# FROST & SULLIVAN

## BEST PRACTICES

### AWARDS

FROST & SULLIVAN

2020 BEST PRACTICES AWARD

cellwize
automation that enables

## 2020 GLOBAL
## RADIO ACCESS NETWORK AUTOMATION
## PRODUCT LINE STRATEGY LEADERSHIP AWARD

# Contents

# Background and Company Performance

## Industry Challenges

According to the Cisco Annual Internet Report (2018-2023) White Paper, nearly two-thirds of the global population will have Internet access by 2023, up from 51% in 2018. In addition, there will be 29.3 billion networked devices by 2023, up from 18.4 billion in 2018. To accommodate the surge in digital data created from the rise of Internet users and connected devices between 2018 and 2023, network operators will need to re-architect their existing network infrastructure significantly and ensure that capital investments do not spiral out of control.

The rise in the number of centralized radio access networks (C-RAN); the deployment of a large number of small cells and femtocells, which are placed strategically close to the subscriber; and the incorporation of network virtualization and software-defined networks are some of the many technologies that network operators have used to achieve the aforementioned objective. However, the degree of network heterogeneity and the multi-vendor nature have increased substantially as well, leading to a higher probability of interoperability and vendor lock-in issues.

The commercial rollout of limited 5G deployments and the eventual rollout of full 5G deployments that consist of enhanced mobile broadband (eMBB), massive machine type communications (mMTC), and ultra-reliable low latency communications (URLLC) will increase the quagmire of the network infrastructure and the time taken to get the new network up and running. The heterogeneous network would require a solution that can self-optimize the network and enhance the degree of automation in RAN based on the business application running on the network infrastructure.

The requirement for a differential degree of network automation that is based on the business process and application will be enhanced with the incorporation of several network slices for 5G network deployments.

## Product Line Strength and Customer Impact

### Brand Equity

Cellwize started operations in 2013 as a solution provider of centralized self-organizing networks (cSON). In the years that followed, Cellwize expanded its focus from optimizing the RAN to managing and automating the RAN itself, including implementing SON principles more efficiently across the heterogeneous network and application layers. The company culminated these new principles into the development of its Cellwize Chime platform, which was officially released in the market in 2019. Cellwize Chime is the company's flagship RAN management and automation platform that is completely cloud based and vendor agnostic, has an open micro-services based architecture to address many use cases, commercialized via flexible business models including a pay-as-you-use model.

With a workforce strength of 150 employees, Cellwize caters to a diverse range of mobile operators based across the Americas, Europe, and Asia-Pacific, including Verizon, Bell, Telefónica group, Deutsche Telekom group, Singtel group , Axiata group and many other global network operators. Companies such as Verizon and Deutsche Telekom are at the

forefront of the research and the eventual deployment of a fully automated 5G network. For example, by leveraging the Chime automation platform, operators can accelerate their 5G business, through mobile access automation, which enables 5G B2B management.

To enhance its outreach to potential customers worldwide, Cellwize is committed to building its global ecosystem of partners, including Tech Mahindra, Deloitte, and VMware. With its rising potential, Cellwize has secured funding from a number of leading venture capital firms, most notably are Deutsche Telekom Capital Partners (DTCP) and Viola, a prominent Israeli venture capitalist, Sonae IM and Vintage.

**Supply Chain Reliability**

Unlike its competitors, Cellwize forges unique partnerships with other technology firms because it does not treat them as system integrators. Rather, Cellwize leverages the key capabilities of each partner, which in turn allows it to customize its go-to-market strategy according to the region, thereby personalizing its offering for each end user.

As a notable partnership, Tech Mahindra is recognized for its technology consultancy expertise in the global telecommunications industry, which Cellwize is leveraging to build its go-to-market strategies that are custom to the technological maturity of both the network operator and the region in which the network operator is located.

