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Service design and orchestration: worldwide market shares 2022

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About this report

This report provides market share data for communications service provider (CSP) spending on telecoms-specific service design and orchestration software systems and related services for 2022. It provides details of how the spending varied by delivery model, vendor and region. The report also includes profiles of the leading vendors in the market.

It is based on several sources, including:

- interviews with CSPs and vendors worldwide
- Analysys Mason's research conducted during the past year.

GEOGRAPHICAL COVERAGE

- Worldwide
- Central and Eastern Europe
- Developed Asia–Pacific
- Emerging Asia–Pacific
- Latin America
- Middle East and North Africa
- North America
- Sub-Saharan Africa
- Western Europe

KEY QUESTIONS ANSWERED IN THIS REPORT

- What was the overall size of the market (service design and orchestration software systems for the telecoms industry) and what drove this spending among CSPs?
- Who are the major vendors and what is their share of revenue in the service design and orchestration systems market?
- What are the different drivers and growth rates of CSP spending on products and professional services?

WHO SHOULD READ THIS REPORT

- Vendor strategy teams that need to understand the key areas of growth.
- Product management teams that are responsible for feature functionality and product marketing teams that are responsible for market share growth.
- Market intelligence teams at vendors that want to understand how their competitors compare with each other.
- CSPs that are planning digital transformation journeys and want to ensure that their current vendors are staying up to date.

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The SDO market grew by 6.4% year-on-year in 2022 at a greater rate than in 2021 following market trends and adjusting for the turbulent economic climate
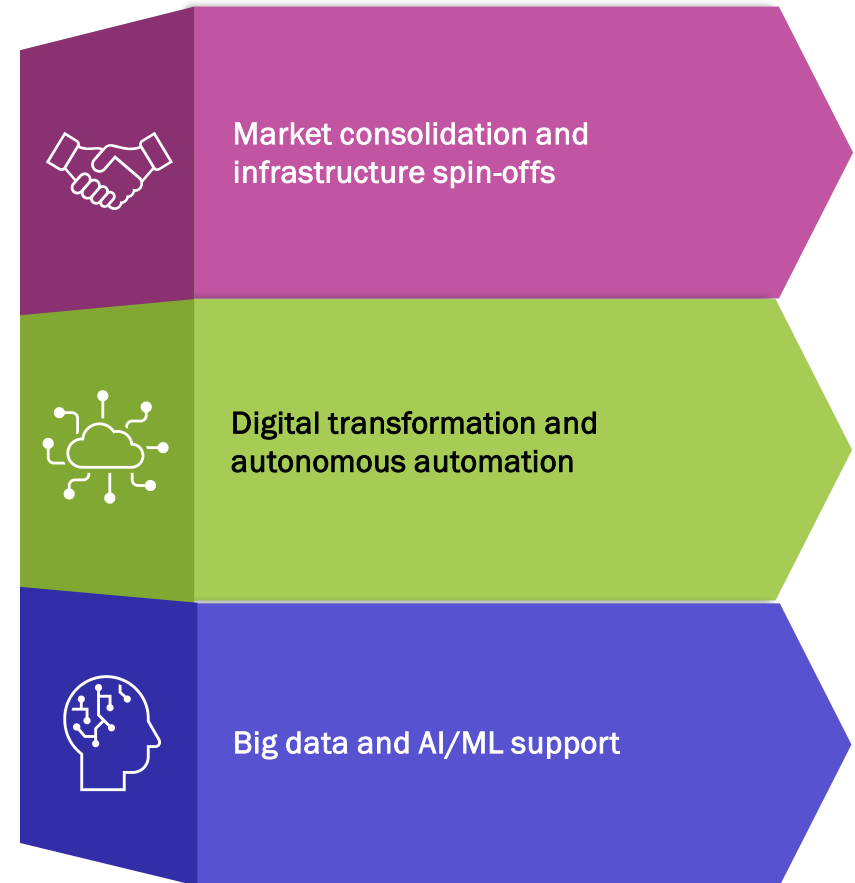
The service design and orchestration (SDO) market grew by 6.4% in 2022, driven by the telecoms industry's efforts to adapt to the 5G era. CSPs are transitioning their products to cloud-native architecture with open APIs for service agility and any-cloud deployment. This has enabled the automation of workflows for next-generation enterprise services.

M&A and structural separations are reshaping the telecoms market, driving OSS system consolidation and operational scale. Operator structural changes create issues with numerous siloed systems requiring consolidation and updates to simplify internal processes and to expose network data to third parties for infrastructure sharing.

As such, digital transformation is becoming increasingly important, helping CSPs to meet the evolving needs of customers and unlocking new business opportunities. Automation is now critical in helping CSPs to navigate the complexities of 5G and adapt to rapid service changes. As high-quality big data assumes a dual role – fuelling day-to-day operations and supporting AI and ML systems – the demand for near real-time support and updates in pivotal systems, such as inventory management, is vital.

In summary, the SDO market in 2022 experienced significant growth fuelled by 5G advancements, M&A activities, digital transformation and AI integration. Automation is poised to play a pivotal role in shaping the future of service offerings in the telecoms sector.

