ISG Provider Lens™

2021

Internet of Things - Services and Solutions 2021

imagine your future®

ISG (Information Services Group) (NASDAQ: III) is a leading global technology research and advisory firm. A trusted business partner to more than 700 clients, including 75 of the top 100 enterprises in the world, ISG is committed to helping corporations, public sector organizations, and service and technology providers achieve operational excellence and faster growth. The firm specializes in digital transformation services, including automation, cloud and data analytics; sourcing advisory; managed governance and risk services; network carrier services; technology strategy and operations design; change management; market intelligence and technology research and analysis. Founded in 2006 and based in Stamford, Conn., ISG employs more than 1,300 professionals operating in more than 20 countries — a global team known for its innovative thinking, market influence, deep industry and technology expertise, and world-class research and analytical capabilities based on the industry's most comprehensive marketplace data. For more information, visit www.isg-one.com.

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Definition

The Internet of Things (IoT) is growing at a fast pace, accelerated even more by the integration of new technologies. According to various reports, IoT devices will account for up to 50 percent (14.7 billion) of all global networked devices by 2023. Across industries and geographies, sensors collect data that feeds applications to help businesspeople make decisions, optimize business processes, reduce downtimes and improve customer service. IoT is changing from small, tempered pilot projects to concrete, scalable industry-specific scenarios.

Most enterprises lack complete skills to embrace the IoT, so the market needs capable service providers. In this study, ISG examines IoT services as the conglomeration of functions including consulting and implementation; technology integration and execution, including analytics and security; and overall IoT ecosystem management via managed services. The vast amount of data at the collection point often requires extended edge computing, including using artificial intelligence for analysis and to decide which data to send to other parts of the network. As companies rely on the accuracy of the data collected, security at the IoT endpoints is critical.

The increasing digitalization of production and the often-discussed concept of digital twin reflect a focus on business outcomes. IT/OT convergence offers end-to-end integration of data via the integration of IT systems with operational technology (OT) systems to monitor events, processes and equipment. The desired result is to improve business outcomes. Connected mobility is an example to examine providers' capabilities spanning cross-industry applications such as predictive maintenance, product development, decision-making support and business process integration.

The ISG Provider Lens™ study offers IT decision-makers:

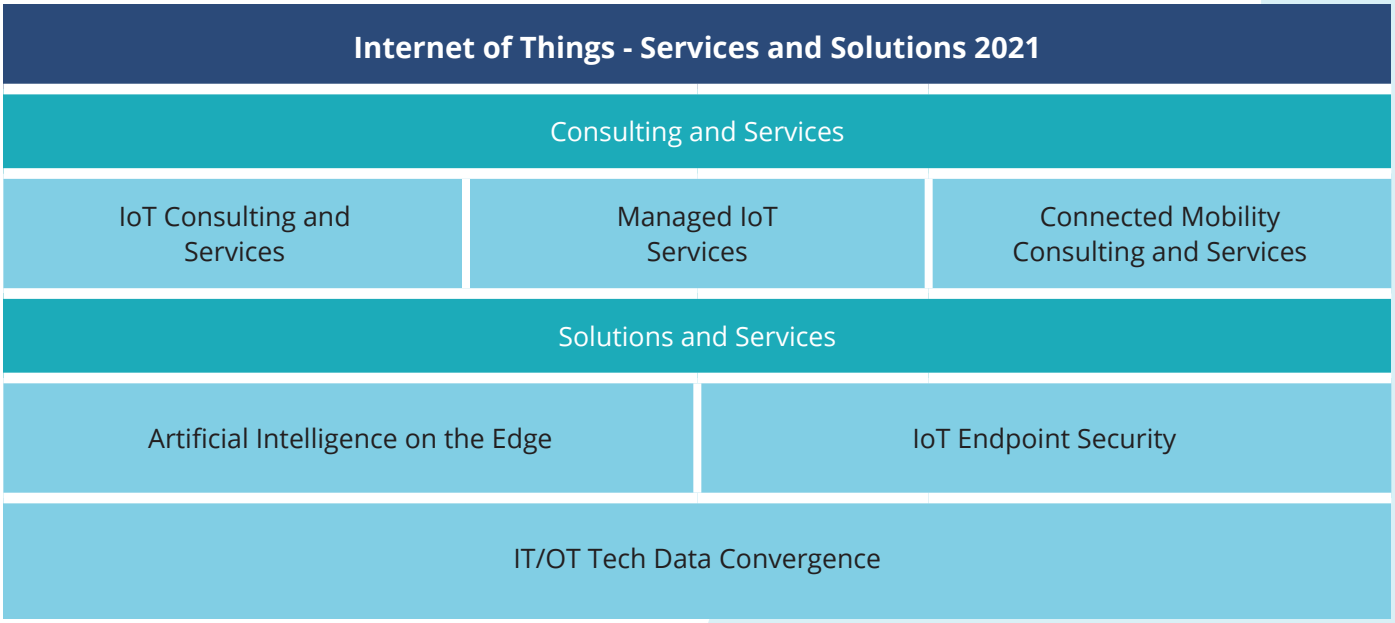
- Transparency on the strengths and weaknesses of relevant providers;
- A differentiated positioning of providers by segments;
- Focus on different markets, including Global, U.S. and Europe

