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**TECHNOLOGY
COMPANIES LEADING
THE WAY IN 2022**

RECOGNIZING MARKET LEADERS

The technology landscape is constantly changing, with new solutions, new products, and new players emerging every day. This continuous state of flux can prove challenging—both for technology companies trying to understand how they stack up against their competition, as well as for companies looking for the best technology providers.

Fortunately, ABI Research analysts around the world are constantly collecting data and information from providers, partners, and end users. We routinely publish Competitive Ranking reports, which offer comprehensive insight into different markets, assessing companies' implementation and innovation strategies.

Based on these findings, we have summarized the results of our most recent Competitive Rankings.

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LEADING THE WAY

The following companies have been recognized as leaders in their market.

OVERALL LEADERS



NOKIA



vmware®

ERICSSON

utimaco®

 **HUAWEI**

 **BlueYonder**

 **AutoStore**

 **ENTRUST**

LEADERS



LIBRESTREAM



NEC



 **Red Hat**

 **HUAWEI**

ALERT
INNOVATION

swisslog

NOKIA

THALES

FUTUREX



project44

LEADING THE WAY

The following companies have been recognized as top innovators or top implementers in their market.

TOP INNOVATORS



LIBRESTREAM



NOKIA

NEC

SAMSUNG



vmware



THALES

securosys



MATICA



TOP IMPLEMENTERS



LIBRESTREAM



NOKIA



vmware



CANONICAL



swisslog

utimaco

THALES



ENTERPRISE AUGMENTED REALITY PLATFORMS

	Overall Leader	Leader	Top Innovator	Top Implementer
PTC	●		●	●
TeamViewer		●	●	●
Librestream		●	●	●
CareAR		●	●	
OverIT			●	
AMA				●
RE'FLEKT				●

PTC, TeamViewer, Librestream, and CareAR make up the leaders with overall strong innovation and implementation scores. TeamViewer's rapid acquisition and investment in the enterprise Augmented Reality (AR) space let the company hit the ground running and score strongly across all criteria. PTC, previously a winner of this assessment, ranks first again overall, although the gap between other competitors is smaller. Librestream and CareAR are competitive across criteria, despite a smaller overall footprint than TeamViewer and PTC. Librestream's excellent Artificial Intelligence (AI)/Machine Learning (ML) efforts differentiate it and lead to a second place ranking in innovation, while CareAR's recent reorganization under Xerox led to decent implementation rankings, but no standout weaknesses in innovation surmise a strong overall offering.

INNOVATION

PTC, TeamViewer, Librestream, CareAR, and OverIT are innovation leaders. PTC has been a leader in this space in prior assessments and remains a strong innovation leader today. TeamViewer's excellent use case applicability scored top marks, thanks to significant acquisition in the enterprise AR space.

IMPLEMENTATION

PTC, TeamViewer, and Librestream are included in both innovation and implementation leaderboards. TeamViewer and PTC are class leaders in terms of customers and footprint, as well as partnership ecosystem, which are important metrics as potential customers look for maturity and opportunity for expansion as investment morale strengthens. Librestream's intense focus on AI does not overshadow its strong overall footprint and great integration and time to value potential. AMA and RE'FLEKT have strong showings in implementation, while scoring lower in innovation. This suggests a proven portfolio and maturity, but lacking more advanced and forward-looking value adds with which other competitors are engaging. This is purposeful for both companies, which have focused on maintaining and growing existing products and capabilities before diving into new innovation elements, at least partially fueled by COVID-19 market dynamics.



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OPEN RAN PLATFORMS

	Overall Leader	Leader	Top Innovator	Top Implementer
Nokia	●		●	●
NEC		●	●	
Samsung			●	

The development of the Open Radio Access Network (RAN) is gaining momentum. Many Tier One Communication Service Providers (CSPs) have already started or planned their journeys to deploy an Open RAN approach across their footprints globally. Nokia and NEC earned leader recognition in ABI Research's evaluation of seven platform providers.

INNOVATION

Nokia is a leading innovator leveraging its full-stack product portfolio from core to RAN. The company is the first major incumbent vendor to join the O-RAN ALLIANCE and one of the key contributors to O-RAN specifications, including fronthaul interface and RAN Intelligent Controller (RIC) platform developments. NEC has received recognition from Mobile Network Operators (MNOs) for its product performance and, in particular, its Massive Multiple Input, Multiple Output (mMIMO) products. NEC also has a full-stack product portfolio from the core to RA, and is also active in many organizations, such as the O-RAN ALLIANCE and the Telecom Infra Project (TIP), among others. Samsung ranked third in terms of innovation. This is mainly because of its pioneer end-to-end network product provisioning, ranging from chipset to radio to core networks. Its cloud-native Virtualized RAN (vRAN) solution, including mMIMO support, has been tested in many top-tier CSPs' networks in the United States and allowed multi-vendor interoperability.

