

ABI RESEARCH COMPETITIVE RANKING

CLOUD-NATIVE AUTOMATION AND ORCHESTRATION SOFTWARE MARKET

a - **amdocs**

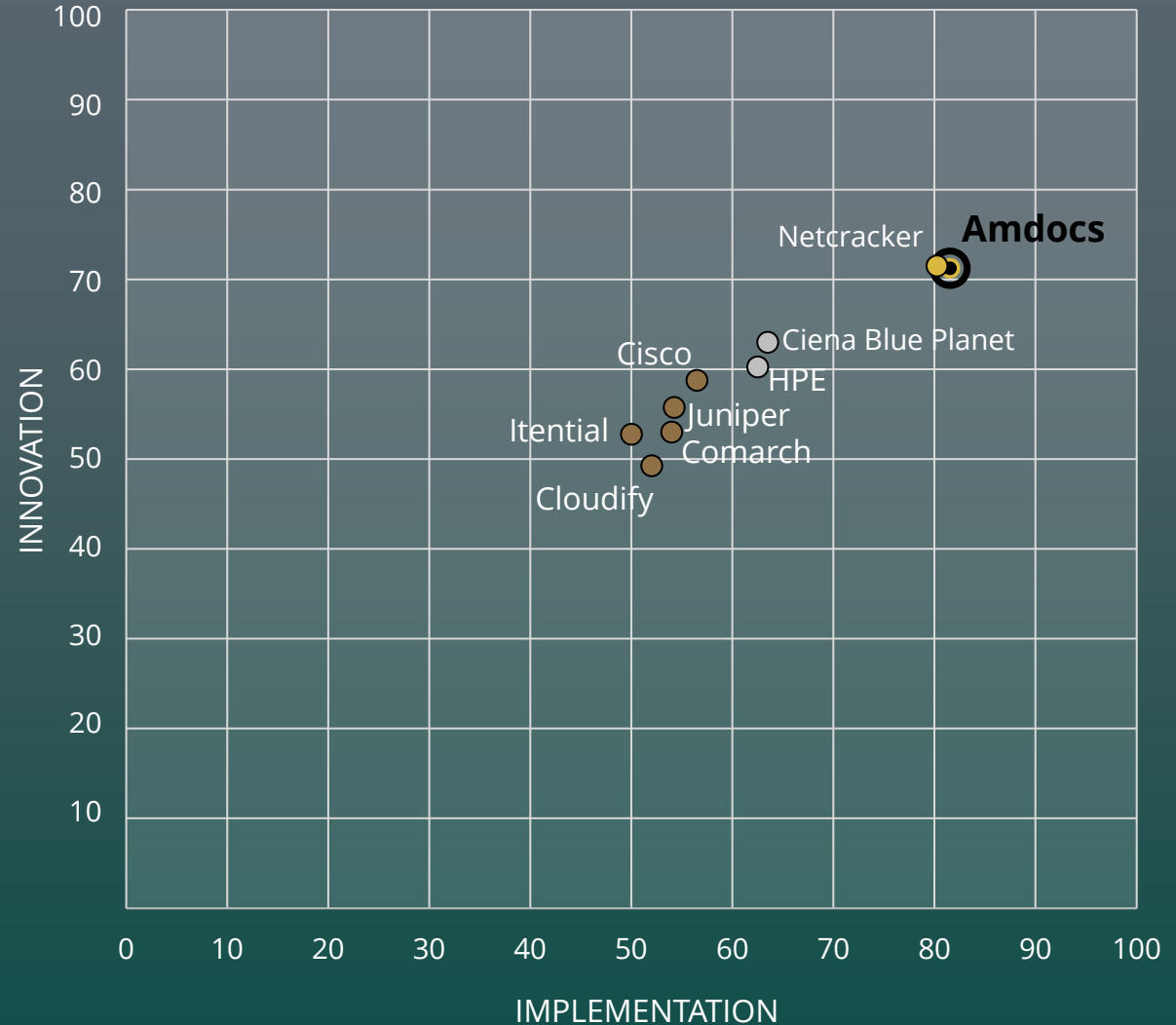


OVERALL: 76.5 | INNOVATION: 71.3 | IMPLEMENTATION: 81.5 | RANK: 1



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AMDOCS
INNOVATION
VERSUS
IMPLEMENTATION
MATRIX



INNOVATION



**INNOVATION
SCORE: 71.3**

Amdocs occupies a significant position in the market with a wide range of cloud-native automation solutions and a strong services arm. Amdocs' automation portfolio comes from in-house development and acquisitions that fit neatly into an organic growth business strategy. For example, Amdocs' recent acquisition of TEOCO's service assurance business builds on its existing core assurance business. Further, with TEOCO's service assurance business, Amdocs acquires a set of customers in a quicker and more efficient fashion than it could have done following a go-it-alone strategy. Amdocs provides multiple products, including Network Inventory, Service Fulfilment & Activation, E2E Service & Network Orchestration, and Amdocs Helix Service Assurance Suite, all of which fall under Amdocs' Intelligent Networking Suite (INS) and Amdocs RAN analytics. Amdocs complements that automation offering with its Cloud Operations Platform and Amdocs AI & Data Platform. Amdocs' approximately 30,000 personnel give the company a strong foothold across all markets, rendering it a good foundation for continued growth.

Amdocs' Cloud Operations Platform stands on a rich repository of automation artefacts. For example, Amdocs highlights that there are 18,000+ artifacts (flows, templates, etc) organically developed that are available for its customers' rapid automation implementations. Amdocs notes that its INS modules support E2E automation for the entire service lifecycle across multiple domain and vendors. Amdocs' INS builds on Service-Based Interface (SBI) plugins like RESTCONF, NETCONF, ETSI, and TM Forum interfaces for vertical VNF, CNF, Environmental Management System (EMS), and OSS integration. Amdocs complements INS with its AI & Data Platform to support CSPs with automating operational processes, and reducing manual procedures and hardened processes typically found in telco networks. There is a wide range of cloud-native technologies that Amdocs leverages in its automation portfolio as follows:

INNOVATION



INNOVATION
SCORE: 71.3

- **Implement an Intent-Driven Architecture:** This approach to automation improves efficiency and agility. For instance, it enables optimal placement of workloads and NFs in line with business intent. CSPs can model the intent and it can be any combination of parameters, such as location, throughput, latency, and hosting cloud environment and associated features (cores, Graphics Processing Unit (GPU), vendor, etc).