Our study serves as an important decision-making basis for positioning, key relationships and go-to-market considerations. ISG advisors and enterprise clients also use information from these reports to evaluate their current vendor relationships and potential new engagements.

Quadrants Research

As part of this ISG Provider Lens™ quadrant study, we are introducing the following six quadrants on IoT services and solutions:

Simplified illustration



Source: ISG 2021

IoT Consulting and Services

IoT consulting and integration encompasses a variety of services. IoT consulting lays the groundwork for successful integration of IoT technology into business processes, the business model and the IT environment, both considering the client's specific industry and providing new, cross-industry perspectives. Consulting services include planning, development of competitive business cases and overall cost and ROI analysis. Integration services provide full or partial project management, technology integration and project execution services on the levels of device, platform, network, data storage and analytics, applications and security. Based on the requirements of the client's connected framework or ecosystem, service providers are enabling the right mix of technologies and partners to achieve defined business outcomes.

This quadrant also provides deep analysis of specific provider services for the IoT environment, including edge computing consulting and implementation, data collection and analysis, consistent security concepts including endpoints and networks and the integration of the latest technologies, such as artificial intelligence (AI) and machine learning (ML).

Eligibility criteria:

- Ability to develop an end-to-end roadmap, implement a pilot deployment, lay out a strategy for deployment at scale, integrate adequate security, networking and data analytics and build proofs of concept (PoCs) with clients
- Ability to provide end-to-end integration and implementation support to clients by involving themselves across an IoT value chain that includes devices, sensor integration, analytics, data and visualization, networks and integration into enterprise applications including ERP, CRM and MES
- Consulting services include strategic planning for dedicated and cross-industry market development, product and business model development, R&D focus and spending, integration of their own and third-party innovations and integration of upcoming technologies such as AI, augmented reality, blockchain and 5G

Managed IoT Services

Management of the overall IoT ecosystem by service providers should enable scalable IoT solutions and managed connectivity solutions for ongoing IoT-enabled business operations. Comprehensive managed service solutions include management of security, cloud, networks, device/equipment, data, platforms, applications and IoT analytics. The IoT analytics offerings include data management and intelligence to improve business outcomes, predictive analytics and data visualization to bolster operations and IoT analytics platform maintenance for scalability. Enterprises that have already implemented IoT systems and solutions need extensive support in managing these systems and upgrading them. Also it is important to inject change as needed to take advantage of emerging technologies such as 5G, augmented reality and AI.

Eligibility criteria:

- Support of active clients across the IoT value chain with use cases and market awareness of such services
- Partnerships that provide complementary capabilities to support managed services needs of different clients and applications
- In-house skills, resources and solutions to support IoT implementations
- Product roadmaps reflecting industry trends and relevant innovation initiatives
- Expansion plans and vertical focus on key industries and regions

Connected Mobility Consulting and Services

Improved outcomes are available via intelligent connectivity in the transportation and logistics industries. For example, to improve vehicle maintenance and driver experience, navigation, entertainment and communication systems in connected vehicles can communicate with each other digitally. To bolster reliability and safety and maintain schedules, connected vehicles can also digitally interact with the outside world, including transportation infrastructure, networks, weather data sources and other elements. Autonomous capabilities integrated into mobile transportation modes improve safety and can lower costs. Applications are emerging not only in the heavily hyped consumer automotive sector but also for long-haul trucking, mining using heavy equipment and surveillance and assessment using commercial drones.

