

User Centric Data Correlation for Network Life cycle Automation

ITU- T QSDG Workshop, Gambia, 13th-14th March 2023

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infovista

KNOW YOUR NETWORK™

At a glance – who we are

An independent software vendor and global leader in network lifecycle automation and contact center assurance



1250+
CUSTOMERS



150+
COUNTRIES



800+
PROFESSIONALS



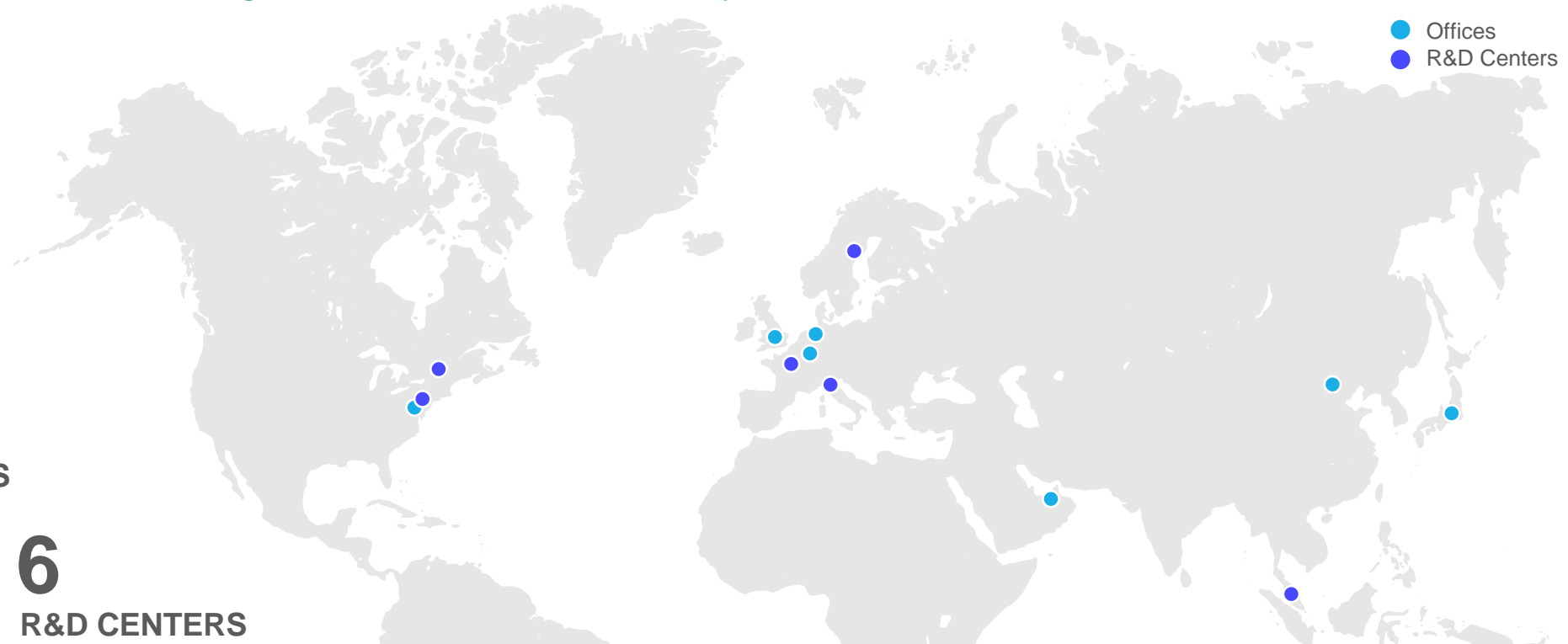
11
OFFICES



6
R&D CENTERS



2
BUSINESS UNITS



Plan, test, assure and monetize wireless and fixed networks

- 1,000+ Global CSPs and enterprise customers
- 400+ 5G customers
- 23 of top 30 CSPs globally

Monitor and test contact centers

- 250+ Enterprise customers
- 8 of top 10 health organizations
- 6 of top 10 financial institutions

We are a recognized innovator

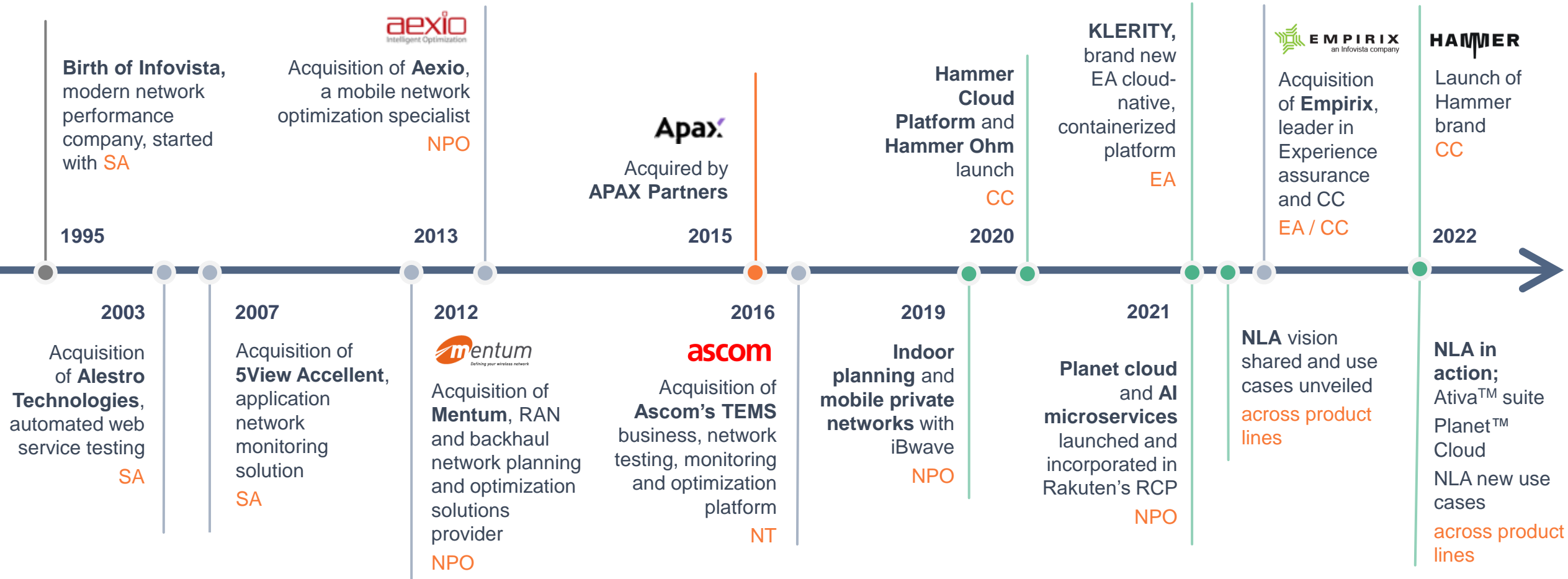
A selection of our 300+ CSP customers



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Historical key events



- Major product launches
- Acquisitions
- Major shareholder change



Definitions: NPO = Network Planning and Optimization (or Radio Engineering) // NT = Network Testing // SA = Service Assurance // EA = Experience Assurance // CC = Contact Center

Market-leading products & solutions across the network lifecycle

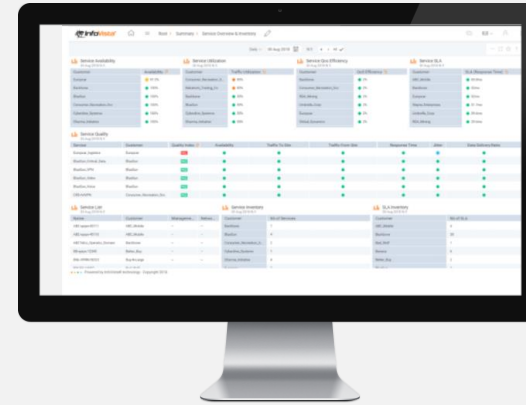
Leveraging 25 years of telecom experience in network planning, testing and assurance



- **Planet RAN Planning**
- **Eliipse Fixed Planning**
- **GeoData 3D real-world simulation**



- **TEMS Walk, Drive, and 24/7 Testing**



- **Ativa™ Automated Assurance and Operations** across applications, services, network and resources



- **Infovista Solutions** Subscriber behavior and preferences, application intelligence, service adoption and geospatial insights

Infovista is now the only ISV with all the capabilities needed to automate across the network lifecycle with a proven, class-leading, cloud-native portfolio

KNOW YOUR NETWORK

Planet Suite

Deliver exceptional RAN designs with the Planet Suite's RF, backhaul and digital map solutions

Planet

RF planning and optimization

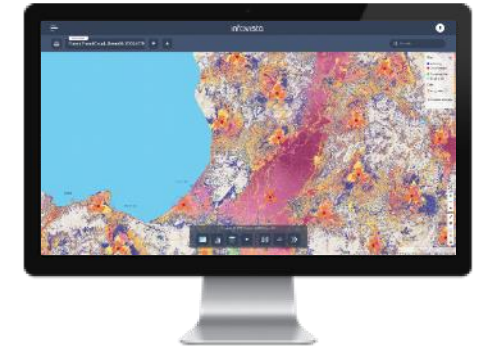
Increase radio design accuracy and accelerate 5G network roll-out