IMPLEMENTATION

Nokia is the only implementer leader. Nokia is one of the key advocates for Open RAN among the legacy RAN vendors. Considering Nokia's long history of being in the RAN and its established global coverage, Nokia is well informed, connected, and ready to address multi-dimensional challenges faced in RAN and Open RAN deployments.



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IoT DEVICE IDENTITY LIFECYCLE MANAGEMENT

	Overall Leader	Leader	Top Innovator	Top Implementer
Device Authority	●		●	●
Entrust		●	●	●
GlobalSign		●	●	●
DigiCert			●	

The rise of cyberthreats across the Internet of Things (IoT) has cost the industry tens of billions of dollars and forced organizations to increase the security spending on IoT device identity lifecycle management. This has meant revisiting Key Performance Indicators (KPIs) regarding reliability, integrity, and efficiency of connected devices, users, systems, and applications, as well as adding more identity and supply chain parameters into their existing deployment models.

INNOVATION

Device Authority ranked first for innovation, followed by GlobalSign, DigiCert, and Entrust.

IMPLEMENTATION

Device Authority ranked first for implementation, followed by Entrust, DigiCert, and GlobalSign.



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5G TELCO CLOUD-NATIVE PLATFORMS

	Overall Leader	Leader	Top Innovator	Top Implementer
VMware	●		●	●
Red Hat		●	●	●
Canonical				●
Google				●

VMware scored first in the general ranking and was the leader in innovation, with its strength coming from its robust multi-vendor Network Function (NF) partnership program and orchestration, container security, and latest innovations for telco-grade supporting features. Red Hat scored second in the general ranking, but ranked higher than VMware in implementation. For innovation, Red Hat scored lower than VMware largely due to VMware's strong multi-vendor certification program and virtualization layer for container security and multi-vendor management.

INNOVATION

CSPs are looking to enable cloud-native 5G capabilities through the deployment of a horizontal platform that can span their entire network stack. Some of the key criteria that CSPs are looking for include being able to build a multi-vendor network and avoid vendor lock-in. As the 5G Service-Based Architecture (SBA) revolves around providing services on-demand through microservices and cloud-native principles, flexibility, agility, and scalability are high requirements in this area. The top innovators with a score of 75 and above are VMware and Red Hat.

IMPLEMENTATION

The major drivers of implementation rankings include cloud-native capabilities, extent of modularity, and multi-cloud/hybrid-cloud support. The top implementers are Red Hat, Canonical, VMware, and Google. Red Hat offers both Red Hat OpenStack and Red Hat OpenShift for CSPs, with Red Hat OpenStack revolving around Virtual Machine (VM) deployments, and Red Hat OpenShift revolving around container deployment and management, with VM deployments on Red Hat OpenShift being possible with Red Hat OpenShift virtualization based on KubeVirt. Red Hat offers a fully multi-cloud offering that minimizes cloud lock-in by making applications portable, and provides a cloud abstraction layer to simplify hybrid cloud deployments.



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MASSIVE MIMO PLATFORMS

	Overall Leader	Leader	Top Innovator	Top Implementer
Ericsson	●		●	●
Huawei		●	●	
Nokia		●		●

mMIMO vendors in the “leader” category consist of Ericsson, Huawei, and Nokia. They have demonstrated leading products and innovations to compete in the market. Huawei has developed new architecture of MetaAAU to realize performance and energy-saving renovations, Ericsson launched ultralightweight mMIMO, while Nokia offered high-performance mMIMO powered by ReefShark Systems-on-Chip (SoCs).

INNOVATION

The ability to implement innovative solutions in software and hardware that enhance the performance of mMIMO is critical, as operators are seeking high-performing mMIMO at the lowest cost, weight, size, and energy consumption. The innovation metric assesses vendors’ capability to implement advanced features to improve overall system performance, reduce power consumption, and offer multi-band products and Full Division Duplex (FDD) solutions.

IMPLEMENTATION

In the implementation ranking, vendors are assessed based on the overall antennal sales market share, regional penetration level, number of networks that have been deployed by operators, product portfolio, and features that ease site installation.