Cellwize's unique partnership with Deloitte helps network operators with change management, which is essential when conducted during the deployment phase of the automation stack as well as throughout the value realization path

**Technology Leverage**

Cellwize's flagship product is a cloud-based platform that automates network operators' RAN. The platform enhances the openness of the RAN by collaborating with third-party open-radio access network (O-RAN) supply chain vendors, thereby integrating the legacy-based network with the new and more open network ecosystem.

Furthermore, the Chime platform ensures a greater degree of interoperability than competing solutions because it is engineered to consume data from the network operator's multi-vendor RAN environment, which could be built by traditional NEPs such as Ericsson, Nokia, Huawei, ZTE or Samsung. In addition, the platform connects with new entrants such as Mavenir, that are developing 3GPP-compliant interfaces and that are leading the way in the development and deployment of an O-RAN ecosystem, including the two broad interfaces called O1 and A1.

The Cellwize Chime platform ingests data from other external sources, such as commercially available crowdsourcing data providers. The information, which is both vendor and multi-vendor specific, is correlated with the other information using the platform's proprietary data mediation services. Cellwize Chime has enhanced artificial learning and machine learning capabilities, which change the information collected into a unified and open data model and exposes that data to Cellwize's open application programming interfaces (APIs), which then pass the information to the operator's many different applications that are

deployed on the legacy Radio Access Technologies, such as 2G, 3G, 4G, and the upcoming 5G deployment.

In this way, Cellwize's platform successfully reduces the operator's operating expenditure (OPEX) and the time-to-market of its 5G deployment and creates an open ecosystem for network deployments.

**Scalability**

The first phase of 5G deployment will mostly be non-standalone (NSA). The Cellwize Chime platform will automate the RAN, the platform is completely complementary with the backhaul, virtual network functions, and the software-defined network ecosystem. Cellwize Chime is geared to integrate several different layers of the 5G network deployment with the predominantly used 4G network, and Frost & Sullivan estimates that, on average, the Chime platform helps network operators save 60% of their OPEX, which would have otherwise been spent on getting the RAN operational. Such a model is not sustainable for 5G deployments, and this capability, in which the platform can easily scale across different parts of various networks and then automate a huge part of the network process, is where the platform outshines competing solutions.

**Features**

Chime, through its unique set of solutions automates the RAN across a wide variety of use cases. For example, by utilizing Optimizer & Designer. the RAN information model broadly consists of the following two parts: individual cell activity, which is unique and cannot be templatized, and a golden parameter list (GPL), which is custom to the network operator; when the operator incorporates a new type of deployment, the GPL changes, while the configuration specific to individual cells remains static.

One of the key value propositions of Cellwize's platform is utilizing the Chime Developer solution which offers the ability to self-develop, empowering engineers to create their own algorithms and apps and automate the entire multi-vendor RAN ecosystem through open APIs – turning the Radio Access Network from a monolithic environment to a programmable open RAN. Another example is, that with the Cellwize Chime Designer, the end user can automatically change the version of the GPL to align and adapt with the static parameters that are cell specific, thereby optimizing the RAN and enhancing its flexibility to handle sudden spikes in network traffic during key events. After the network engineer defines the network policies prior to deployment, Chime Designer solution will automatically monitor the set population, gauges what percentage of that population meets the policy condition, and then optimizes the network accordingly.

Cellwize Chime, therefore, moves from a static policy to one that is adaptive through an enhanced AI/ML-type of governance, which provides carriers with significant flexibility to avoid vendor lock-ins, without going to their incumbent vendor for solutions. In a multi-cloud environment that consists of edge compute and centralized clouds, with a number of virtualized network functions (VNFs) on the virtualized RAN (V-RAN), Cellwize Chime can seamlessly integrate the different components with each other across different environments.

## Conclusion

To accommodate the surge in digital data created from the rise of Internet users and connected devices, the RAN needs to be re-architected and should have a high degree of automation. The requirement for RAN automation will be enhanced with the deployment of 5G services. Without an automation solution for 5G RAN, the OPEX associated with its deployment will be exorbitant and unsustainable.