Planet Cloud

Cloud-based RF planning and optimization

Adopt cloud-native planning for performance, scalability and efficiency



Geodata

Maps for wireless network design

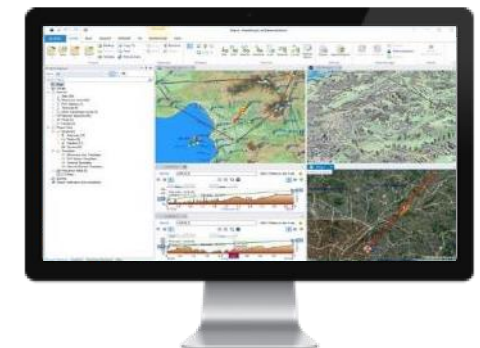
Accurately model your wireless network with modern geodata sets



Ellipse

Backhaul planning and optimization

Design backhaul network topologies, capacity and latency to support 5G



TEMS™ Suite

For over 25 years, TEMS™ has been recognized as the leading network testing solution by mobile network operators and vendors worldwide

Orchestration
and Analytics



TEMS™
Cloud

Cloud solution providing
orchestration and analytics



TEMS™
Director

Remote management and
analytics for TEMS solutions



TEMS™
Discovery

Network analytics and
optimization platform

Network
Testing



TEMS™
Investigation

Network testing and
troubleshooting solution

Drive testing



TEMS™
Pocket

Portable testing and
troubleshooting solution

Walk testing



TEMS™
Paragon

Mobile network
benchmarking solution

Benchmarking



TEMS™
Sense

Automated remote network
monitoring solution

Remote testing

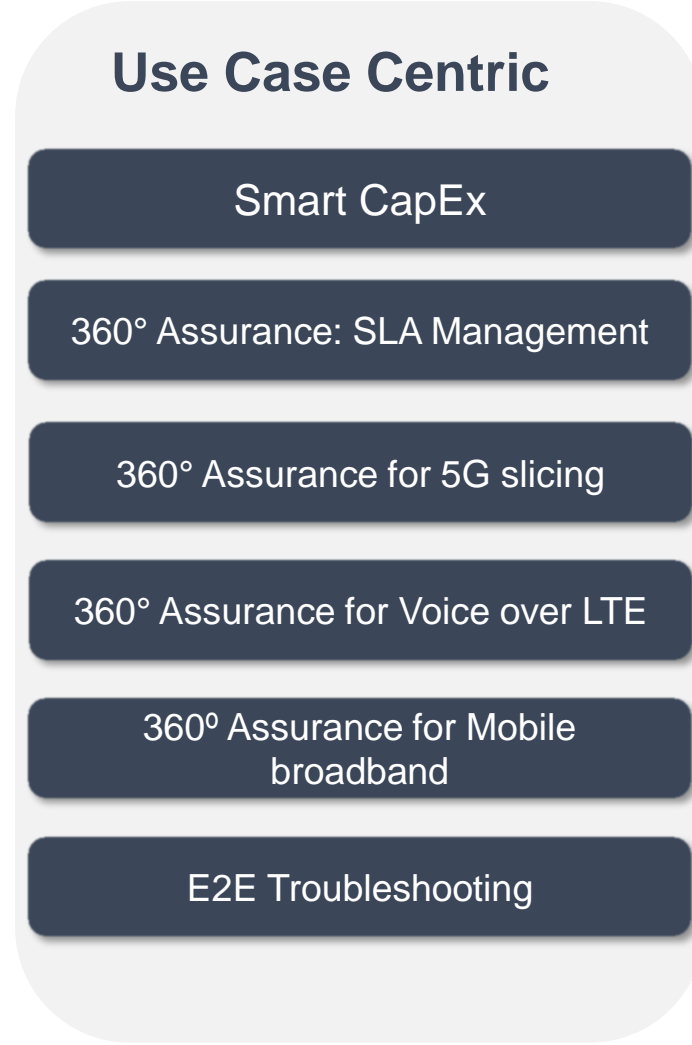
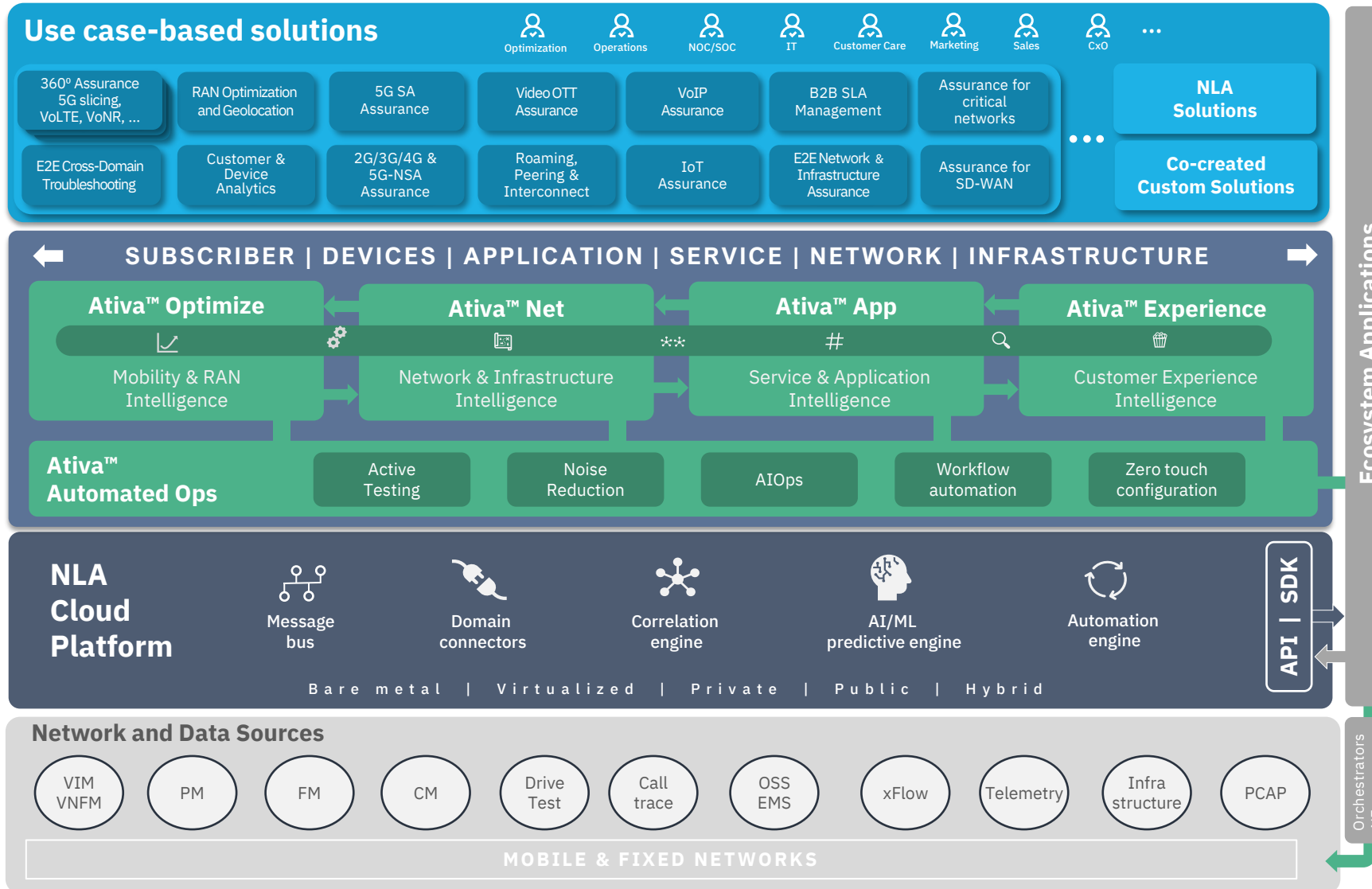


TEMS™
SSV

Automated 5G site
verification solution

Site verification

Ativa™ for Automated Assurance & operations



What we do

We use an open, integrated, cloud native Platform across our portfolio for Network Planning, Testing and Assurance, which automates tasks, flows, correlation, analysis, and decisions to the greatest extent possible.