- **Use AI/ML-Driven Analytics:** This helps CSPs exploit the service and resource data generated in their consumer and enterprise business lines. Amdocs' acquisition of TEOCO's service assurance business complements its AI/ML-driven analytics for massive data collection and processing at scale. Here, Amdocs follows a layered approach: the low layer data collectors; the mediation layer to convert "raw" events into resource- and service-level KPIs; the intelligence layer that translate events into actionable insight; and the service-level policy layer.
- **Build on Cloud-Native Design Imperatives:** Amdocs notes that 10,000+ employees are already trained with agile and DevOps tooling. For example, Amdocs uses AI-driven automated testing that offers a delivery pipeline to facilitate continuous deployment, continuous monitoring, and continuous customer feedback. This enables CSPs to deploy new value-based features and support fast cycles of build, test, deploy, and release.

IMPLEMENTATION



**IMPLEMENTATION
SCORE: 81.5**



Amdocs provides several implementation models that include delivery and system integration services, and consulting services to help CSPs obtain digital and automation skills and knowledge, and operations and managed services. In fact, Amdocs highlights that it serves 55+ CSPs with Amdocs Managed Services. Amdocs continues to offer service and integration capabilities tied to products bearing Amdocs' logos and product deployment for vertically integrated architectures. If an Amdocs product goes down, Amdocs fixes it. But industry structure in the coming years stands to be horizontally stratified. So, increasingly, Amdocs also integrates around non-Amdocs products coming from multiple vendors, taking over and acting on behalf of CSPs in all aspects of technology—from building applications, to defining architectures and managing some of the CSPs' workloads to deliver measurable business value. Amdocs follows the Scaled Agile Framework (SAFe) across its services organization and product business group. That provides CSPs with an improved time to market and increased agility in their service and network operations. Specifically, key dimensions of Amdocs' methodologies include:

- **Implement a Design-Led, Customer-Focused Approach:** Starting with customers' needs and pain points, Amdocs defines what must be delivered and then works out the best way to design and deliver it to supply value in small increments. Amdocs begin projects with its customers' most urgent needs in mind while leaving room for adjustments based on changing priorities.
- **Execute in Small Iterations:** Amdocs divides projects into an initial Minimum Viable Solution (MVS) followed by multiple Minimum Testable Value (MTV) releases. This allows Amdocs to iteratively add functionality, deliver continual business value, and release and deploy new value-based features to its customers in a rapid and regular manner.
- **Break the Silos:** Amdocs highlights that it breaks the silos between teams to allow them to work together efficiently and to deliver in small iterations. Amdocs looks to deliver business value as opposed to just applications or automation technology.