Figure 1: Key drivers of growth in the service design and orchestration market, 2022

Market consolidation and infrastructure spin-offs

Digital transformation and autonomous automation

Big data and AI/ML support

Source: Analysys Mason

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5G continues to be a key driver of automated SDO, both in terms of traditional requirements and as an enabler of a diverse range of new use cases
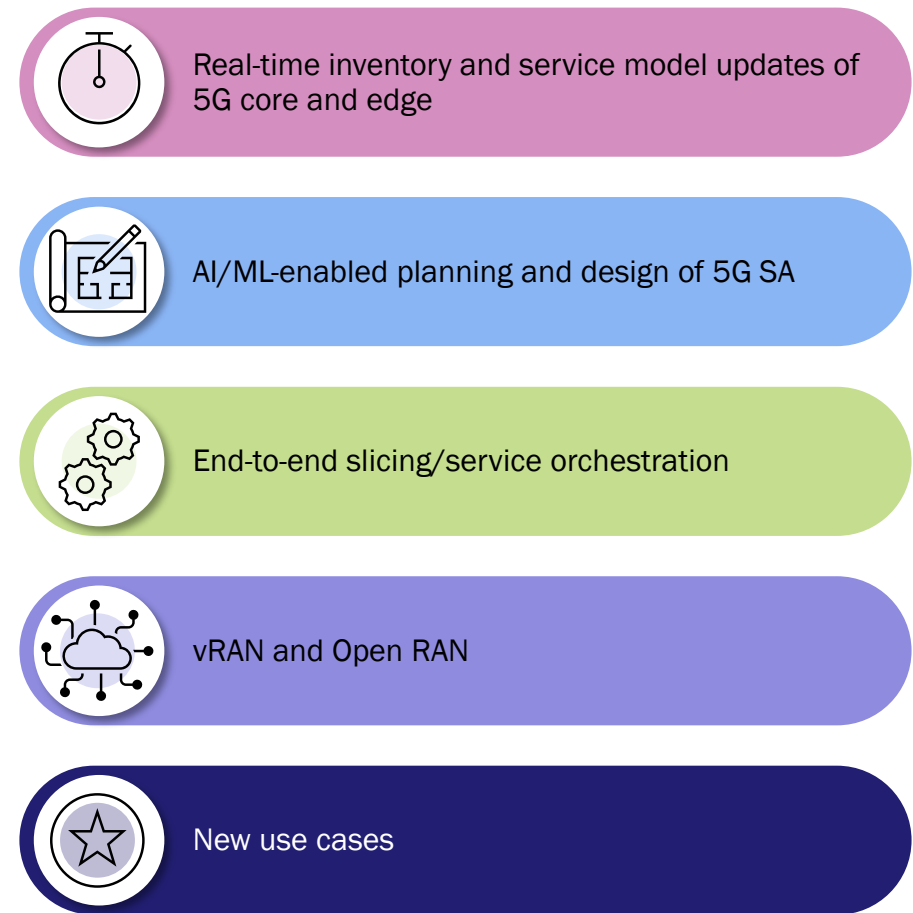
CSPs are accelerating their shift to 5G standalone (SA) networks to meet the growing demand for comprehensive 5G experiences from end users and enterprises. This transition to 5G SA networks brings about new challenges in managing the increasing number of IoT connections, virtual network functions (VNFs) and cloud-native network functions (CNFs). Additionally, the rise of hybrid private network models, combining on-premises 5G and CSP-provided network slices, introduces complexities in service orchestration.

To cater to this dynamic landscape, CSPs are starting to invest in vRAN technology. This has led to some growth in vRAN spending, necessitating innovation in network and service inventory systems to support the cloud-based environment.

Automation and orchestration are becoming crucial for CSPs to manage the complexity of 5G SA networks and enable the rapid deployment of next-generation services. Network slicing is also gaining prominence, requiring advanced orchestration solutions and automation tools that can work across domains and vendors to offer differentiated services based on SLAs.

AI/ML-powered network slice optimisation solutions are essential for resource scaling and anticipating network conditions. Furthermore, intent-based networking solutions are being adopted to facilitate autonomous configuration and optimisation of networks, creating an abstraction layer for operators to define high-level network requirements.