Eligibility criteria:

- Evidence of active clients for which service providers offer consulting, implementation and integrated systems and services across the connected transportation and logistics value chain
- Research and development resources, including product engineering, and commitment to develop and test relevant emerging technologies. Product roadmaps reflecting industry trends and relevant innovation initiatives
- Comprehensive partner ecosystem to address industry-specific requirements as well as emerging technologies, regional support and specialized systems
- Coverage of security, including security engineering for improved controls in operations, as well as expertise in protecting mobile transportation and logistics ecosystems
- Expertise in network and connectivity engineering, including 5G and the edge

Artificial Intelligence on the Edge

IoT edge systems produce massive amounts of data that often cannot be transferred into central storage rapidly, securely and without interruption. This latency significantly limits the analytical capabilities for certain applications within the IoT solution. To address these shortcomings, innovative edge systems integrate AI applications to undertake certain complex analytics on the edge. This edge capability allows the system to make immediate decisions and take fast actions locally, without being dependent on the analytics capabilities of centralized systems.

AI-on-edge providers deliver end-to-end strategies and solutions for edge systems, integrating dedicated AI functionalities. Their services include overall edge development strategies combined with current and predicted AI and ML/deep-learning capabilities. Providers can build, deliver and maintain the solution either on their own or within a frame contract that includes support of partners and third-party providers.

Eligibility criteria:

- Providers' services include the creation of a strategy for AI-on-edge solutions, including definition of use cases, edge AI functionalities and key deliverables, building blocks and requirements, prototyping and deployment at scale
- Providers have a deep understanding of AI and experience with ML and deep-learning technologies, including frameworks for data collection, modeling, validation, and the production of a deep-learning model, as well as aspects such as dedicated hardware/chip design optimized for AI and ML operations (MLOps), but also understanding of black box and AI ethics dilemmas and resolution strategies
- Providers have a deep understanding of IoT edge solutions and experience in the development of edge solutions and services, including prototyping and deployment at scale, local power and networking management, managed edge solutions, edge maintenance and services

IoT Endpoint Security

The already huge and growing number of IoT sensors and devices – by some estimates, 35 billion IoT devices worldwide by the end of 2021 - pose a very specific security risk to corporations and governments alike. IoT devices are insecure by nature. They are connected but often lack the processing power for basic protections like encryption. Some device manufactures lag in building adequate security protections. Because of perceived lax security in IoT devices, IT often refuses to authorize their use. In many cases, the enterprise doesn't own IoT devices, but they are part of machinery, other devices or a services contract. At the same time, companies place heavy reliance and trust on the accuracy of IoT sensors to collect any kind of OT data used to control vital processes and facilities.

IoT endpoint security solutions and services address the unique challenges of IoT environments: establishing end-to-end security across diverse connected devices, authenticating device identities, combining effective security measures within IoT low-latency networks, providing resistance to different types of cyberattacks, allowing automated security updates and software patches, ensuring resilience and protecting data privacy.

Eligibility criteria:

- Strategic planning of IoT security requirements and security measures across multiple device scenarios, IoT system and device vulnerability assessments and security-related updating and patch procedures for IoT devices
- IoT endpoint security management on a device level, constant visibility and monitoring and reporting and threat assessment
- Insights, detection and prevention of known threats and fast action on unknown threats, contingency planning and execution support in case IoT devices are compromised in a distributed denial of service (DDoS) or similar attack
- Integration of ML and AI to enhance security functionalities, predict security failures and detect risky behavior

IT/OT Tech Data Convergence

Solutions and services for IT/OT data convergence help enterprises integrate the data and processes needed to improve business outcomes using IoT. In most enterprises, distribution of computing includes branch offices and other facilities as well as mobile connected devices. The computing ecosystem is planned, purchased and managed by IT or its service partners. Distinct from the IT ecosystem is operational technology (OT) that monitors and manages assets, whether they be manufacturing equipment, building systems or transportation assets. Decades-old OT systems are increasingly being replaced or connected to modern network infrastructures. Smart, connected devices using machine learning and automation offer much more control of industrial equipment with improved monitoring, log collection and equipment operation, which leads to better preventive maintenance to reduce unplanned downtime and improve machine longevity.