IMPLEMENTATION



**IMPLEMENTATION
SCORE: 81.5**



Amdocs is a highly entrenched vendor among multiple Tier One CSPs with AT&T chief among them. To date, automation implementations for Amdocs include customer ordering and fulfillment for customer and business services, E2E service, and network orchestration for Software-Defined Wide Area Network (SD-WAN) and 5G slicing, and virtual, cloud network functions, such as mobile core, virtual IP Multimedia System (vIMS), etc. Amdocs also automates coverage and capacity optimization for RAN, vRAN and Open RAN. Amdocs integrates with almost all public cloud and infrastructure vendors. In fact, Amdocs provides automation and orchestration functionality for AWS Telco Network Builder, AWS' offering to automate telco networks. Amdocs' automation software is designed to enable modular expansion as CSPs evolve through service-layer interfaces and APIs. CSPs increasingly are looking for automation solutions that can tie higher-level service abstractions to the business and service intent. To address that, Amdocs, is investing in making network and infrastructure automation more service and application aware, enabling multi-layer translation from business to service to resource intents.

CRITERIA AND METHODOLOGY



VENDOR MATRIX

Methodology: After individual scores are established for innovation and implementation, an overall company score is established using the Root Mean Square (RMS) method:

$$\text{Score} = \sqrt{\frac{\text{innovation}^2 + \text{implementation}^2}{2}}$$

The resulting overall scores are then ranked and used for percentile comparisons.

The RMS method, in comparison with a straight summation or average of individual innovation and implementation values, rewards companies for standout performances.

For example, using this method, a company with an innovation score of nine and an implementation score of one would score considerably higher than a company with a score of five in both areas, despite the mean score being the same. ABI Research believes that this is appropriate as the goal of these matrices is to highlight those companies that stand out from the others.

RANKING CRITERIA

Leader: A company that receives a score of **75 or above** for its overall ranking

Mainstream: A company that receives scores **between 60 and 75** for its overall ranking

Follower: A company that receives a score of **60 or below** for its overall ranking

Innovation Leader: A company that receives a score of **75 or above** for its innovation ranking.

Implementation Leader: A company that receives a score of **75 or above** for its implementation ranking.

INNOVATION CRITERIA

Product Innovation: This metric focuses on innovation as a function of two predominant strategies: in-house organic development and relevant investments and acquisitions. There are also focused acquisitions that fit neatly into an organic growth plan, enabling vendors to add complementary capabilities to existing product lines. It also enables vendors to acquire new customers more quickly and efficiently than they can following a go-it-alone strategy, potentially giving their core automation business a new leg of growth.

Cloud-Native Tools: Cloud-native technology is growing to become a key dimension of the industry. This metric considers vendors' innovation and investment in cloud-native tools and methodologies. Next-generation, software-centric networks stand to be dynamic, distributed, and programmable. That, in turn, necessitates a cloud-centric approach to automation and orchestration capabilities built on cloud technologies that allows for fast evolution.

Data Science and Telco Domain Expertise: Advanced analytics with Artificial Intelligence (AI)/Machine Learning (ML) capabilities are critical for CSPs to embrace full closed-loop automation and progress toward software-centric networks, but they are not enough. There must be telco domain expertise that touches on the complexity and uniqueness of cellular networks. This specific metric focuses on capturing the importance of that blend.

Event and KPI Correlation at Scale: This specific metric aims to capture vendors' ability to monitor, log, and process to gather actionable insights at scale from a wide range of domains and network elements, and the ability to correlate that information for timely action. Correlation for anomaly detection and locating source of fault with hundreds of thousands of KPIs being generated every second, spread across multiple domains and a wide range of elements, remains a significant scale challenge.

Operational Effectiveness: This metric considers vendors' readiness to provide an environment of supporting automation products, interfaces, and industry-standard processes and architecture. Credit has been given for input that demonstrates strong formal partnerships, and preconfigured service and resource packages and artifacts (flows, templates, etc).