Figure 2: Key 5G-related SDO market drivers

Real-time inventory and service model updates of 5G core and edge

AI/ML-enabled planning and design of 5G SA

End-to-end slicing/service orchestration

vRAN and Open RAN

New use cases

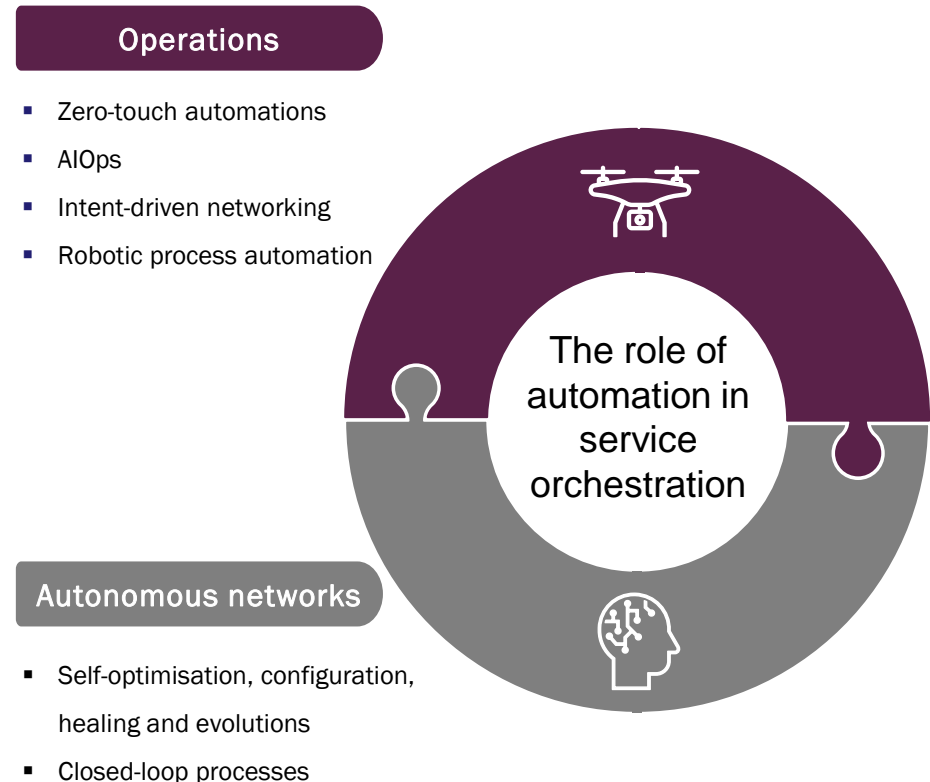Source: Analysys Mason

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SDO systems are the foundation of autonomous networks and will play a key role in reducing costs, improving customer experience and enabling new revenue streams

According to an Analysys Mason survey, as of 2022, 70% of CSPs had initiated automation in their assurance and orchestration functions, with an additional 20% planning to begin their automation journeys in the next year.[1] Such widespread adoption of automation and AI technologies is driven by the increased opex pressure and slow monetisation of 5G services. AI-enabled orchestration systems are essential for improving resource allocation, traffic management and service provisioning, leading to enhanced efficiency for CSPs. Automation and AI are being tested for engineering systems as well, with CSPs deploying drones for site inspections and testing AI-generated site billing.

Automation and AI-driven optimisation solutions are not only improving margins but also addressing environmental concerns. CSPs can use AI to increase energy efficiency, manage resources and implement shutdown models during low-load conditions to minimise energy consumption. Some vendors are already pursuing inventory system updates to account for energy KPIs as operators face pressure from both consumers and regulators.

CSPs are progressively moving towards fully autonomous networks with closed-loop automation. However, this journey involves incremental modernisation and system consolidation. This approach enables CSPs to increase levels of automation while leveraging existing OSS investments.

Figure 3: The role of automation in service orchestration

Operations

- Zero-touch automations
- AIOps
- Intent-driven networking
- Robotic process automation

The role of automation in service orchestration

Autonomous networks

- Self-optimisation, configuration, healing and evolutions
- Closed-loop processes

Source: Analysys Mason

[1] For more information, see Analysys Mason's *End-to-end automation: opportunities, challenges and the state of deployment*.

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Key recommendations

1

Vendors must develop comprehensive end-to-end orchestration solutions to help CSPs to realise the full potential of 5G network services, including B2C, B2B, and B2B2X offerings.

As 5G networks evolve to meet diverse user requirements, the need for seamless co-ordination and automation across different network and service domains becomes increasingly essential. Multi-domain orchestration must ensure that different service components, both in the cloud and on-premises, work in harmony to meet the unique demands of both B2C and B2B clients.

2

Vendors should ensure that their solutions give CSPs control and a view of all physical and virtual network elements and resources.

Effective delivery of 5G services and infrastructure sharing will depend on CSPs' ability to tap into all underlying network domains, which, when combined with AI/ML, can help to anticipate network conditions, resource utilisation and performance to identify potential failures in advance. AI/ML may also link previously supplied services, assisting CSPs in selecting templates for new services and maintaining their 5G service portfolio.

3

Vendors must embrace a vendor-agnostic, zero-touch automation approach to enable integration with third-party APIs and help CSPs to achieve a centralised network management and orchestration platform.

Vendors supporting true vendor-agnostic architecture will have substantial advantages over competitors because such an architecture would enable simpler operations and programmatic network control across network domains and silos. This approach offers more flexibility in terms of the choice of products and applications, and will support CSPs' objectives to reduce the TCO of existing networks.