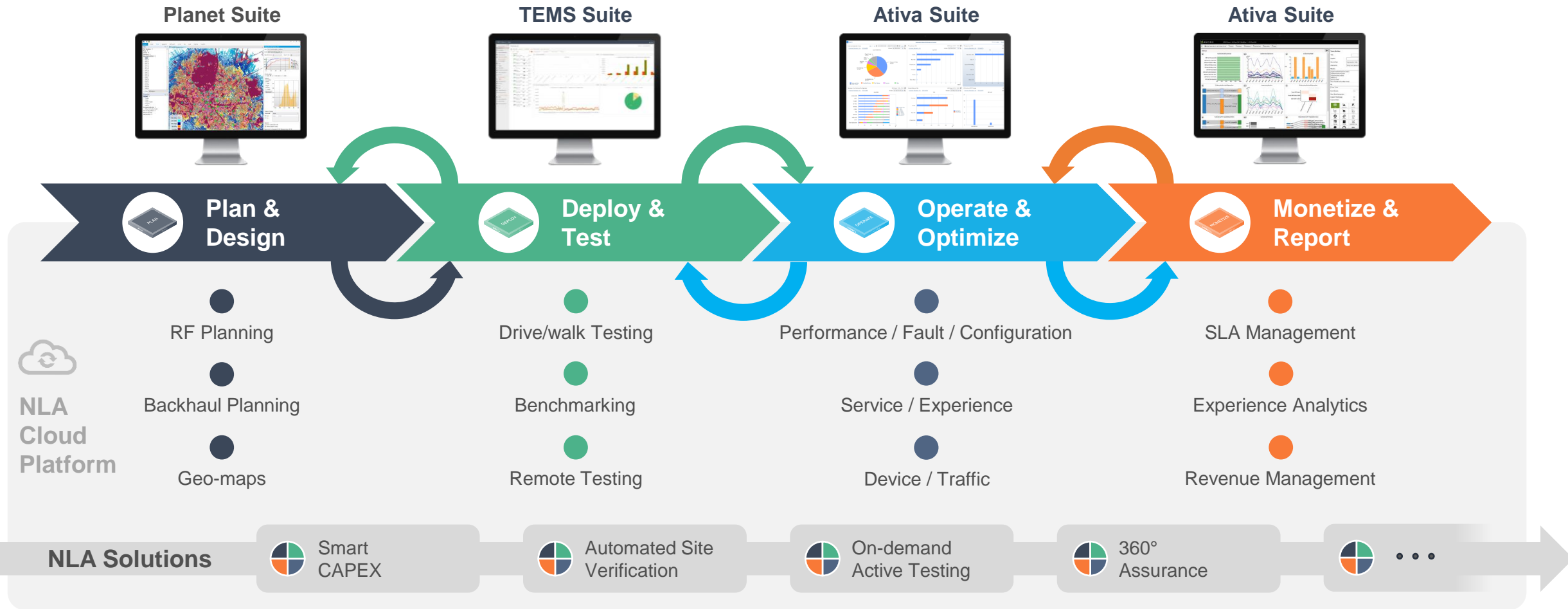
We call this Network Lifecycle Automation NLA.

This allows your teams to eliminate complexity, drive productivity, reduce time-to-market and monetize new services like 5G and IoT.



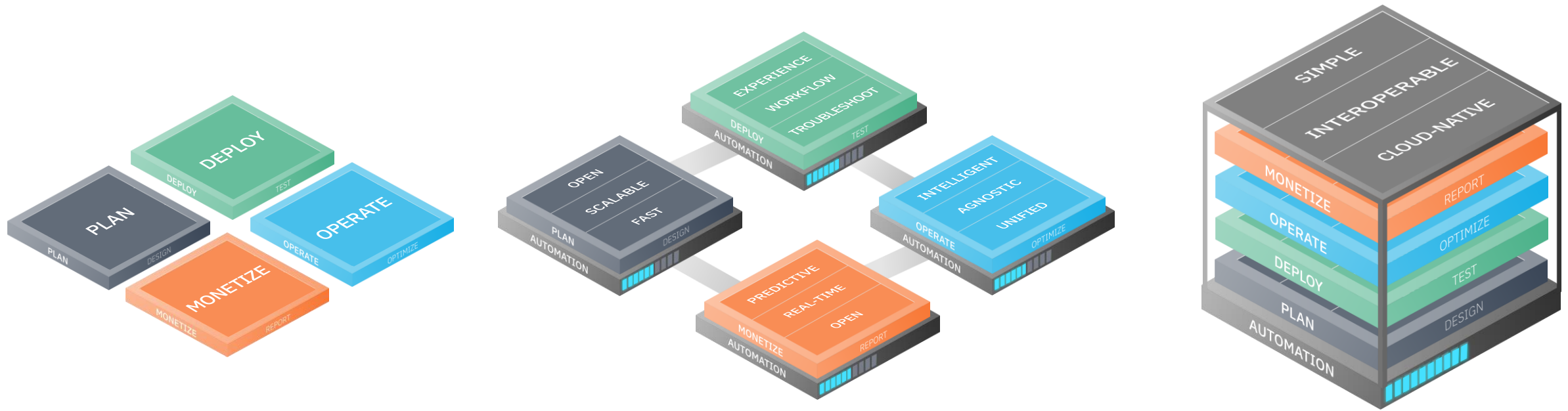
Market-leading products & solutions across the network lifecycle

Brought together by our NLA Cloud Platform



What we do: Network Lifecycle Automation (NLA)

Eliminate silos and unlock full network potential



1

How to improve efficiency of E2E Network Lifecycle?

2

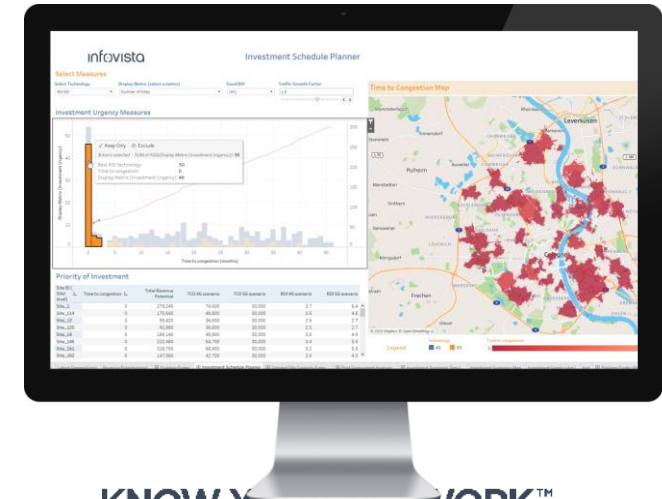
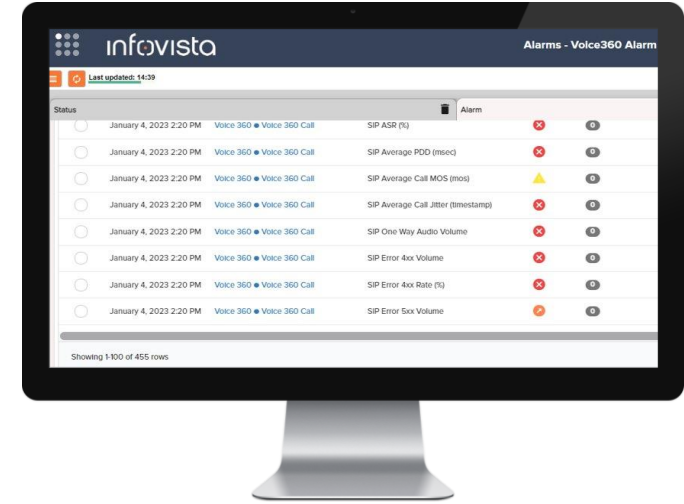
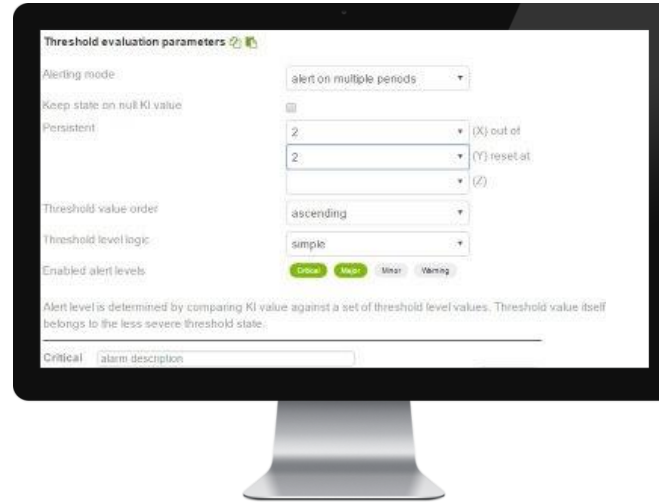
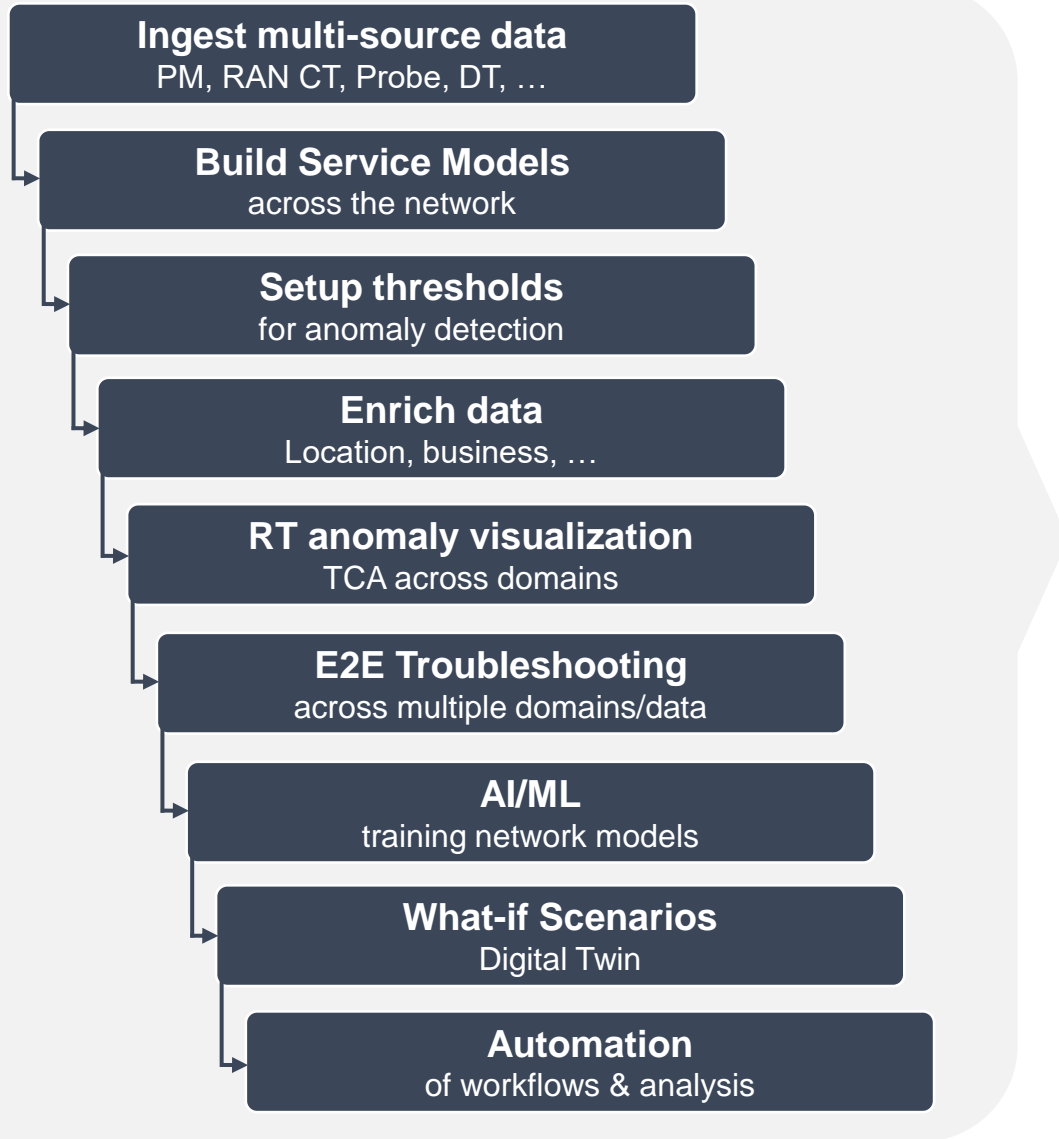
We bring automation and cross-domain interfaces to boost productivity and OPEX efficiency

