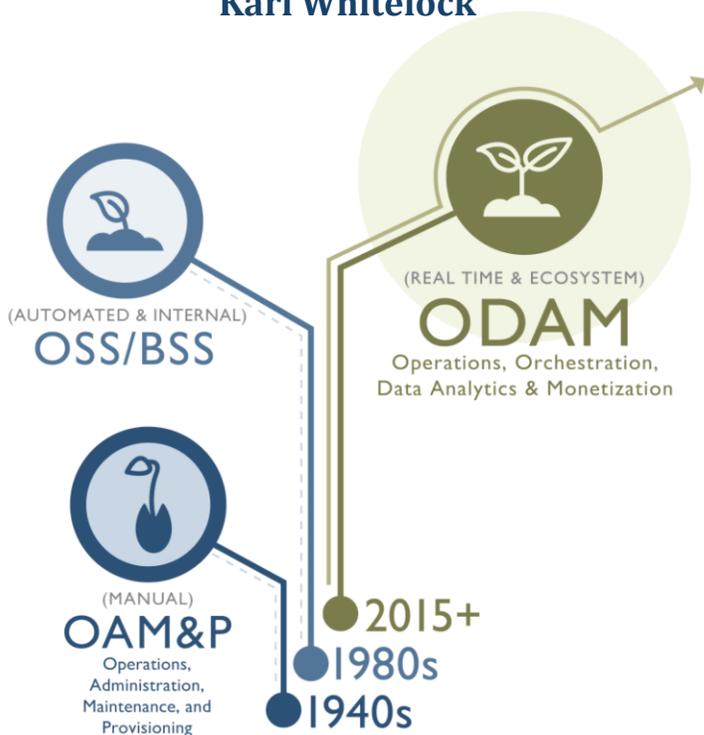


An Excerpt From: **Global ODAM 10 to Watch in 2018** *(Veriflow – Managing Networks with Intent)*

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**Operations, Orchestration, Data
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Introduction¹

Throughout 2017, the hype never wavered concerning communication services providers (CSPs) need to update and transform their systems and processes. In 2018, it is becoming clearer that digital transformation is a strong part of the modernization strategies of all industries, and not just the communications business.

For suppliers of Operations, Orchestration, Data Analytics & Monetization (ODAM)² solutions, the transformational evolution of technology, business strategy, and customer expectations is driving innovation and growth. This triumvirate continues to be the realm of business ingenuity, systems design and development resourcefulness. It has been a realm typically defined by entrepreneurial startups, but now increasingly by the innovative forces within larger suppliers that know that survival for them is dependent on addressing today's business needs, and in preparing now for tomorrow's expectations.

ODAM solutions will need to perform in a double-duty fashion for many years to come. First, working seamlessly with existing systems and multiple data repositories aligned with previously implemented business management and network operations processes. Second, delivering capabilities essential to operate and manage new business models, new technologies, new services, and new types of customers. The emergence of both of these realities started en masse during 2017, but will accelerate in 2018 as key operations and monetization functions evolve to support each of these business drivers.

The 10 ODAM companies that Stratecast has chosen as its ***10 to Watch*** in 2018 are focused on meeting critical business challenges and improving technology enablement functions. These companies are included in our list because they deliver innovative solutions that help CSPs transform operations, address new business needs, and help to improve the customer experience.

Veriflow: Managing Networks with Intent

The networking industry generates its fair share of buzzwords, many of which are nebulous at best, bordering on vacuous. To wit: agility, big data, IMS, disruption, real time, DSL, paradigm shift—the list goes on. But once in a while, a new term comes along that piques our interest in a way that sucks us in and reminds us why we still believe there is room for innovation. Why? Why do we keep falling for buzzwords? Because every so often, one turns out to describe exactly what the industry needs, and is presented by a new company in a way that makes us think, “Hey, this could work. This might stick.” Intent-based



¹ Please note that the insights and opinions expressed in this assessment are those of Stratecast, and have been developed through the Stratecast research and analysis process. These expressed insights and opinions do not necessarily reflect the views of the company executives interviewed.