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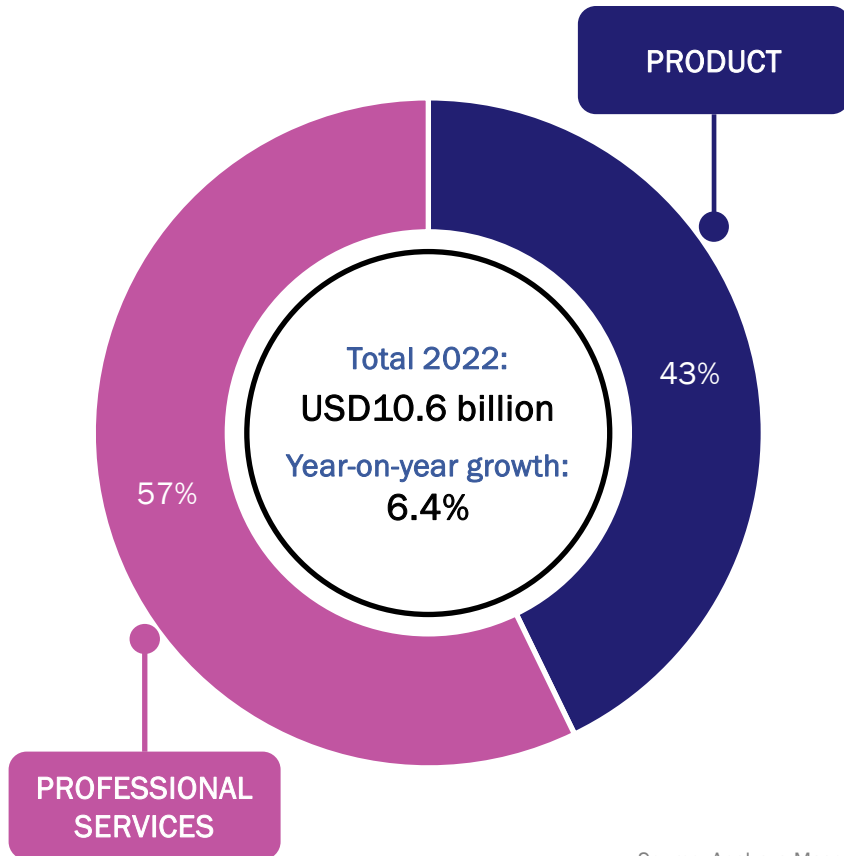
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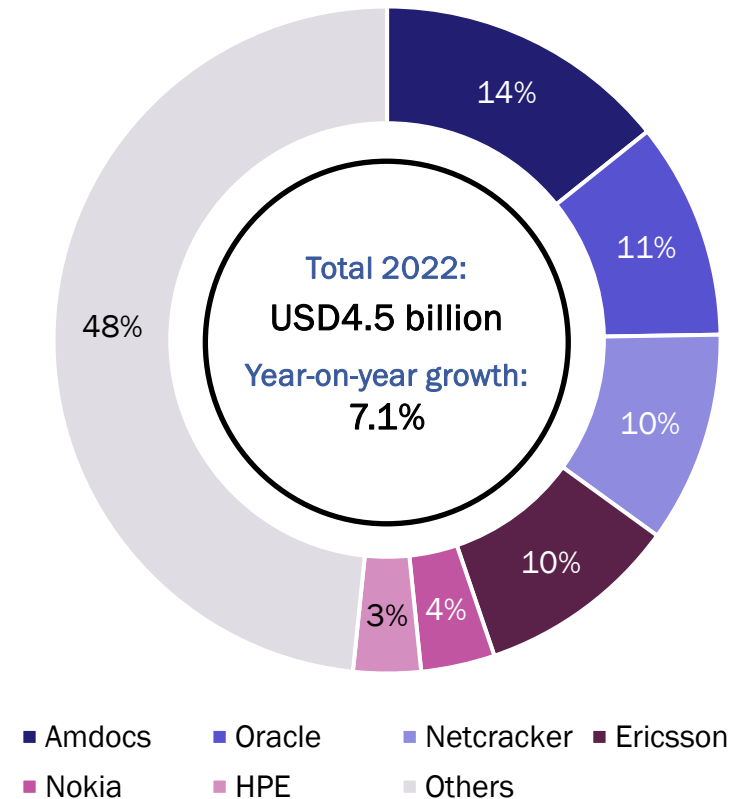
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Service design and orchestration revenue market share

Figure 4: Service design and orchestration total revenue by type, worldwide, 2022

Figure 6: Service design and orchestration product revenue by vendor, worldwide, 2022[1]