3

Ultimate goal is an integrated, automated, cloud-native platform for huge gains across the board

Infovista's NLA Cloud Platform

End-to-end Automation Lifecycle

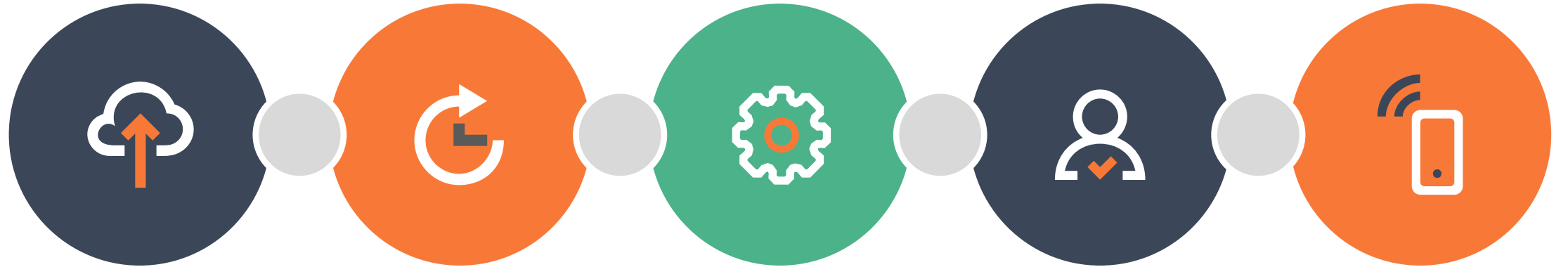


KNOW YOUR NETWORK™

Some use cases



TEMS™ for Drive Test Automation



Cloudification

Centralize orchestration and reporting

TEMS Cloud

Efficiency

Verify 5G sites faster

TEMS SSV App

Automation

Automate drive testing with AI/ML

TEMS Precision Drive Testing

OTT

Understand app & service experience

TEMS User Experience Testing

Unattended

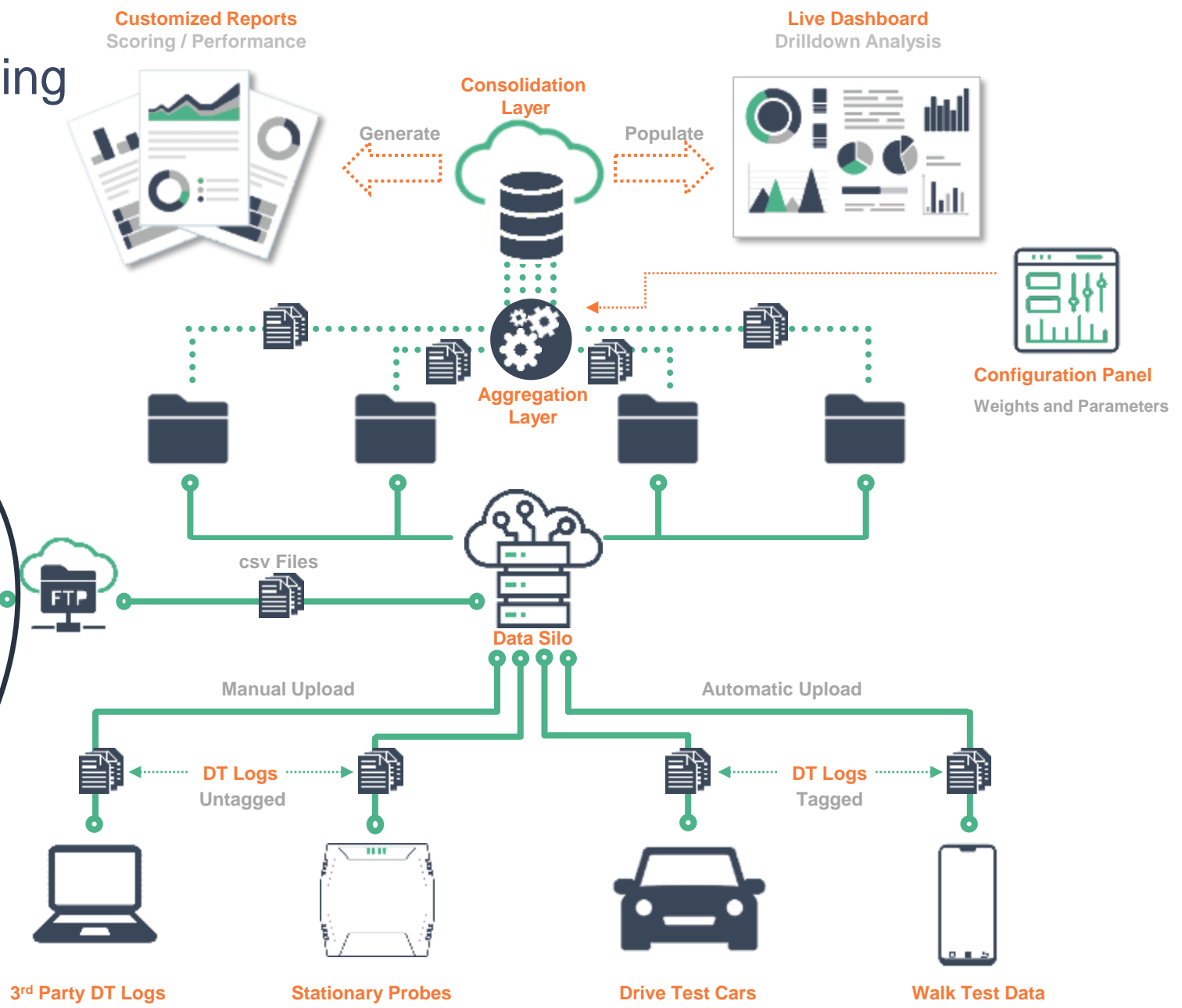
Leverage remote testing

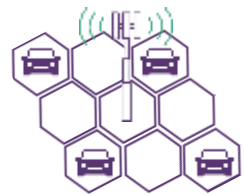
TEMS Sense

Precision Drive Testing Framework (TEMS Cloud)

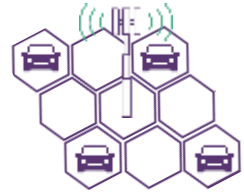


- OSS Data
- Planning data (Planet)
- Ativa Experience (RAN call traces)
- Klerity CX Assurance (DIP, user and signaling plan)
- Benchmarking (TEMS Paragon)