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MICRO-FULFILLMENT AUTOMATED STORAGE AND RETRIEVAL SYSTEM VENDORS

	Overall Leader	Leader	Top Innovator	Top Implementer
AutoStore	●			●
Alert Innovation		●	●	●
Swisslog		●		●
Attabotics			●	
Ocado			●	

Not all micro-fulfillment Automated Storage and Retrieval System (ASRS) solutions are created equal. The solution vendors in this ranking come from various backgrounds, including material handling, picking, machine vision sorting, and mobile robotics, leading to a different level of technical maturity and areas of focus in their solutions. Most of the vendors in this list are also developing their Warehouse Management System (WMS) and Warehouse Execution System (WES). Market leaders, namely AutoStore, Alert Innovation, and Swisslog, can combine all the expertise into a flexible and scalable end-to-end solution built around ASRS. All of them are active in the e-grocery space.

INNOVATION

Alert Innovation provides a shuttle-based ASRS solution for online grocers. The solution is compact, modular, and quick to deploy. The company claims 35 issued or pending patents on ASRS and related technology. Attabotics' shuttle-based ASRS is a dense and compact solution capable of being deployed in warehouses with a minimal footprint. Attabotics' omnidirectional mobile robot can move horizontally or vertically, allowing them to move freely to any location within a grid structure where all the items are stacked. As a company with a highly successful e-grocery business, Ocado has been the poster child of cuboid ASRS. While the company has limited micro-fulfillment deployment at this stage, it is primed to become a key player with its technology.

IMPLEMENTATION

AutoStore is the undisputed implementation leader. It is the only pure-play micro-fulfillment ASRS technology supplier that is publicly listed. The company's revenue is expected to exceed US\$300 million by the end of 2021 and US\$500 million by 2022. As of 3Q 2021, the company has more than 770 systems in more than 40 countries across various industries, including Third-Party Logistics (3PL), retailer, and grocer. Swisslog has more than 2,000 ASRS installations around the world. At the same time, Swisslog is the largest and most experienced integrator of the AutoStore system with more than 170 installations worldwide. The ability to complement and support AutoStore technology is critical to gaining traction in the ASRS market.

Alert Innovation is mainly focused on grocery retail, providing its solution mainly to Walmart. As for other vertical markets, the company prefers to partner with leading systems integration and automation firms, such as Muratec. This partnership also enables Alert Innovation to expand its presence internationally.



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HARDWARE SECURITY MODULE OEMS

	Overall Leader	Leader	Top Innovator	Top Implementer
Utimaco	●			●
Thales		●	●	●
Futurex		●		●
Securosys			●	

Utimaco scored first in the general ranking and was an implementation leader. This is mostly due to a combination of a comprehensive portfolio of hardware and software based on a scalable platform, and diverse application offering. Thales ranked second on the general ranking and was among both the innovation and implementation leaders, Futurex ranked third in the general ranking due to its well-developed service product and consistent offering of applications and features on both hardware and service, and also classed as an implementation leader.

INNOVATION

Securosys and Thales are the innovation leaders in this competitive assessment. While other vendors have focused on new deployment models and flexible features, Securosys has focused on innovating within the Hardware Security Module (HSM) technology itself and is focusing on new use cases for HSM usage. Thales offers an uncontested broad range of customer options for the flexible deployment of its HSM solutions; in fact, there is little that the firm does not offer for its hardware appliances.

IMPLEMENTATION

Utimaco offered the most complete and diverse range of HSM solutions, serving all types of applications, at all price points, and in various form factors. The strength of this diversity of these offerings is possible due to the way in which it has abstracted its hardware layer from the software and firmware stacks that it has developed to layer on top. Futurex is the most developed in terms of payment offerings, with a comprehensive hardware and cloud offering that is difficult to match. Thales is an undeniable market leader in the HSM space. Its clout, reach, and expertise in the security industry makes it a stalwart with a market leading HSM product. It is, however, a step behind in terms of its cloud-based options for payment applications, although it is fast catching up.



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CENTRALIZED PERSONALIZATION AND ISSUANCE SOLUTIONS STRATEGIES, SERVICES, AND BUSINESS MODELS

	Overall Leader	Leader	Top Innovator	Top Implementer
Entrust	●		●	●
Mühlbauer		●	●	●
IAI		●	●	●
Matica			●	
Emperor Technology				●

ABI Research assessed Entrust, Mühlbauer, and IAI industrial systems as the top three market leaders. Entrust scored first in the overall ranking thanks to a broad product portfolio with strong global presence. Mühlbauer ranked second overall with a similarly broad range of printing and security technologies, as well as the most rapid rate of document personalization within the market. IAI ranked third overall thanks to it being part of the wider identity solutions provider, HID Global, and having a strong range of solutions for both passport and other government cards.

INNOVATION

Mühlbauer ranked first in terms of innovation, followed by Entrust, IAI, and Matica.

IMPLEMENTATION

Entrust ranked first in implementation with personalization and issuance solutions in more than 150 countries worldwide, having a true global presence. Mühlbauer, who ranked second in implementation has a strong product portfolio. IAI ranked third in implementation.