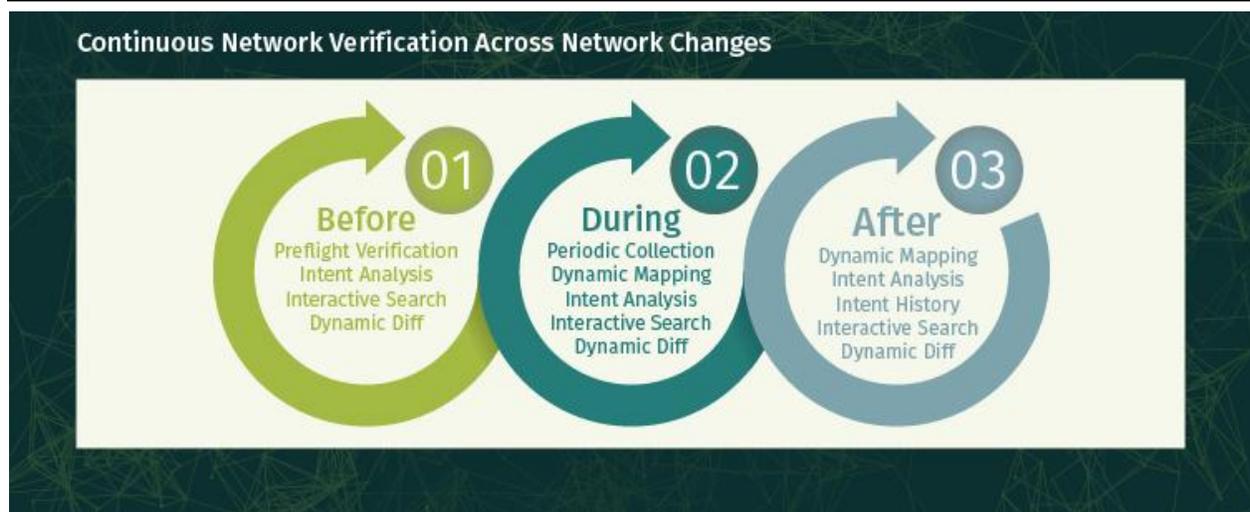
² For more insight concerning ODAM, see the last page of this report.

Networking (IBN) is such a buzzword. San Jose, Calif.-based Veriflow³ is such a company. Veriflow is not alone in its quest for IBN, but its approach provides good reason for the company to be one worth watching in 2018.

Veriflow emerged two years ago from stealth mode with a math-based solution funded by New Enterprise Associates (NEA), the National Science Foundation, and the Department of Defense. The company has an enterprise focus; but Stratecast believes that the influence of Veriflow's work in IBN, and that of others such as Cisco, will be felt across all domains of networking, including telecom.

Veriflow addresses a phenomenon long understood by nightshift NOC technicians: networks seldom break without someone sticking their fingers into them or misconfiguring them from the start. IBN works to eliminate outages and vulnerabilities in networks by predicting the future through mathematical modeling. The technology relies on the proven concept of formal verification, a methodology with principles that have been applied in other science and technology sectors such as space exploration, silicon design and aeronautics. Veriflow has brought the technology to networking and renamed it "continuous network verification." The activities across three steps of the verification process can be seen in Figure 1.

Figure 1: Veriflow's Continuous Network Verification Process



Source: Veriflow

Unlike previous and current network management and service assurance solutions, Veriflow does not rely on traditional traffic data analysis to formulate its view of the network and its performance. Six months after coming out of stealth mode, Veriflow launched its Network Verification Platform

³ Two professors from the University of Illinois, armed with PhDs in Computer Science from Berkeley and a grant from the National Science Foundation, teamed up with a fellow UoI PhD to form Veriflow in 2013, after publishing original research in 2011 on applying formal verification methodology to assure network-wide intent in operational networks. Veriflow founders used this as the foundation for its patented Continuous Network Verification technology; which, thanks in part to \$3 million in funding from the U.S. Department of Defense, the company brought to market in April 2016.

and simultaneously named two early enterprise customers in Barclays and Pandora. Since the announcement of these companies, Veriflow has also named Tier 1 service providers as customers.

The new platform answers the question of how to get visibility into network performance without using traffic data as a primary source. Veriflow instead uses patented continuous network verification algorithms to predict all possible network-wide behavior, and to mathematically verify whether this network model meets desired security and resilience policies. Veriflow continually assures that end-to-end service and security policies are correctly implemented for all possible traffic.