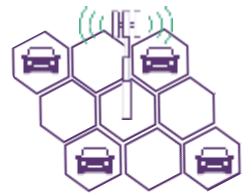




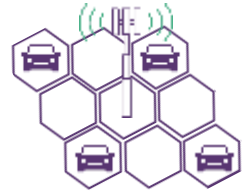
Team#1: OP1 – Region A



Team#2 OP2 – Region A



Team#3: OP1 – Region B

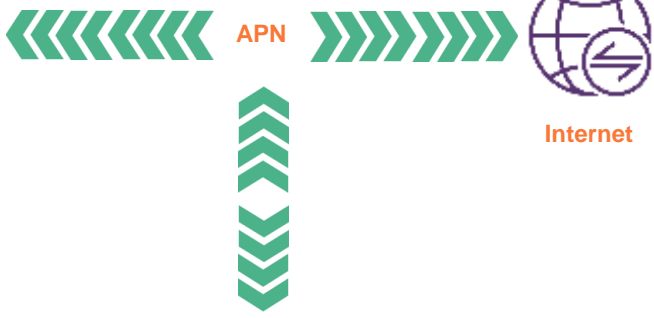


Team#21: OP2 – Region G



Driver View

- Drive Progress
- Map View



Internet



TEMS Backend

DoD, Triggers



Configuration

Maps, Statistical



Live Monitor

SSV, Cluster



Reports



High Level View



Operations Manager



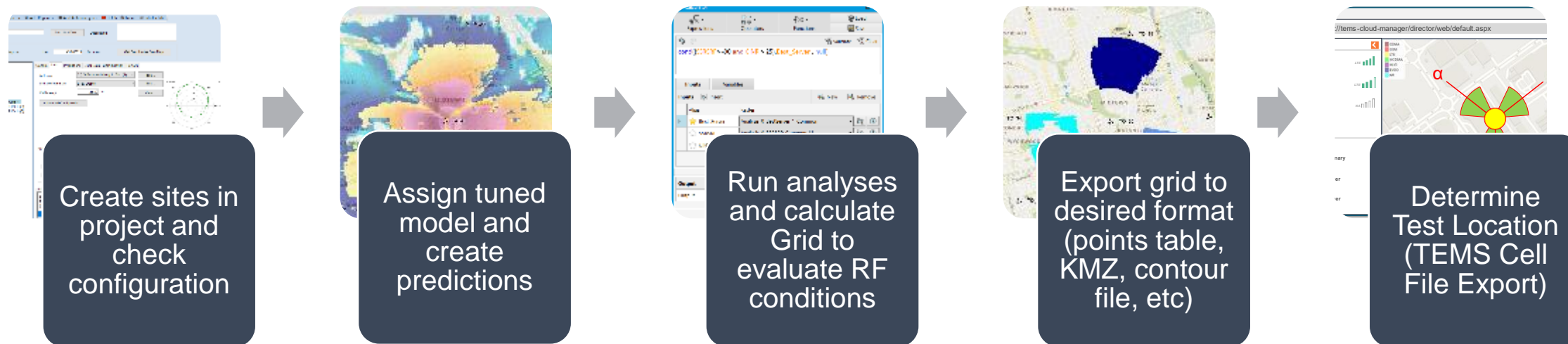
Quality Engineer



••• Coverage Map from Planning tool

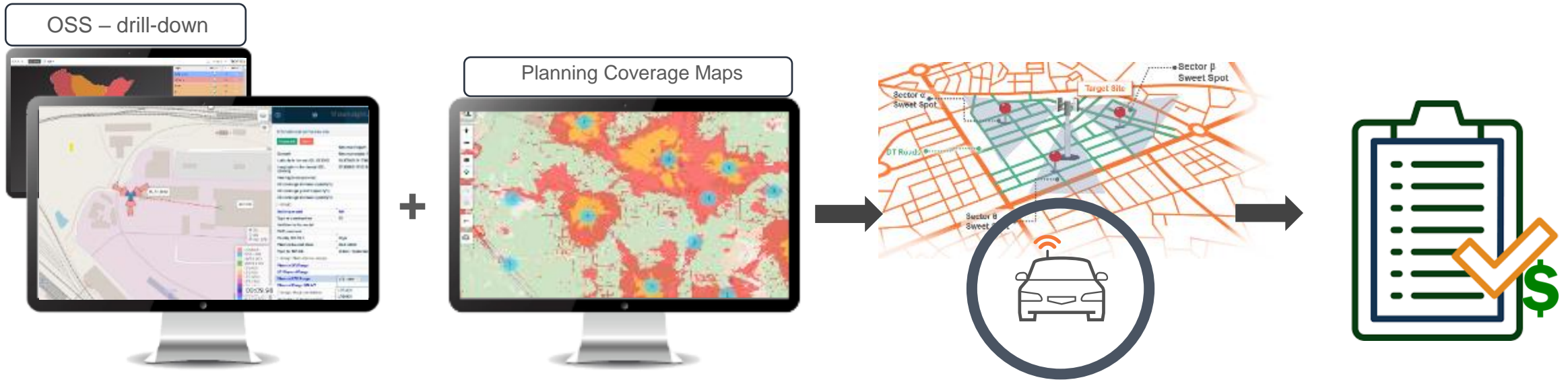
- Integrated Workflows to Configure Testing
- Automated SSV Testing in TEMS
- Leveraging Measurements easily in Planet

Using Planning Data For Drive Testing



1. Generate Optimal Locations for Testing (Sweet Spot) with Planet Query automation
E.g. RSRP > 80 and RS SINR > 18 and PDSCH Mod = 64 QAM
2. Auto populate Testing with Network and Site Configurations via TEMS Cellfile export from Planet

OSS + Coverage maps leading to Precision DT



System Readings combined with Drive Tests Workflow

A holistic approach



Monitor/Benchmark MNOs performance, **Country wide**, indoor/outdoor, **24/7** in **~real-time**
Out-of-the-box KPIs in Dashboards and reports (customizable)
Receive Automated **Alarms** notifying you of **SLA breaches**

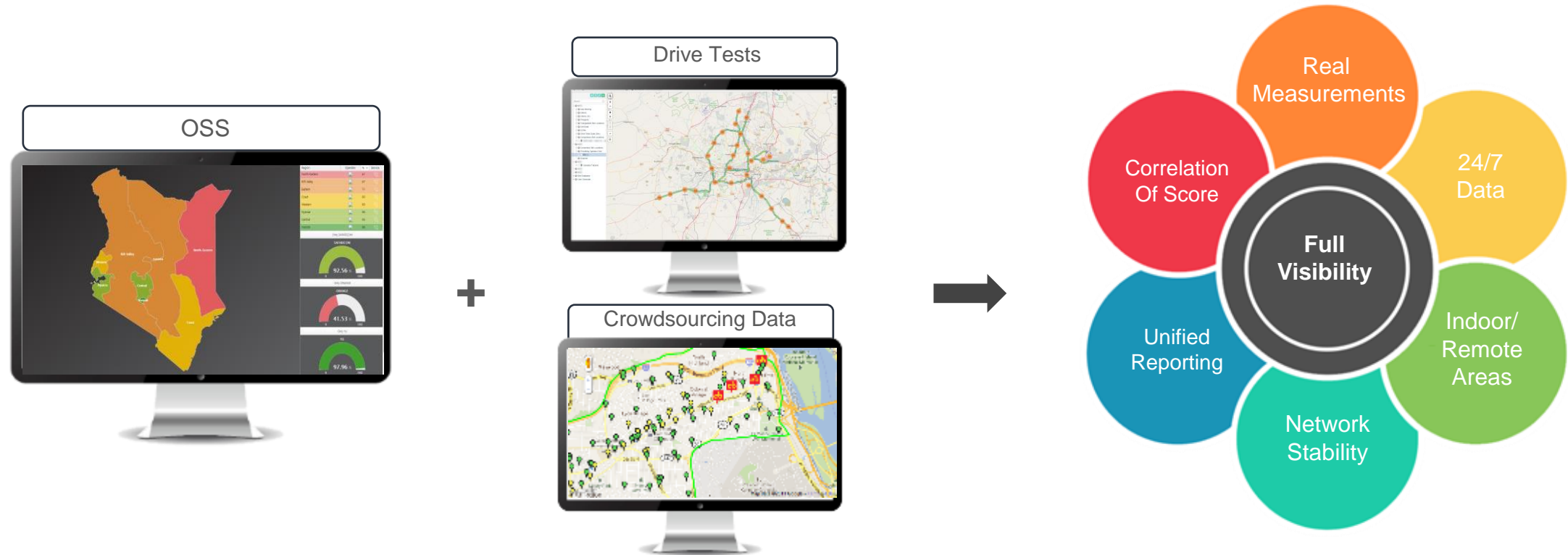
Drill-down from degraded regions, KPIs and alarms to problematic **areas/cells** and identify issues

Dispatch dedicated and precise Drive Test team **only to targeted** areas and relevant tests.