PRODUCT

Total 2022:
USD10.6 billion
Year-on-year growth:
6.4%

43%

57%

PROFESSIONAL SERVICES

Total 2022:
USD4.5 billion
Year-on-year growth:
7.1%

14%

11%

10%

10%

48%

3%   4%

■ Amdocs   ■ Oracle   ■ Netcracker   ■ Ericsson
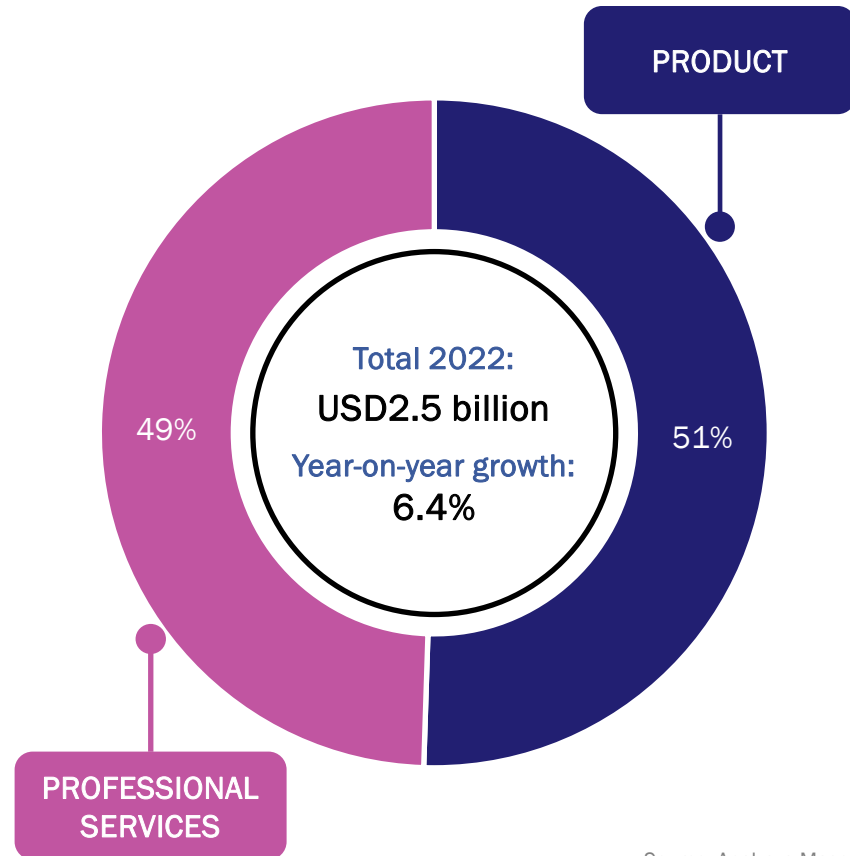■ Nokia   ■ HPE   ■ Others

Source: Analysys Mason

Source: Analysys Mason

[1] Other vendors include Amazon Web Services, AsiaInfo, Atos, Capgemini, Ciena, Cisco, Cognizant, Comarch, Concentrix, CSG International, Deloitte, Enghouse Systems, GE Smallworld, Hansen Technologies, HP Enterprise, Huawei, IBM, Infosys Technologies, Infovista, Keysight, Salesforce, Sandvine, ServiceNow, Subex, Synchronoss, Tata Consultancy Services, TEOCO, TIBCO, Tieto, Viavi, VMware and Wipro Technologies.
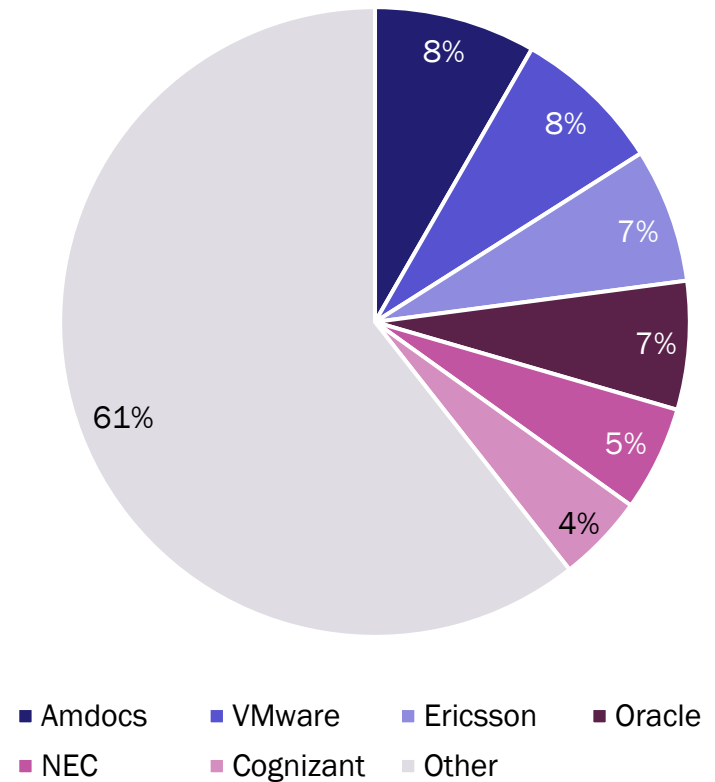
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End-to-end orchestration revenue market share

Figure 8: End-to-end orchestration total revenue by type, worldwide, 2022

Figure 9: End-to-end orchestration total revenue by vendor, worldwide, 2022[1]