To be most effective for the business, the massive volumes of OT data need to be transferred to IT systems to be stored, combined with related data and analyzed. However, many IT departments are unfamiliar with the volume and types of incoming data from modern OT systems. IT and OT also have different priorities for security, uptime and performance that affect data convergence. Innovations such as digital twins are starting to tackle the complexities but also require that designers and engineers collaborate directly with operators on the shop floor.

Eligibility criteria:

- Ability to provide solutions and services to assess and bridge the gaps between IT and OT for IoT data management. This includes understanding of not only the systems and data from both IT and OT but also the decision-making processes and priorities of each
- Experience aligning IT and OT systems and creating an operational architecture for the convergence that reduces redundancies and expenses, and ability to leverage that experience across several industries
- Ability to advise on organization change management for non-technical IT/OT issues such as breaking down silos and cooperating across departments
- Capability to offer guidance on selecting and deploying IoT data integration solutions
- Knowledge of global and local data privacy protection requirements as well as ongoing data security threats

Quadrants by Region

Quadrants	Global	U.S.	Europe
IoT Consulting and Services		√	√
Managed IoT Services		√	√
Connected Mobility Consulting and Services		√	√
Artificial Intelligence on the Edge	√		
IoT Endpoint Security	√		
IT/OT Tech Data Convergence	√		

Schedule

The research phase falls in the period between **March and April 2021**, during which survey, evaluation, analysis and validation will take place. The results will be presented to the media in **July 2021**.

Milestones	Beginning	End
Launch	March 22, 2021	
Survey Phase	March 22, 2021	April 22, 2021
Sneak Preview	June 2021	
Press release	July 2021	

Please refer to the link to view/download the ISG Provider Lens™ 2021 research agenda:

Access to Online Portal

You can view/download the questionnaire from here using the credentials you have already created or refer to instructions provided in the invitation email to generate a new password. We look forward to your participation!

Research Production Disclaimer:

ISG collects data for the purposes of writing research and creating provider/vendor profiles. The profiles and supporting data are used by ISG advisors to make recommendations and inform their clients of the experience and qualifications of any applicable provider/vendor for outsourcing the work identified by clients. This data is collected as part of the ISG FutureSource process and the Candidate Provider Qualification (CPQ) process. ISG may choose to only utilize this collected data pertaining to certain countries or regions for the education and purposes of its advisors and not produce ISG Provider Lens™ reports. These decisions will be made based on the level and completeness of the information received directly from providers/vendors and the availability of experienced analysts for those countries or regions. Submitted information may also be used for individual research projects or for briefing notes that will be written by the lead analysts.

Partial list of companies being invited for the survey

Are you in the list or do you see your company as relevant provider that is missing in the list? Then feel free to contact us to ensure your active participation in the research phase.

ABB

Accenture

Aeris Communications

All for One

All for One Group

AllCloud

Altizon

ARM

Armis

Asaive

AT&T

Atos

Avnet

AWS IoT

Axians

Ayla Networks

Bain & Company

Birlasoft (KPIT)

Black & Veatch

Bluefruit software

Bosch

Broadcom

BT

C3.ai

C3iot

Calix

CANCOM

Capgemini

CGI

Cipher

Cisco

Clearscale

Cognizant

Computacenter

Conduent

Crosser

CSG Systems International, Inc.

Cyient

Cypress Semiconductor Corporation

Dell

Deloitte

Deutsche Telekom/TSI

Device Insight

DMI

DXC Technology

EdgeIQ

eInfochips

Emerson Automation Solutions

emids

EPAM

Equinix

Ericsson

EXL

Extreme Networks

EY

Flutura

Forcam

Freudenberg IT

Fujitsu

GE

Gefasoft

Gemalto

Genpact

Google Cloud

Happiest Minds

Harman

HCL

HERE Technologies

Hexagon Manufacturing

Hexaware

Hitachi Vantara

HPE

Huawei

IBM

Infosys

Innominds

Inseego

Insight

Intel

ITC Infotech

Itron, Inc.