Reduce DTs and costs
Get informed better, faster
Automate workflows for efficiency
Monetize on SLA breaches

Unified Reporting through OSS: visualize DTs & Crowdsourced data

A holistic approach



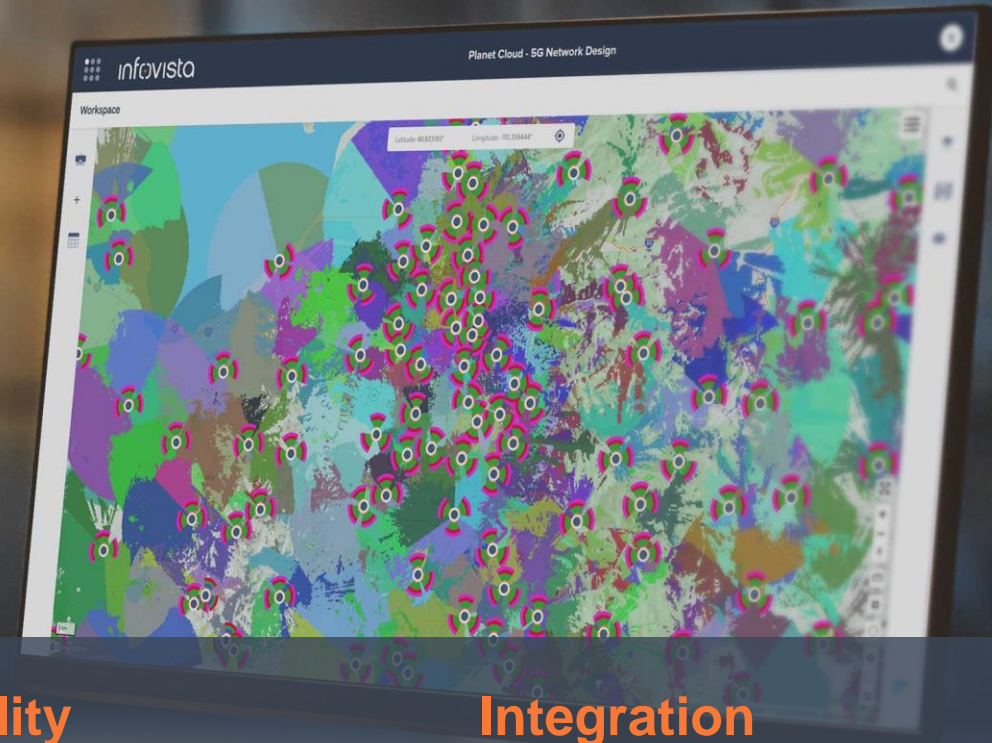
Monitor/Benchmark MNOs, **Country wide**, indoor/outdoor, **24/7** in **~real-time**
 Automated **reporting** (KPIs)
 Receive Automated **Alarms**

Visualize in the system:
 - DTs test and scoring
 - Crowdsourcing Data
 + Correlation for a unified scoring

- Get informed better, faster, everywhere, anytime, in 1 system
- Share data with MNOs for transparent and fast issue resolution
- Provide subscribers with comprehensive scoring per MNO
- Optimize # of DTs and Opex / Monetize

Planet Cloud

Improve radio network design efficiency and roll out next generation networks faster



Efficiency

Automated use case-centric workflows and intuitive user interfaces improve the speed and accuracy of network planning

Scalability

Cloud-native architecture enables nationwide planning, optimization and analyses

Integration

Open APIs to a full set of planning and optimization microservices deliver value beyond Planet

Why Planet Cloud?

Performance and efficiency gains lead to cost savings and improved time to market



Automation use cases

- + Reduction of manual activities
- + Automated reporting
- + Workflow innovation



Nationwide planning & optimization

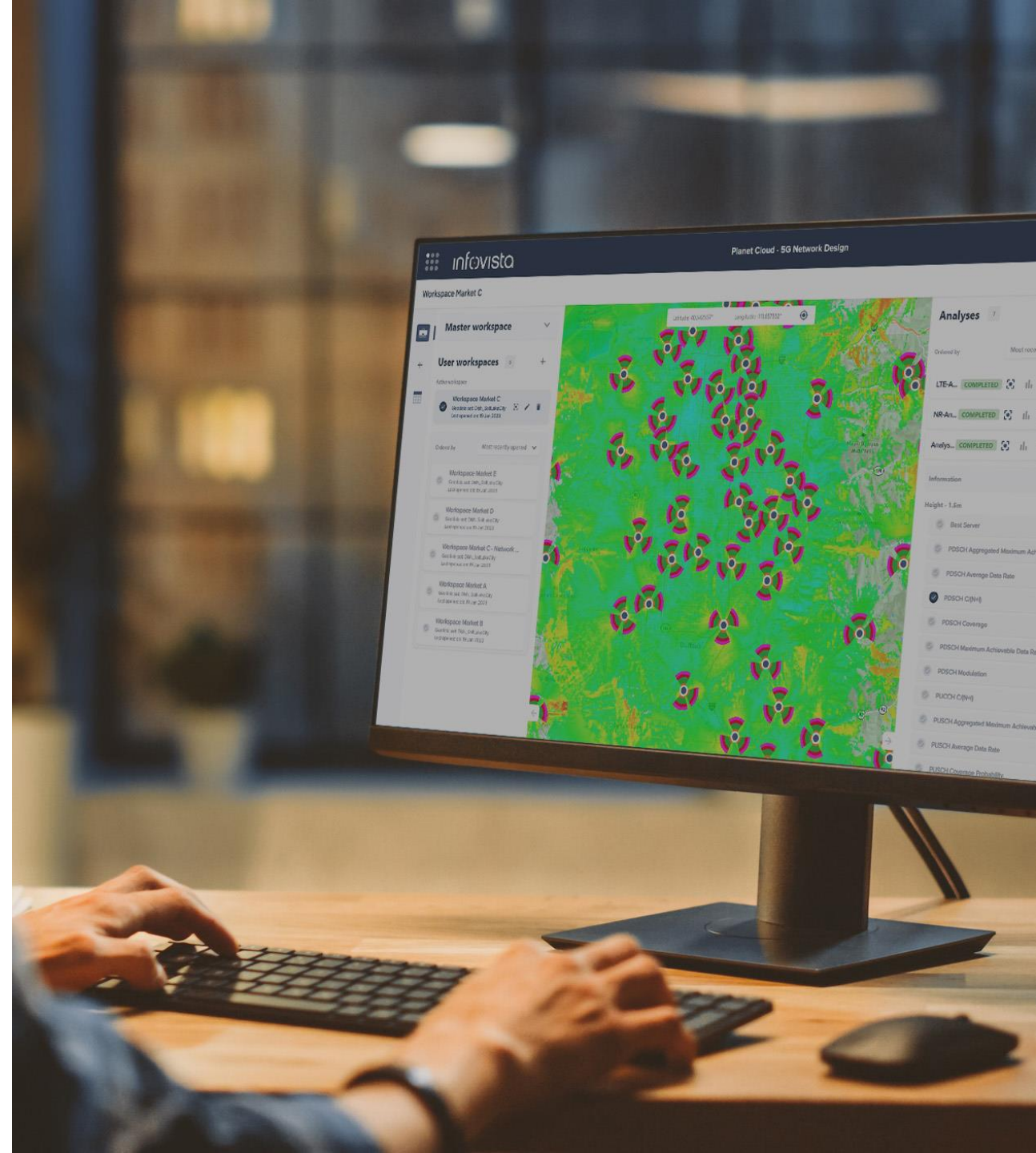
- + Coverage maps
- + Network statistics & dashboarding



Hybrid deployment model

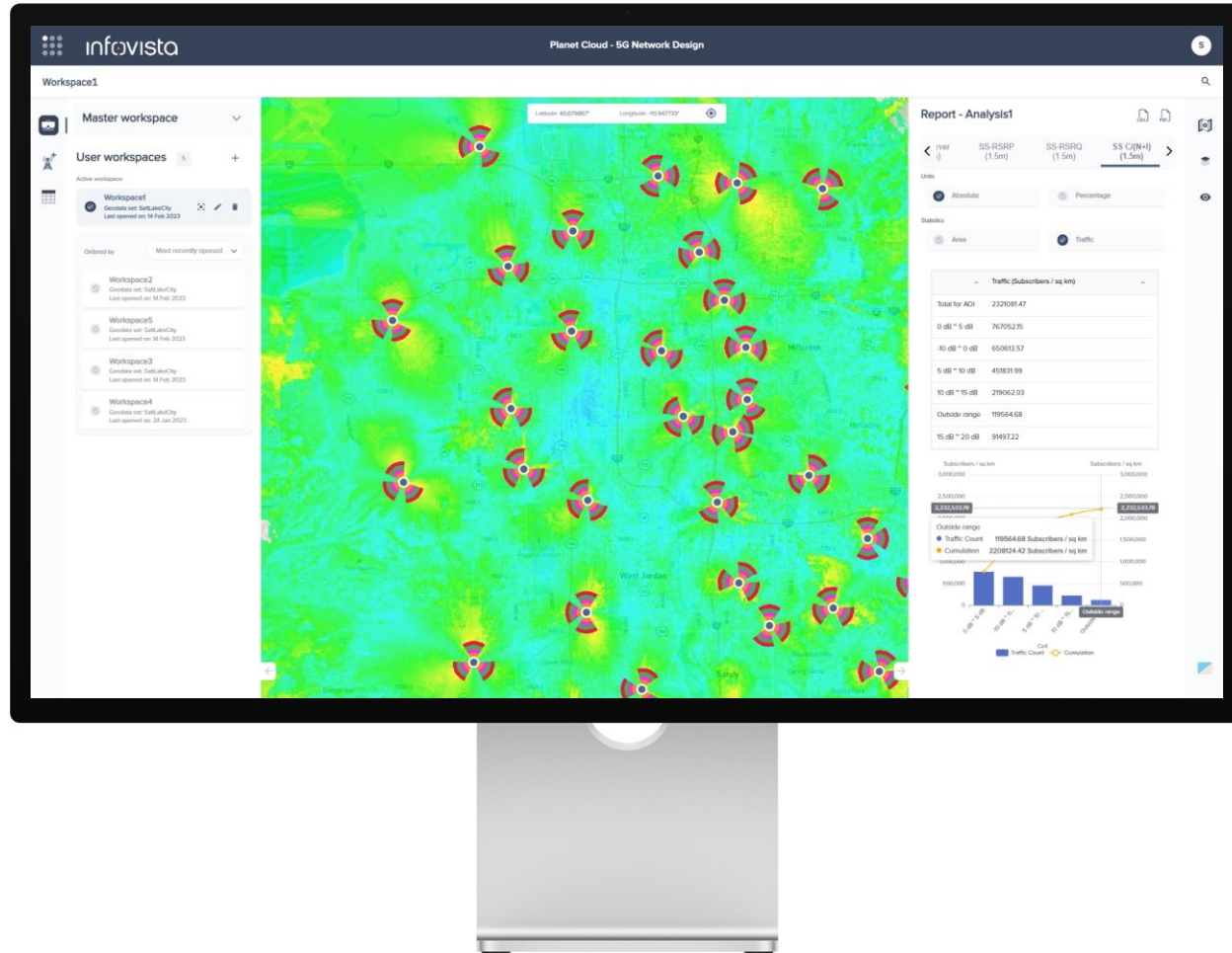
- + The right interface for each user
- + Centralized data management
- + Flexibility and elastic scalability
- + Ease of maintenance and upgrades