PRODUCT

Total 2022:
USD2.5 billion
Year-on-year growth:
6.4%

51%

49%

PROFESSIONAL SERVICES

8%

8%

7%

7%

5%

4%

61%

■ Amdocs   ■ VMware   ■ Ericsson   ■ Oracle

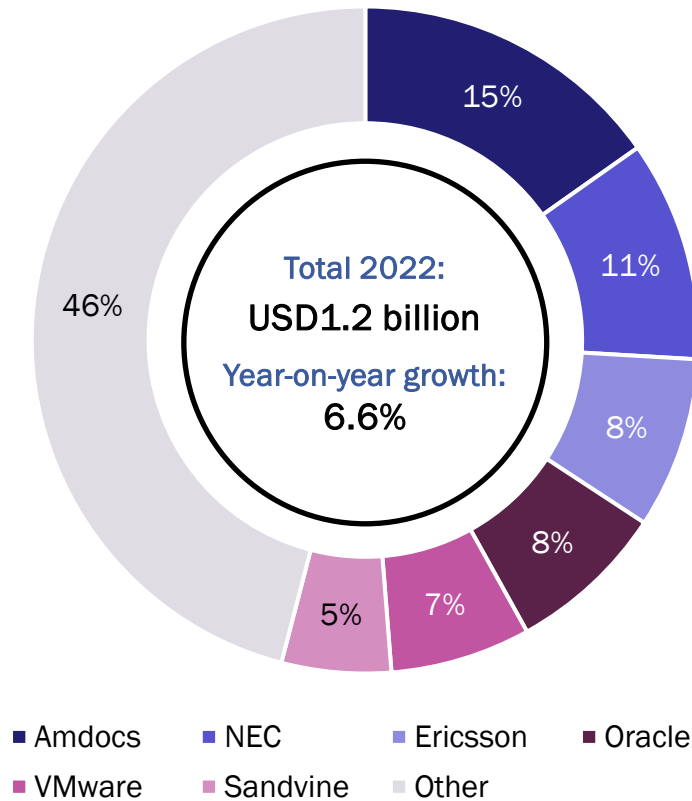■ NEC   ■ Cognizant   ■ Other

Source: Analysys Mason

Source: Analysys Mason

[1] Other vendors include Accenture, Nokia, Guavus Thales, HP Enterprise, Infosys Technologies, Sandvine, Salesforce, ServiceNow, Tech Mahindra and IBM.

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End-to-end orchestration revenue market share

Figure 10 End-to-end orchestration product revenue by vendor, worldwide, 2022[1]

Total 2022:
USD1.2 billion
Year-on-year growth:
6.6%

15%
11%
8%
8%
7%
5%
46%

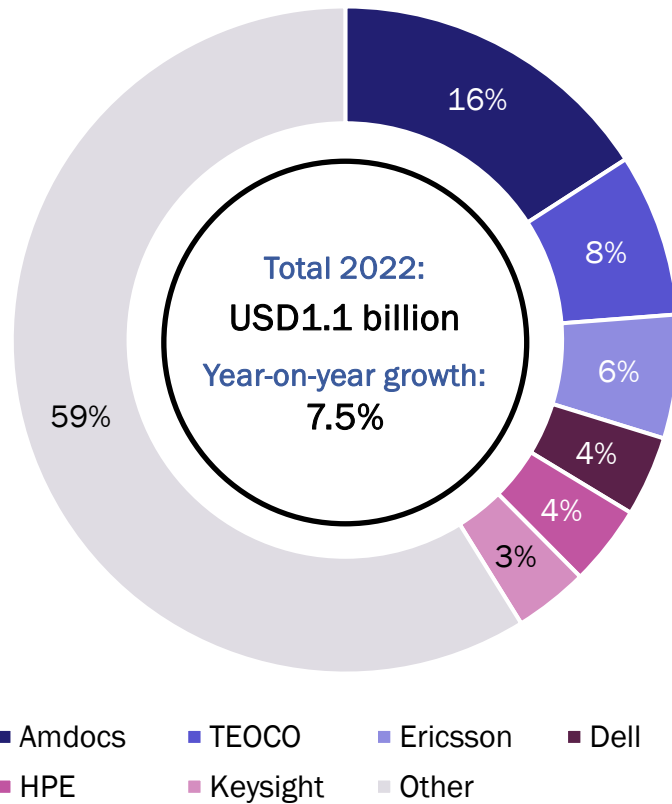- Amdocs   - NEC   - Ericsson   - Oracle
- VMware   - Sandvine   Other

Source: Analysys Mason

[1] Other vendors include Nokia, Salesforce. Cisco, HP Enterprise, Sandvine, Salesforce, ServiceNow and IBM.

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Engineering systems revenue market share

Figure 14: Engineering systems product revenue by vendor, worldwide, 2022[1]

Total 2022:
USD1.1 billion
Year-on-year growth:
7.5%

16%
8%
6%
4%
4%
3%
59%

■ Amdocs   ■ TEOCO   ■ Ericsson   ■ Dell
■ HPE   ■ Keysight   ■ Other

Source: Analysys Mason

[1] Other vendors include Accenture, Infosys Technologies, Cisco, Nokia, IBM, Tech Mahindra, Ciena and IBM.

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Amdocs: strategy overview

Amdocs is a leading software solutions and services vendor that specialises in providing operational support for the telecoms, media and entertainment industry.

With over 40 years of industry expertise, Amdocs is a leading provider of software and services to communications and media companies. It offers market-leading capabilities for service providers' automation journeys and is recognised as the market leader for SDO products.

The Amdocs Intelligent Networking Suite is a comprehensive solution that enables holistic end-to-end service lifecycle automation. It offers design, orchestration, continuous monitoring, and closed-loop operations across physical, virtual, cloud, and hybrid networks. The suite is cloud-native, leveraging microservices-based architecture and is an open solution. It supports multi-cloud and modular deployment, integrating with ONAP aligned and partner ecosystem components, while aligning with TMF, MEF, and ETSI APIs. The Amdocs Intelligent Networking Suite facilitates key solutions and automation journeys such as OSS modernisation, digital-to-network automation, end-to-end service and network orchestration, 5G slice and edge automation, and Network-as-a-Service.