IMPLEMENTATION CRITERIA

Wide Range of Engagement Models: There are multiple market trends that reinforce the importance of this metric. First, vertical openness (Cloud Radio Access Network (RAN)) and horizontal openness (Open RAN) means that there is a need for system integration to feature alignment, performance, security, and lifecycle management. This goes beyond interoperability supported by The 3rd Generation Partnership Project (3GPP). Second, increasingly, CSPs are on the lookout to buy business outcomes, as opposed to just automation technology features. They seek a partner that helps them implement automation and orchestration functionality, but also a partner that takes over and acts on their behalf in all aspects of technology, from building software-centric networks and apps, to defining architecture to managing workloads.

Horizontal, Cross-Network, and Cross-Cloud Platform Automation: This specific metric focuses on a broad automation capability, so a range of network domains (core, radio, transport, etc), cloud platforms, and software solutions that suppliers' automation products support. Vendors' ability to enable horizontal deployments across architectural boundaries that span both lower-layer resource orchestration and higher-level service orchestration carries a greater weight here.

Vertical, Cross-Layer Stack Monitoring: This metric focuses on vertical automation and assurance, so monitoring and lifecycle management across multiple vertical stack layers, including cloud Operating System (OS), Operations Support System (OSS) integration, Application Programming Interface (API) integration, Container Network Function (CNF)/Virtual Network Function (VNF) management, etc.

Integration with Public Cloud and On-Premises Infrastructure Vendors: This metric focuses on integration and interworking with public cloud and horizontal infrastructure providers. Hosting telco workloads in a public cloud remains a function of performance in terms of reliability and functionality. However, the eventual requirement to integrate specific telco workloads and public cloud is inevitable. Automation and orchestration solutions will need to factor that in.

Proofs of Concept (PoCs), Pilots, and Commercial Launches: This metric aims to capture market penetration, geographic reach, and sales of automation and orchestration solutions for each respective supplier.

OVERVIEW

Broadly speaking, vendors included in this report fall under the following groups: 1) network hardware vendors investing to build an automation software business; 2) network automation and orchestration software vendors; and 3) new software vendors that are emerging in the market. For example, Ciena, Cisco, HPE, and Juniper have a strong base business in network and server equipment. For these vendors, automation software is arguably one part of a larger hardware-based offering. That may well mean that cloud and automation/assurance software does not totally help these vendors drive revenue in the way that their mainstream organization is structured to drive revenue. So, unless there is an arrangement in place that separates the interface between mainstream (hardware) business and (new) high-growth automation businesses (e.g., Elisa Polystar, the software arm of Elisa in Finland), these vendors' processes sharpened for mainstream business may have to be adapted to make judgment calls needed for an automation software business correctly.

On the other hand, for Amdocs and Netcracker, automation and orchestration software is their base business. These sell industrial-strength automation and orchestration solutions, and they complement their software business with a services capability. These vendors continue to be highly entrenched in the market. They have a deep understanding of CSPs' competitive environment, they have a large installed base for single- and cross-domain automation projects, and they stand behind some large-scale network transformation deals in the industry. This set of competitive advantages continues to serve them well in winning business. Arguably, the market views these vendors as the go-to companies for automation and orchestration solutions. Amdocs and Netcracker come out on top of this competitive assessment.

But there is competition by other vendors, namely Comarch and Itential, among others. These vendors continue to innovate their offerings to win market share in a constantly developing and changing marketplace. Indeed, change is one of the few things that remains constant in this period of transition for the industry. The dominant vendors help equip CSPs with the skills to succeed in building a hard-to-duplicate network based on cloud tools, software, and DevOps methodologies. Vendors that stand to win business will develop automation software that does not just serve CSPs' network requirements, but also helps them deal with the relentless, discontinuous change that software creates.

OVERVIEW

The key takeaway, however, for all vendors irrespective of market positioning, is to be clear on three items:

- 1) Commercial Benefits That CSPs Will Gain from Automation Solutions:** Maximize operational efficiencies and/or improve market share or revenue.
- 2) Realize Ecosystem Simplification to Realize Those Benefits:** This is critical, particularly when we consider that CSPs do not develop their own automation software. They procure it, and they procure it from many different suppliers.
- 3) Unify Solutions to Create Value:** Given that each supplier' automation solution is characterized by proprietary, and therefore different, naming conventions, data formats, and interfaces, who is going to bring it all together in a way that creates value for CSPs?



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