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Planet Cloud key benefit – User interface

Intuitive and efficient RF planning user interface



Simple

Clean, intuitive and modern design



Automated

Streamlined workflows dedicated to network design



Insights-driven

Maps and dashboards

Planet AIM

World's first commercially available AI-based propagation model

Machine learning

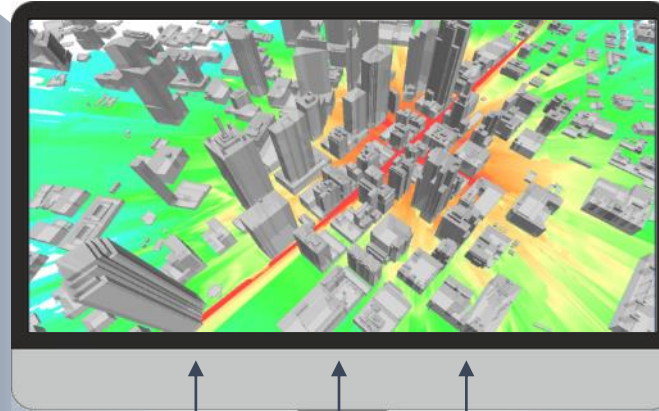
Constantly adapts to all available inputs delivering improved accuracy

Automatic calibration

Pre-calibrated using massive data sets
Enhance ML engine calibration further via drive / walk test data

Ray-launching

Intelligent ray launching activates only when required for improved dense urban accuracy



Modern geodata support

Elevation, clutter, clutter heights grids and building/vegetation polygons
Vegetation through-loss calibrated and modeled

All environments

Supports all environments: urban (macro / micro / pico), suburban, exurban and rural

Cloud-enabled

Massive horizontal scalability in a microservices environment

150MHz-80GHz

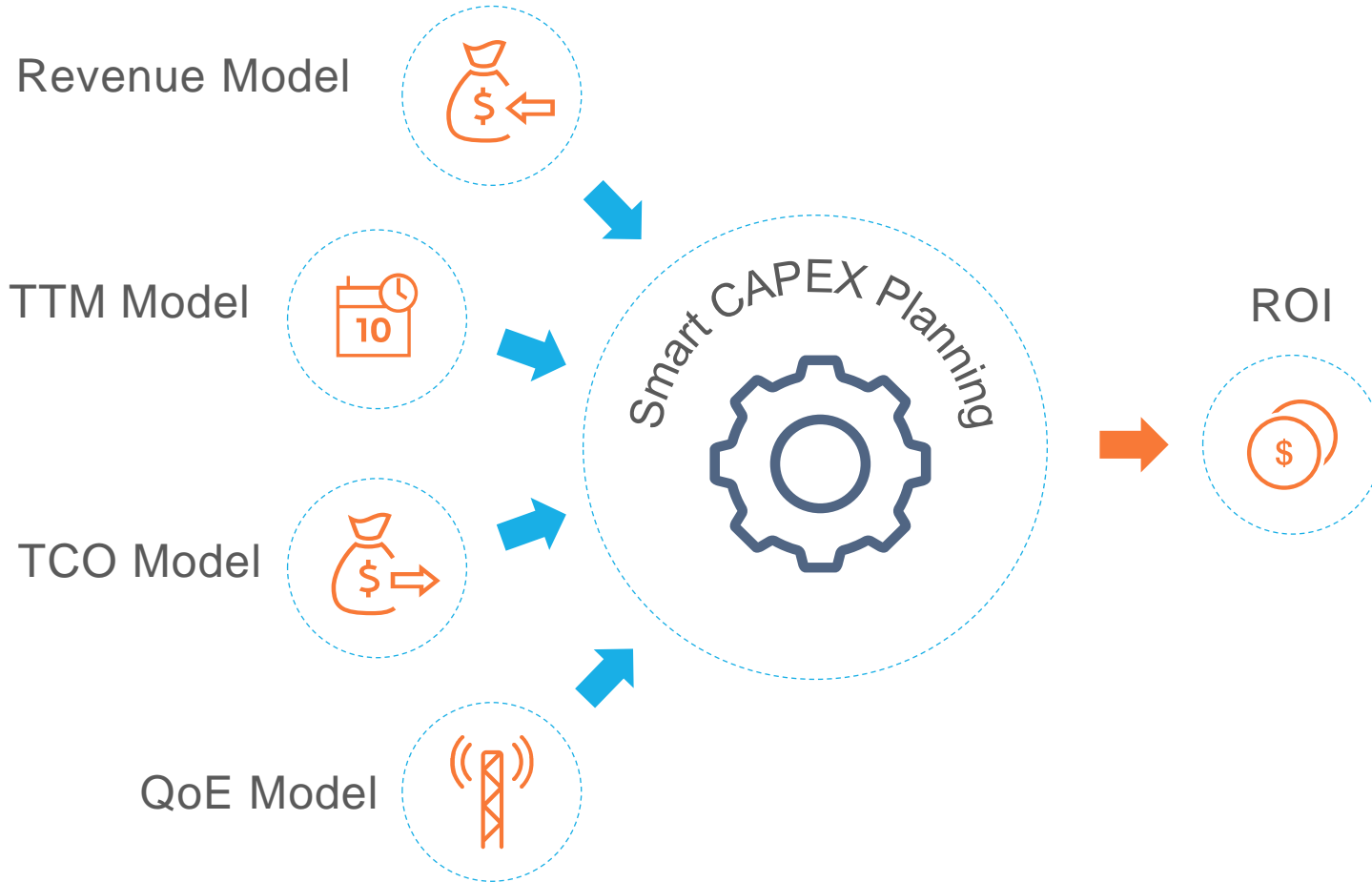
All Environments

3D

Up to **20% CAPEX savings** due to improved accuracy

Smart CAPEX

ROI driven greenfield and expansion ACP use cases



RF complexity abstracted to focus on business impact

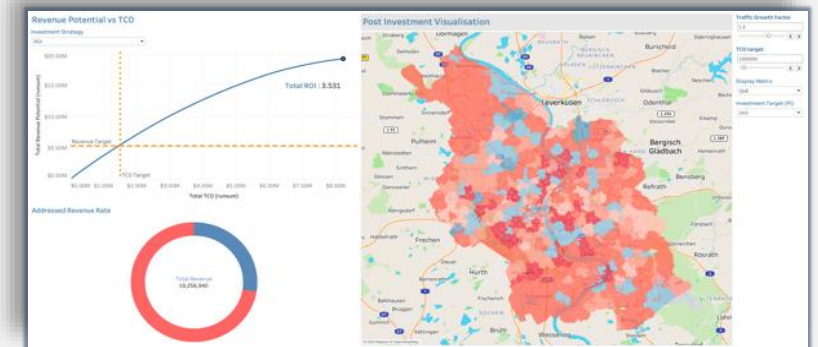
The depth of Planet RF modeling remains behind the scenes

Emphasis on decision making

A business-oriented web front-end to facilitate adoption by business executives

From problem detection, through business impact analysis, to network evolution plan

Supporting the size and extent of any network



RAN CAPEX prioritization & ROI optimization

Customer challenges

- Unclear business case for RAN investments despite lots of data being available

Our solution

- Detects current capacity constraints
- Forecasts future bottlenecks for different traffic growth scenarios
- Prioritizes RAN investments by area
- Selects the optimal design by evaluating the ROI of potential network designs

Proven benefits

- Up to 10% CAPEX reduction with no impact on network quality
- Better ROI by focusing investment where (areas with measurable benefits) and when (according to capacity forecasts) needed
- Visibility over the CAPEX investments across the organization



Crowdsourced data

Key insights into traffic demand improve the accuracy and efficiency of network planning



Highly representative

Subscriber-centric data, from all frequency bands, all operators, all devices and all geographies