Amdocs continuously integrates AI, low-code and security into all of its new technologies, providing a comprehensive portfolio of B2C, B2B and network solutions.

Figure 30: Key data

Company details	- Founded in 1982 in Israel - Headquartered in Chesterfield, Missouri, USA 31 000 employees - Operations in more than 85 countries
Revenue	Total revenue in 2022: USD4.7 billion (+8.1% year-on-year)
Key customers	AT&T, Bell Canada, BT, Comcast, Globe Telecom, KT, Orange, Rogers, Telefónica, T-Mobile USA, Verizon, Vodafone
Partnerships	AWS, Airspan, Allot, Atrinet, Dell, Intel, Microsoft, VMWare
Professional services, products and solutions	Amdocs Service Orchestration, Amdocs Service Activation, Amdocs Network Orchestration, Amdocs Network Inventory, Amdocs Intelligent Networking Suite.

Source: Analysys Mason

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Amdocs: analysis

Amdocs' OSS solutions are widely recognised for their scalability, flexibility and ability to support complex networks and services in the telecoms industry.

Amdocs has recently updated one of the key components in the portfolio – Amdocs Network Inventory. It is a comprehensive, solution that covers all network layers, from the physical network underlay – including both inside and outside plant infrastructure – to the service overlay, including VNF and CNF management.

Amdocs has also strengthened its partnership with SES by providing anomaly detection, monitoring, diagnostics, and remediation services for SES's O3b mPOWER satellite communications system.

Additionally, Amdocs has entered a multi-year agreement with Telefónica Hispanoamerica to modernise its BSS and deploy cloud-native OSS modules on the public cloud in Telefónica Argentina, Telefónica Chile, and Telefónica Peru. Amdocs has also demonstrated its capabilities in 5G network slicing through an end-to-end proof of concept (PoC) with A1 Telekom Austria Group. The PoC showcases Amdocs' service and network orchestration, enabling on-demand connectivity for users and enterprises by deploying, managing, and monetising 5G network slices. This project highlights Amdocs' flexible and vendor-agnostic approach, simplifying the provisioning and lifecycle management of 5G network slices.

Figure 31: Key strengths and weaknesses

Strength	Description
Portfolio expansion	Amdocs has completed an acquisition of TEOCO's unit including fault, performance and service management tools, as well as network and service analytics products. With new acquired capabilities Amdocs will be able to offer full OSS stack.
Large telecoms footprint	Amdocs has a large customer base of 90+ CSPs and it is working with these CSPs to further modernise and automate their services.
Comprehensive portfolio	Amdocs' solutions portfolio addresses all areas of the SDO space, including activation, order management, inventory management and engineering systems.
Flexible deployment models	Customers can choose between on-premises, cloud-hosted and hybrid deployment models.

Weakness	Description
Competition	Amdocs faces competition from big players in the SDO market such as Ericsson, Netcracker and Oracle as well as emerging players such as ServiceNow.

Source: Analysys Mason

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Service design and orchestration definitions

Figure 50: Definition of service design and orchestration and its sub-segments

SEGMENT OR SUB-SEGMENT	DEFINITION
SERVICE DESIGN AND ORCHESTRATION	Service design and orchestration systems are used to plan the future capacity and technology of the network, prepare the network to provide services and plan and implement the changes required in the network and services layer to support the services as ordered by customers.
END-TO-END ORCHESTRATION	End-to-end (E2E) orchestration systems control and report on the full lifecycle of service orders. Service orders may be requests for new services, but they may also be for the removal of services, the movement of an established service to a new address or mobile device, or changes to an established service. E2E orchestration overlaps somewhat with customer order orchestration (a part of CRM within the customer engagement market segment), but there is no double-counting in our market numbers. E2E orchestration systems may also have an associated catalogue that contains products, services and network elements, along with process fragments associated with these.
INVENTORY MANAGEMENT	Inventory management (IM) systems track the resources used to provide services, as well as the physical and logical configuration of the network to provide persistent services. They also control the assignment of the inventory to specific uses, and design special arrangements to provide special services for specific users.
ACTIVATION	Activation systems automate the explicit commands to turn on a new service. They communicate with service layer databases, network management systems, element management systems or directly with network elements.
ENGINEERING SYSTEMS	Engineering systems are a range of applications that help engineering departments to operate more efficiently. These systems often require a human interface. They include planning, equipment installation and configuration, network optimisation, hybrid SON open- and closed-loop systems, outside plant inventory and design and diagnostic tools.

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Definitions: product

Figure 51: Definition of product revenue

TYPE	DEFINITION
PRODUCT	Product revenue includes that from licence software and maintenance, as well as a proportion of SaaS revenue that reflects the value of the software product used to provide the SaaS service It also includes the proportion of the managed services revenue that reflects the value of the software product used to provide the managed services. Product revenue also includes revenue from product-related services, such as installation, training and lifecycle management services related to a specific telecoms software deployment. This category also includes professional services related specifically to a supplier's own product. These are services that only the product supplier will be able to provide in nearly all cases. Services related to third-party products are part of the systems integration sub-category.