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DEVICE MANAGEMENT FOR MASSIVE IoT

	Overall Leader	Leader	Top Innovator	Top Implementer
Huawei	●		●	●
Nokia		●	●	

ABI Research assessed Huawei and Nokia as the market leaders, respectively. Huawei scored first in the general ranking and is tied for first with Nokia among the innovation leaders. Huawei's success is attributable to a combination of factors, including a comprehensive portfolio of device management functionalities, simplified onboarding based on a scalable platform, strong commercial flexibility, and extensive partnerships. Nokia ranked second in the general ranking and was among the implementation leaders, as well as topping the innovator ranking alongside Huawei. Nokia's success is attributable to its breadth of messaging protocols, ease of device onboarding, and ability to offer commercial flexibility.

INNOVATION

Huawei is a leading innovator. Huawei Cloud IoT leads in providing a broad array of embedded software like device agents, as well as leadership in diagnostics and business rules. Nokia has redefined itself beyond consumer mobile and into enterprise segments as a supplier to telcos and in IoT services. Nokia's device management platform is leading in innovation jointly with Huawei. Nokia excels in messaging protocol breadth and has leadership in remote configurability, too.

IMPLEMENTATION

At the core of Huawei's implementation strategy is establishing a clear partnership ecosystem based on an actionable roadmap for would-be partners to sign and test their devices or platforms with Huawei Cloud IoT's systems. Huawei's ability to invest substantially in Huawei Cloud IoT allows the company to bundle additional services like cloud storage and device shadows for commercial flexibility. Huawei's platform is interoperable, thus delivering a robust set of tools that enable customers to implement an IoT solution based on their needs.



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SUPPLY CHAIN VISIBILITY SOLUTION PROVIDERS

	Overall Leader	Leader	Top Innovator	Top Implementer
Blue Yonder	●		●	
FourKites		●	●	●
project44		●		●
Overhaul			●	

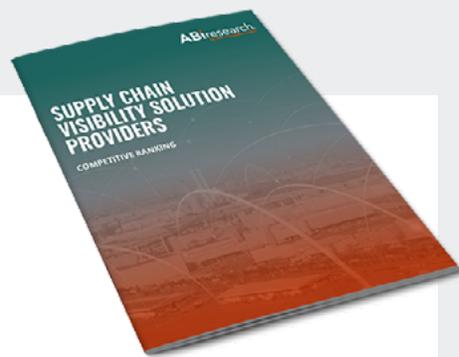
All three leaders in this evaluation—Blue Yonder, FourKites, and project44—are data aggregators. This is primarily due to two reasons. The first is because of the convergence of their capabilities across implementation and innovation, offering scalable Software-as-a-Service (SaaS) solutions alongside the ability to provide more than just track & trace capabilities. Second, as middleware platforms aggregating data from a wide variety of sources, they continue to aggregate an increasing variety of data streams from increasing varieties of devices and systems, making them an important data layer that can be directly integrated with existing enterprise systems, Business Intelligence (BI) systems, and other applications.

INNOVATION

Blue Yonder, Overhaul, and Roambee were top-rated innovators in this study. Their status here derives from their ability to address a large number of use cases due to the completeness of their supply chain digital twin vision, and their ability to provide high-quality insights and data solutions. Particularly as “see” functions become commoditized, these insights, data solutions, and business value through addressing a wide range of use cases become increasingly important.

IMPLEMENTATION

project44 and FourKites were the leading implementers in this study, scoring above 75. These vendors are both data aggregators, relying on ingestion of carrier telematics data, contextual data sources, enterprise systems, and a varying number of technology partner solutions. Their presence at the top of the implementation rankings highlight the importance of solution scalability, plug-and-play SaaS, and regional effectiveness for international flow coverage, as well as training and support, and partnering with a wide variety of other ecosystem participants.



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157 Columbus Avenue
New York, NY 10023
United States
Tel: +1 516-624-2500
www.abiresearch.com

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LEAD THE WAY IN 2022 AND BEYOND

With 2022 already in full swing, there are still ample opportunities to set yourself apart from your competitors in your market. Whether you are a technology innovator, implementer, or both, ABI Research has the expertise, data, and insight you need to gain a competitive advantage.

Since 1990, we have partnered with hundreds of leading technology brands, cutting-edge companies, forward-thinking government agencies, and innovative trade groups around the world. Through our leading-edge research and worldwide team of analysts, we deliver actionable insight and strategic guidance on the transformative technologies that are reshaping industries, economies, and workforces today. To learn more, or to discuss your plans for 2022 and beyond, contact us today.

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