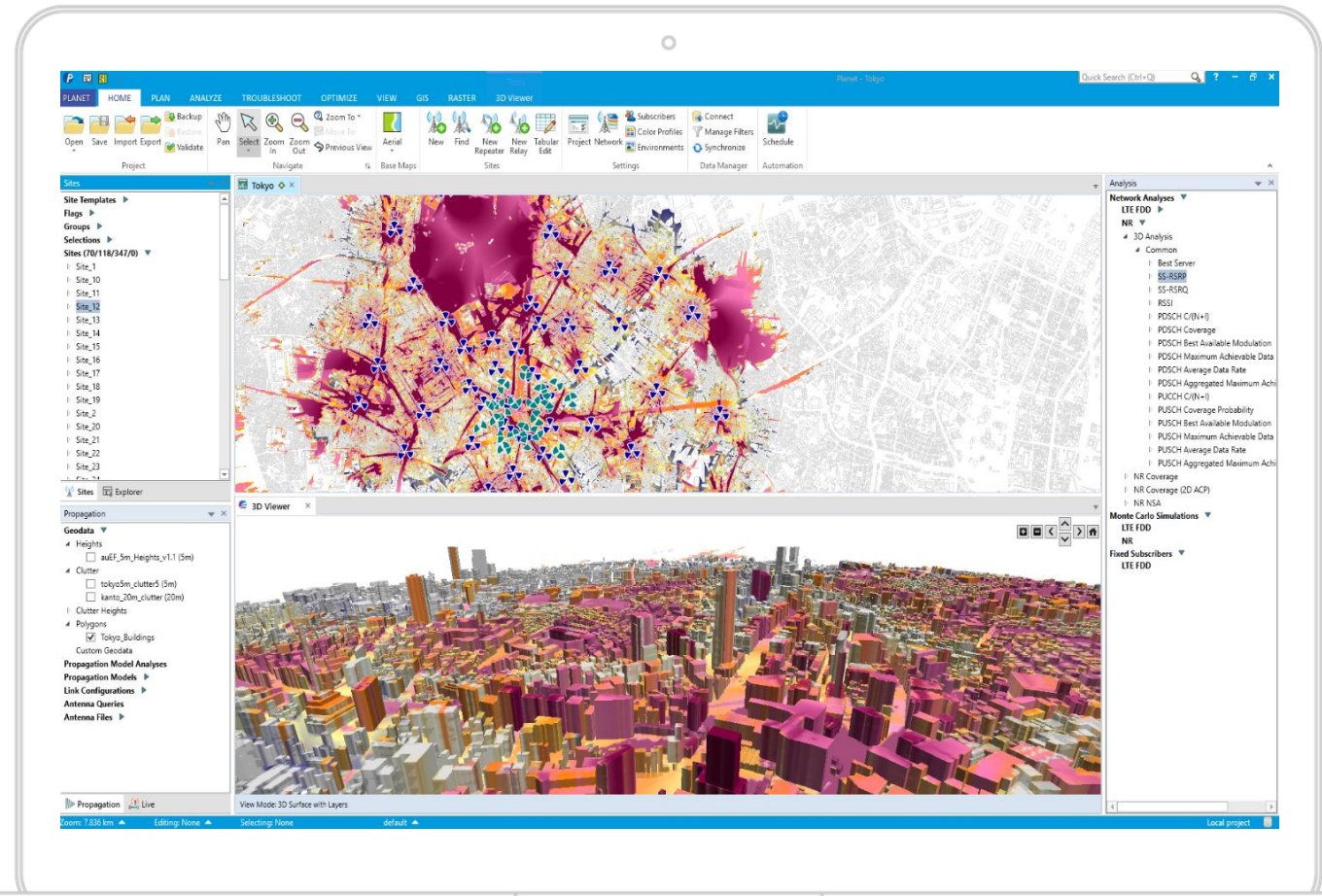
ROI-driven planning

Focus network investments on the areas of high traffic demand and high revenue potential



Efficient workflows

Enables automated planning workflows for improved efficiency and complexity management



Crowdsourced data

Direct access in Planet to 9 billion data points collected every day

Fully integrated

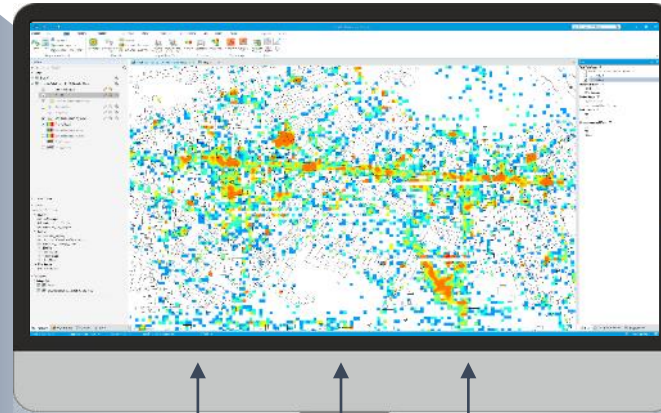
Data retrieved directly from the Umlaut database, no manual import or data processing required

Flexible

Event filtering (date, time, RAT, and, cell, operator) to support any use case

Scalable

No data volume limitation thanks to pre-aggregated data



Integrated

Automated

Scalable

Traffic maps

Highly accurate geospatial traffic and user experience heatmaps on which to base planning

Validation

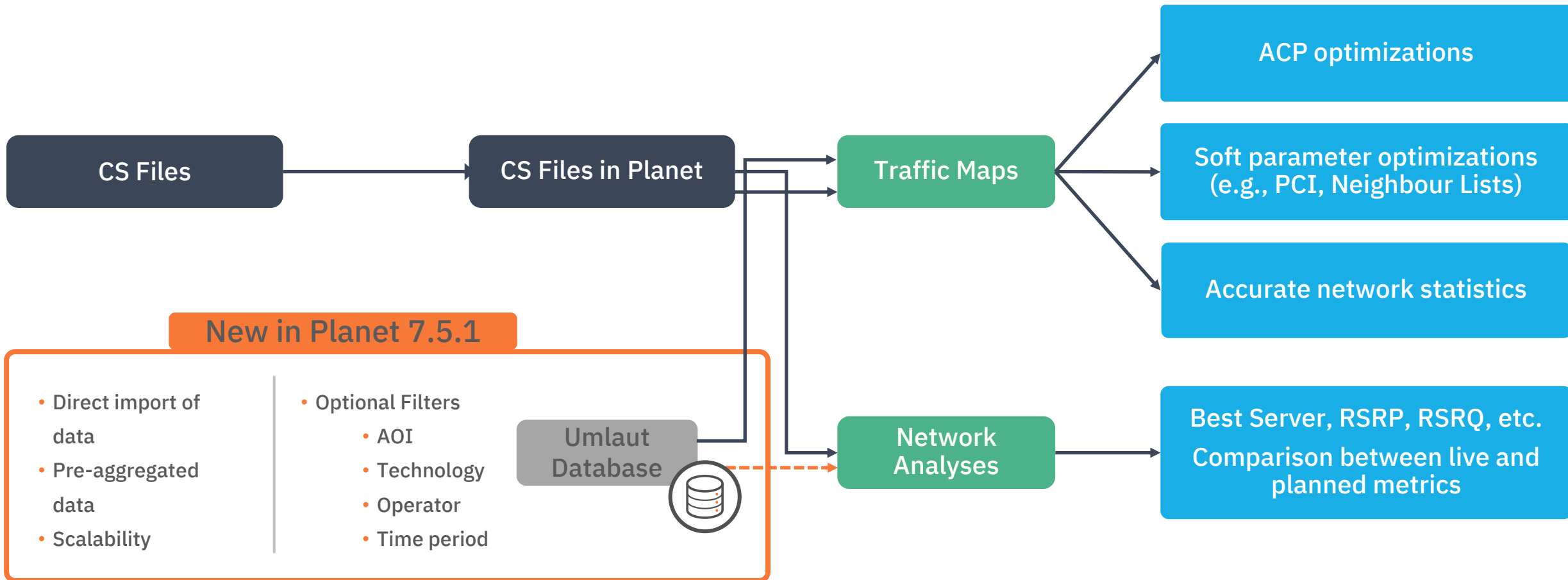
Cost-effective validation of coverage and quality of experience

Competitor benchmarking

Unique insights to real competitor performance

Umlaut is the **recognized leader** in the collection and processing of crowdsourcing data

Leveraging Crowdsourced Data in Planet



- New in Planet 7.5.1**
- Direct import of data
 - Pre-aggregated data
 - Scalability

- Optional Filters
 - AOI
 - Technology
 - Operator
 - Time period



————> Existing feature
- - - - -> Roadmap feature

Conclusions



Infovista for automated user centric data correlation

- Over 25 years of experience in **Drive Testing, Planning, Network and Service Assurance**
- Decades of **Telecom expertise** and cooperation with **ITU-T**, providing standardized trustful data (e.g. ETSI scoring,...)
- Over **80%** of world's Tier1 CSPs using our Service Assurance solutions (China Mobile, AT&T,...)
- Infovista's assures continuous **innovation** and investment in its R&D, products and solutions
- **Unique capabilities:**
 - TEMS Cloud for **Precision Drive Testing**
 - **Distinctive Reporting** capabilities with Bird's-eye map views, with drill down on region/vendor/technology
 - Pre-built **NQIs** (Network Quality Indicator) and flexible **customization** of ad-hoc KPIs/formula.
 - **Multi-tenancy** allows Service Providers to access their own data within the tool
 - Native **integration of DT** measurements, through parsing capabilities of **TEMS** or 3rd party tools
 - Native **integration with Planning** tool, running automatic predictions of new site placement and correlating with network performance and Drive Tests
 - **Integration with CS data**, adding a new layer of visibility from actual samples

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Thank You

