, and Viola) reflects its hefty backing and credible presence in the market.

Cellwize's core differentiation is its open network applications and development ecosystem that allows the operator to thrive in an increasingly vertically-integrated multi-vendor environment. For instance, Cellwize helped Telefónica Germany to consolidate two networks and integrate five different vendors across 2G, 3G, and 4G. As such, Cellwize is well-equipped to roll out 5G without being affected by other vendors' latest releases and features.

Cellwize also participated in Verizon's rollout of Samsung's new dynamic spectrum sharing feature between 4G and 5G. To orchestrate, manage, and execute services regardless of the underlying infrastructure and technologies, the Cellwize solution deals with different data sources and data types to create an abstract of simplified and exposed models through open API's toward the applications. By adding two core elements to its solution, Cellwize addresses the numerous algorithms across different vendors. It leverages artificial intelligence algorithms and high-level automation technology to guarantee consistent quality without manual inputs. The first dimension is called contextual automation, a mechanism that triggers any application, such as vertical applications based on a threshold-crossing event or an external source (e.g., a message from an enterprise message bus that triggers a specific context).

To bundle different algorithms or different business logics together, Cellwize developed a set of automated recipe services that allow customers or users to build their own recipes, leveraging their assets on top of the platform.

Deploying these two key ingredients enables the platform to configure the cell into a coherent functioning mode within a production environment (addressing multiple carriers' policies), all in a single flow. By disconnecting the business logic and making it RAN-agnostic, Cellwize develops infrastructure components as a service across the topology configuration (including thousands of parameters per cell per node).

The abstracted and simplified model also expresses the performance of a technical key performance indicator (KPI) across different available brands. Although Cellwize has models that predict KPIs, not all KPIs are created equally and hold high-accuracy predictability. Hence, Cellwize also provides a confidence score alongside the predictive KPI, enabling the algorithm or business logic to incorporate the data confidence score when using the data. Moreover, moving from a static policy to one that is adaptive through an enhanced artificial intelligence/machine learning (AI/ML)-type of governance provides carriers with significant flexibility to avoid vendor lock-ins.

*“Networks use several infrastructure vendors, each with its own code. With Cellwize’s open RAN application platform, developers no longer have to learn individual vendor codes or keep up with changes in vendors’ distinct codes to develop for Verizon’s network. It simplifies their efforts to help us stay on the cutting edge of innovation by eliminating the need to keep up with different and changing data models, structures, and naming conventions. It gives them a neutral platform on which to develop innovations to improve the network for our customers.”*

**Bill Stone, Vice President of Planning for Verizon**

To conclude, the CHIME cloudified platform ingests raw data before enriching vendor-specific data with AI/ML to transform and orchestrate it into an open abstracted data model, implementing changes across RAN architectures, vendors, and technologies before accelerating it via the API gateway across all network vendors and elements. This integrated approach, underpinned by an open mindset, provides valuable insights, enabling developers to support the move to CI/CD, and innovate and prompt industry bodies to push the standards forward.

#### **Use Case: 5G Deployment by a Tier-1 North American Network Operator**

*“Cellwize’s CHIME platform allows automation at both network-level and throughout all business processes. After building the new site physically, it is ready to be connected and can be quickly configured remotely.”*

**- Riana Barnard, Research Analyst  
Frost & Sullivan**

**The challenge:** A 5G deployment by a Tier-1 North American Network Operator is time-consuming (accounting for 18 to 20 person-weeks, 4 to 8 calendar weeks) and expensive (including a minimum of three truck rolls). As network parameters freeze the site and neighbor cells’ parameter status for 3 to 5 weeks to carry out the necessary steps associated with the deployment (i.e., planning, commissioning, pre-activation), the operator also has to budget a final site visit before activation and acceptance tests can take place.

**The Cellwize offering:** Cellwize’s CHIME platform allows automation at both network-level and throughout all business processes. After building the new site physically, it is ready to be connected and can be configured remotely.

**The results:** Utilizing Cellwize’s CHIME platform, the Tier-1 North American Network operator triggered the CHIME Deployer into action, starting the pre-activation process and configuring the cell according to the policy when the cell is up. As all steps are done in the field, the client saves planning time and improves quality. The client also monitors and optimizes cell configurations over initial uptime; therefore, Cellwize reduced the turnaround time to one truck roll and a 15-minute site deployment.

## Conclusion

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Global communication service providers and their suppliers see significant growth opportunities as 5G technology tips into the mainstream, and open and virtual RANs evolve. However, 5G contains multiple levels of complexities (including multi-band, multi-technology, multi-layer, multi-architecture, and multi-RAN players). Hence, automation at both network-level and throughout all business processes is a critical success factor in operators' rollout strategies. Geared to integrate different layers of the 5G network deployment with the predominantly used 4G network, Cellwize demonstrates that its cloudified vendor-agnostic platform can effortlessly scale across different parts of various networks and automate a considerable part of the network process. Many use cases confirm Cellwize's key value proposition, i.e., its platform's capability to self-develop in a closed-loop environment. While engineers and developers can create their own algorithms and applications, Cellwize's advanced technology automates the entire multi-vendor radio access network (RAN) ecosystem through open application programming interfaces, turning the RAN from a monolithic environment into a programmable open RAN.

With its passionate persistence and advanced technology, leveraged by a pragmatic approach and best-in-class implementation practices, Cellwize earns Frost & Sullivan's 2021 Global Entrepreneurial Company of the Year Award in the open RAN orchestration market.

## What You Need to Know about the Entrepreneurial Company of the Year Recognition

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Frost & Sullivan's Entrepreneurial Company of the Year Award recognizes the best up-and-coming, potentially disruptive market participant.

### Best Practices Award Analysis

For the Entrepreneurial Company of the Year Award, Frost & Sullivan analysts independently evaluated the criteria listed below.

#### *Entrepreneurial Innovation*

**Market Disruption:** Innovative new solutions have a genuine potential to disrupt the market, render current solutions obsolete, and shake up competition

**Competitive Differentiation:** Strong competitive market differentiators created through a deep understanding of current and emerging competition

**Market Gaps:** Solution satisfies the needs and opportunities that exist between customers' desired outcomes and their current market solutions

**Leadership Focus:** Company focuses on building a leadership position in core markets and on creating stiff barriers to entry for new competitors

**Passionate Persistence:** Tenacity enables the pursuit and achievement of seemingly insurmountable industry obstacles

#### *Customer Impact*

**Price/Performance Value:** Products or services provide the best value for the price compared to similar market offerings

**Customer Purchase Experience:** Quality of the purchase experience assures customers that they are buying the optimal solution for addressing their unique needs and constraints

**Customer Ownership Experience:** Customers proudly own the company's product or service and have a positive experience throughout the life of the product or service

**Customer Service Experience:** Customer service is accessible, fast, stress-free, and high quality

**Brand Equity:** Customers perceive the brand positively and exhibit high brand loyalty



## About Frost & Sullivan

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## The Growth Pipeline Engine™

Frost & Sullivan's proprietary model to systematically create on-going 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 six analytical perspectives are crucial in capturing the broadest range of innovative growth opportunities, most of which occur at the points of these perspectives. Learn more.

### Analytical Perspectives:

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