Klika Tech

Logicalis

LTI

LTTS

Lumen

Marlabs

Materna

Microsoft

Mindtree

Mobilogix

Modjoul

Mphasis

nDimensional

NEC

Nemetris

Nokia - IoT

NTT Data

OPITZ CONSULTING

Oracle

Orange Business Services

Pariveda

Persistent

Praetorian

PTC

Q-Loud

QSC

Qualcomm

Rackspace

Rackspace Technology

Reply

RoviSys

Salesforce

Samsung

SAP

SAS

Schneider Electric

Siemens

Sierra Wireless

Softdel

Software AG

Solstice

solutions direkt (direkt gruppe)

SPIRIT/21

Splunk

Sprint

Stefanini

Storm Reply

Sutherland

Syntax

TCS

Tech Mahindra

Telit

ThingLogix

TietoEVRY Oyj

Trek10

Unisys

Unity

UST

UTC

V2Soft

Valantic

Verizon

Virtusa

Vmware

Vodafone

VVDN

Wipro

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Xoriant

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Do you need any further information?

If you have any questions, please do not hesitate to contact us at isglens@isg-one.com.

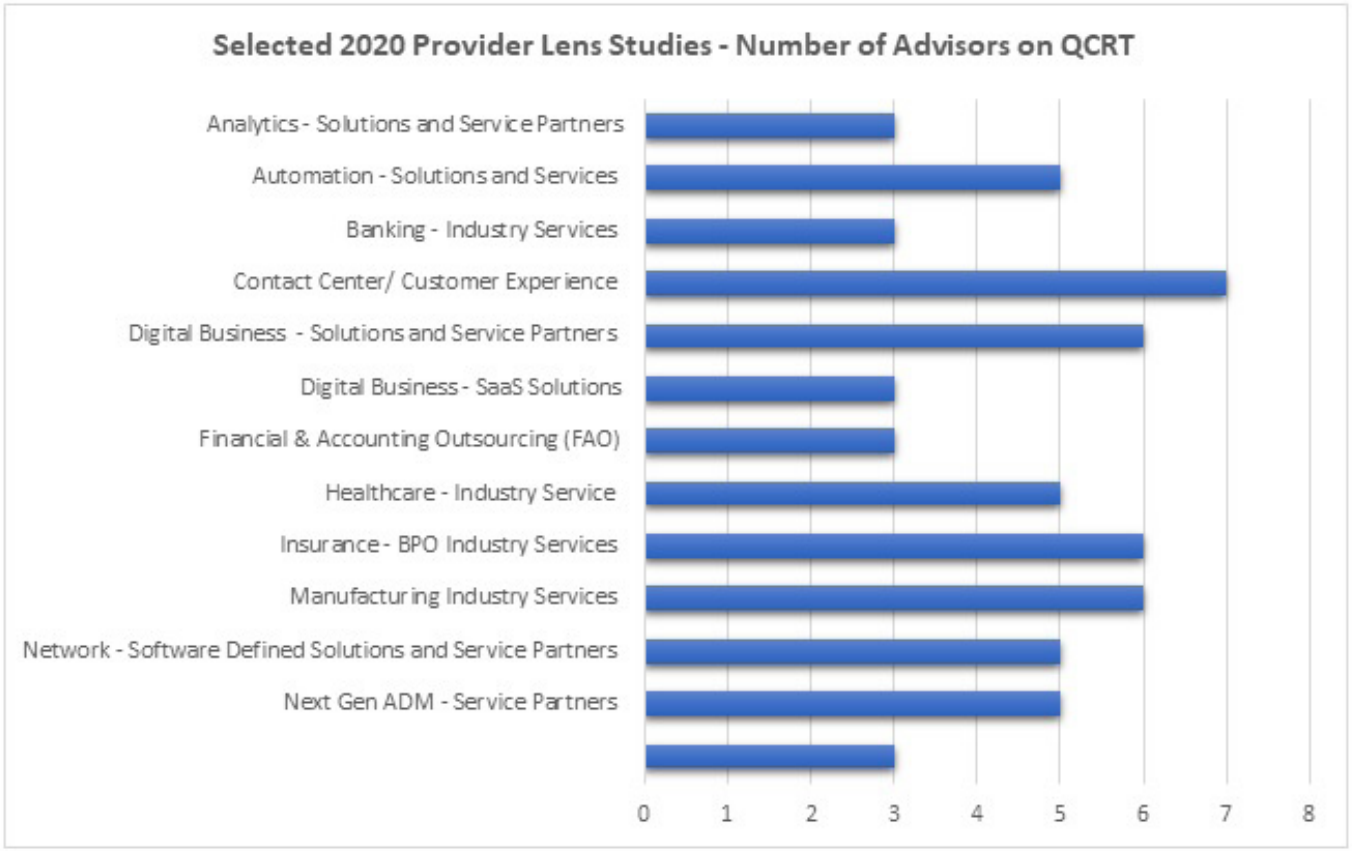
ISG Provider Lens QCRT Program Description