Through its Chime platform, Cellwize has pushed the envelope by engineering a solution that is easy to integrate into a multi-vendor RAN environment and to enhance its degree of automation and management. Cellwize's partnerships, such as with Tech Mahindra and Deloitte, have enabled it to create go-to-market strategies that are region and operator specific and reduce the turnaround time associated with implementing the solution in operators' RAN environments.

For its strong overall performance, Cellwize is recognized with Frost & Sullivan's 2020 Product Line Strategy Award in the global RAN automation industry.

## Significance of Product Line Strategy

Ultimately, growth in any organization depends on customers purchasing from a company and then making the decision to return time and again. A full, comprehensive product line that addresses numerous customer needs and preferences is, therefore, critical to a company's long-term retention efforts. To achieve the dual goals of customer value and product line strength, an organization must be best in class in 3 key areas: understanding demand, nurturing the brand, and differentiating from the competition.

- Acquire competitors' customers
- Increase renewal rates
- Increase upsell rates
- Build a reputation for value
- Increase market penetration

- Earn customer loyalty
- Foster strong corporate identity
- Improve brand recall
- Inspire customers
- Build a reputation for creativity

DEMAND

BRAND

Product Line Strategy Leadership

COMPETITIVE POSITIONING

- Stake out a unique market position
- Promise superior value to customers
- Implement strategy successfully
- Deliver on the promised value proposition
- Balance price and value

## Understanding Product Line Strategy Leadership

Driving demand, strengthening brand, and differentiating from the competition all play critical roles in delivering unique value to customers. This three-fold focus, however, must ideally be complemented by an equally rigorous focus on building a superior and comprehensive product line.

## Key Benchmarking Criteria

For the Product Line Strategy Leadership Award, Frost & Sullivan analysts independently evaluated Product Line Strength and Customer Impact according to the criteria identified below.

## Product Line Strength

### Criterion 1: Breadth
Requirement: Product line addresses the full range of customer needs and applications.

### Criterion 2: Scalability
Requirement: Product line offers products at a variety of price points and functionality levels.

### Criterion 3: Technology Leverage
Requirement: Demonstrated commitment to incorporating leading-edge technologies into product offerings results in greater product performance and value.

### Criterion 4: Features
Requirement: Products offer a comprehensive suite of features to serve customers at multiple levels of functionality, ease of use, and applications.

### Criterion 5: Supply Chain Reliability
Requirement: There is sufficient control over the supply chain to ensure availability of products and components.

## Customer Impact

### Criterion 1: Price/Performance Value
Requirement: Products or services offer the best value for the price, compared to similar offerings in the market.

### Criterion 2: Customer Purchase Experience
Requirement: Customers feel they are buying the optimal solution that addresses both their unique needs and their unique constraints.

### Criterion 3: Customer Ownership Experience
Requirement: Customers are proud to own the company's product or service and have a positive experience throughout the life of the product or service.

### Criterion 4: Customer Service Experience
Requirement: Customer service is accessible, fast, stress-free, and of high quality.

### Criterion 5: Brand Equity
Requirement: Customers have a positive view of the brand and exhibit high brand loyalty.

# 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** | Identify award recipient candidates from around the world | • Conduct in-depth industry research<br>• Identify emerging industries<br>• Scan multiple regions | 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<br>• Assess candidates' fit with best practices criteria<br>• 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<br>• Examine eligibility of all candidates<br>• 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<br>• Invite multiple perspectives on candidates' performance<br>• 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 findings<br>• Strengthen cases for candidate eligibility<br>• Prioritize 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<br>• Pressure-test fit with criteria<br>• 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<br>• Write nominations<br>• 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 panel<br>• Build consensus<br>• Select 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<br>• Inspire the organization for continued success<br>• 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<br>• Design a marketing plan<br>• 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 participants and for identifying those performing at best-in-class levels.



360-DEGREE RESEARCH: SEEING ORDER IN THE CHAOS

## 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.