The platform is comprised of four main solutions:

- **Network Segmentation and Vulnerability Detection** – Detects all network segmentation and security policy vulnerabilities before they are exploited
- **Network Availability and Resilience** – Reduces manual effort and eliminates change-induced outages by comprehensively verifying application availability
- **Continuous Compliance** – Automates continuous compliance through network-wide policy verification and automated mapping
- **Rapid Incident Response** – Uses interactive search and visualization to pinpoint problems and reduce time to resolution

More recently, Veriflow introduced a verification solution for hybrid networks, and updated the Continuous Network Verification platform that introduced IBN and four new capabilities:

- **CloudPredict** – CloudPredict enables organizations to verify hybrid networks spanning public clouds and on-premises infrastructure. Available for Amazon Web Services (AWS), CloudPredict lets networking and security operations teams gain end-to-end network-state awareness into hybrid networks, enabling them to securely manage mission-critical workloads and protect sensitive data across cloud and network domains.
- **Automated Intent Inference** – Automated Intent Inference ensures that the network matches the business intent, and intelligently infers business goals with zero input from the user. The solution does this by automating thousands of network-wide checks that assure network availability, resilience and protection. It also pinpoints network misconfigurations that can result in outages and security vulnerabilities.
- **Preflight** – Preflight allows users to run “what-if” scenarios during the planning process, before making a network change. Analysis then predicts how changes to a device may affect network behavior.
- **Dynamic Diff** – Dynamic Diff compares snapshots of the network, and identifies changes for planning, analysis and compliance purposes.

IBN incorporates other emerging trends—or necessities—in networking. Because of the scale and complexity of next-generation networks, management, orchestration, assurance, and security all require a higher level of these necessities: automation, closed-loop operations, and intelligence. In addition, IBN will address another long-standing challenge to network operators: ensuring that the investment in networking technology and its operational performance are in line with business objectives. **For these reasons and more, Veriflow will be an interesting company to watch in 2018.**

Stratecast The Last Word

Digital transformation is affecting more than the communications marketplace. Companies in all industries are now positioning to do business in a new dimension. Yes, customers can still do what they have always done, but as everything in our world continues to become connected, new business models, new services, and new types of customers are now the norm. We are seeing this phenomenon everywhere, though the saving grace for many companies is that there are still more devices not connected than those that are connected, and there are still more traditional ways of selling to customers than there are new ways to do business. However, change is here and the need for business evolution is now approaching at a pace as fast as an avalanche thundering down a steep mountain slope.

As connectedness grows and digital lifestyles at both the consumer and business levels evolve, 2018 will be the year when intense innovation and evolution will become essential for business survival of any organization in any industry, but especially in the communications industry. Companies taking on a global market enabled by the internet, are finding that none are immune to the effects of digital transformation, whether a CSP in one region of the world, an application developer in another, or an internet-based organization in yet another.

Stratecast annually produces our *10 to Watch* report to highlight organizations that are making a difference in their respective disciplines when it comes to upgraded capabilities for meeting the demands of business and technological change. The companies we highlight in this report include:

- Cardinality: Making Data Intelligent
- Cisco: Leading with Intent
- ForgeRock: Driving Unity in Identity and Access Management
- Hewlett Packard Enterprise: Leading the Fraud Management Market
- MYCOM OSI: Building a Future in Cloud
- Netscout: Looking at Clouds from Both Sides Now
- Sandvine: A “New” Company Providing Active Network Intelligence
- Sigma Systems: Seizing on Momentum
- Veriflow: Managing Networks with Intent
- WeDo Technologies: The Leading Revenue Assurance Supplier, Now in the Cloud

This year’s challenge will be tied to how fast new capabilities can come online before the needs of business exceed an organization’s ability to actually deliver. Or, are we already at that point?

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About ODAM

The processes and tools that communications service providers (CSPs) have utilized to run their businesses have changed over time. More than a half-century ago, CSP network and business management processes were manual (OAM&P). As CSPs evolved over the years, so did the operations support systems (OSS) and business support systems (BSS) that address CSP business and network management needs. In recent years, the lines between OSS and BSS have become less clear, with much overlap. In addition, the roles in which OSS and BSS operate have expanded beyond traditional boundaries. As such, Stratecast now uses the term Operations, Orchestration, Data Analytics & Monetization (ODAM) to encompass both the traditional OSS and BSS functions and the new areas in which business and operations management must now work together, including virtualized networks and telecom data analysis.

About Stratecast

Stratecast collaborates with our clients to reach smart business decisions in the rapidly evolving and hyper-competitive Information and Communications Technology markets. Leveraging a mix of action-oriented subscription research and customized consulting engagements, Stratecast delivers knowledge and perspective that is only attainable through years of real-world experience in an industry where customers are collaborators; today's partners are tomorrow's competitors; and agility and innovation are essential elements for success. Contact your Stratecast Account Executive to engage our experience to assist you in attaining your growth objectives.

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