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Definitions: professional services [1/3]

Figure 52a: Definitions of professional services and its sub-categories

TYPE	DEFINITION
PROFESSIONAL SERVICES	Professional services revenue includes all software-related service revenue that is not explicitly tied to software products. This includes revenue from hosted/cloud, outsourced operations and systems integration and other services. These definitions include all the professional services that we previously covered, but we have adjusted the definitions of particular areas to embrace cloud as a way to provide hosted IT services and to reduce the number of distinct sub-segments for professional services.
HOSTED/CLOUD	Revenue from hosted/cloud delivery services includes that that is attributed to the vendor that hosts the product for the CSP. The product can be supplied by the vendor using its own or third-party infrastructure. The product can be delivered through a private traditional or cloud-based site, or on a public cloud.
OUTSOURCED OPERATIONS	This category accounts for revenue that is associated with managing systems for CSPs. It includes business process outsourcing (BPO). This category also includes revenue generated from outsourced operations that are professional or specialist services provided by external suppliers' human resources to operate and maintain a CSP's assets, which can include all related operational responsibilities. This involves the transfer of operations from a CSP to external suppliers. In this scenario, the assets (systems and software) are owned by the CSP and reside in the CSP's environment and the supplier manages the network from a CSP co-located site or other local or regional (for example, regional NOC) site. It includes responsibility for onsite operations and related activities in a particular country or region.
SYSTEMS INTEGRATION AND OTHER PROFESSIONAL SERVICES	This category covers all new development that is carried out uniquely for the CSP. This includes business consulting, design consulting, custom development and systems integration. Overall, systems integration accounts for the largest proportion of professional services, although any of the other areas may be the focus in any given deal.

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Definitions: professional services – systems integration and other [2/3]

Figure 52b: Definitions of the systems integration and other professional services delivery type

TYPE	DEFINITION	
SYSTEMS INTEGRATION AND OTHER PROFESSIONAL SERVICES	SYSTEMS INTEGRATION	Systems integration concerns the services required to manage and deliver major telecoms software projects in the OSS, BSS, NFV/SDN software and other applications areas to meet CSPs' specific requirements. These are services that go beyond the boundaries of a single product or suite (such items are covered in the product-related services segment), and involve other systems in the CSP environment in order to meet the project's requirements. This category includes, but is not limited to: • integration with third-party (other vendor or proprietary) data sources, systems and interfaces, including VNF onboarding and data analytics/AI-driven automation applications • data loading and migration • customisation and configurations of software extensions and modules (without coding) to provide customised software features and capabilities, such as network equipment adapters, point-to-point interfaces and enterprise application integration (EAI) • detailed requirements, technical specifications and detailed designs • integration testing, not normal unit and functional system testing, such as for the integration of open multi-vendor components into a full stack solution (for example for open RAN implementations) • project management services. Services related to third-party products (not owned by the supplier) are included in this systems integration sub-category.
	BUSINESS CONSULTING	Business consulting describes advisory services in the areas of business process, workflows, organisation issues and strategic planning, such as how to enter a market or how to package a service. This includes, but is not limited to transformational strategy, business case development and ROI modelling, business process re-engineering and optimisation, organisation restructuring, optimisation and change management, assisting CSPs to develop new products and services to deliver to their subscribers (ranging from tariffs to value-added services), go-to-market strategies, regulatory compliance review and reporting requirements and marketing and campaign strategies.

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Definitions: professional services – systems integration and other [3/3]

Figure 52c: Definitions of the systems integration and other professional services delivery type

TYPE	DEFINITION	
SYSTEMS INTEGRATION AND OTHER PROFESSIONAL SERVICES	DESIGN CONSULTING	Design consulting describes the provision of advisory design services prior to the implementation of a telecoms network, software and/or system in such areas as OSS, BSS and virtualised network or cloud architecture, automation, network planning and optimisation and data or information models. These services typically contribute towards developing requirements for procuring the systems and software needed. This category includes, but is not limited to network planning and optimisation designs for both fixed and mobile networks and their transition to virtual/hybrid networks, OSS, BSS, cloud and data analytics platforms, and integrated architectural design, developing technical requirement for tender documents, high-level migration plans and roadmapping, analysis of established systems, data modelling, high-level interface definitions and designs.
	CUSTOM DEVELOPMENT	Custom development refers to telecoms software that is written specifically for an individual CSP, typically as a result of its ownership of legacy and proprietary systems, software or interfaces. It includes any development that requires coding to meet an unusual requirement, such as the development of a customised application store on an SDP or Microsoft .NET platform, an API for interfacing with legacy or proprietary systems, data migration scripts and custom plug-ins for VNF or NFV/SDN-related functional integration. This is internal development that is typically performed by large CSPs. The spending in this category only includes CSP spending on paying other firms for custom development, not the spending required for their own staff to do custom development. This includes some applications development management (ADM).

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Alex Bilyi (Research Analyst) is a member of Analysys Mason's research team in London. He holds a BEng in Chemical Engineering and an MSc in Engineering Business Management from the University of Bath, where he was part of the practice track team responsible for researching and developing new XR products for an engineering and technology consultancy.

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