ISG Provider Lens offers market assessments incorporating practitioner insights, reflecting regional focus and independent research. ISG ensures advisor involvement in each study to cover the appropriate market details aligned to the respective service lines/technology trends, service provider presence and enterprise context. In each region, ISG has expert thought leaders and respected advisors who know the provider portfolios and offerings as well as enterprise requirements and market trends. On average, three advisors participate as part of each study's Quality & Consistency Review Team (QCRT). The QCRT ensures each study reflects ISG advisors' experience in the field, which complements the primary and secondary research the analysts conduct. ISG advisors participate in each study as part of the QCRT group and contribute at different levels depending on their availability and expertise.

The QCRT advisors:

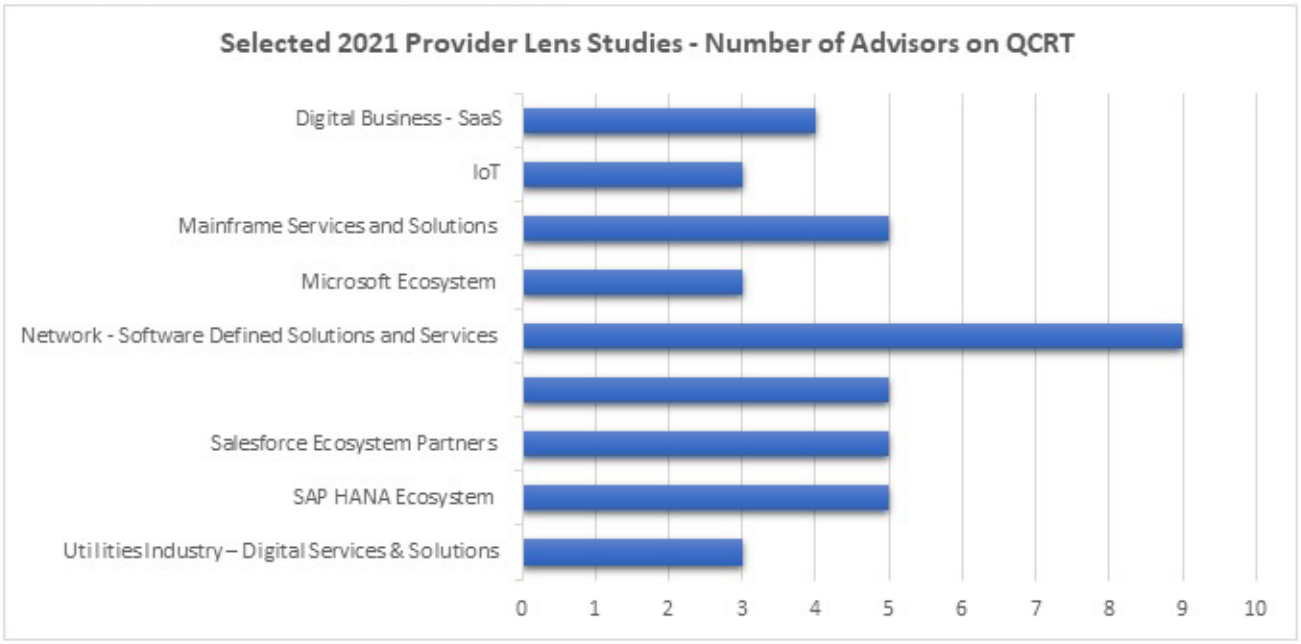
- help define and validate quadrants and questionnaires,
- advise on service providers inclusion, participate in briefing calls,
- give their perspectives on service provider ratings and review report drafts.

In 2020, on average three ISG advisors supported Provider Lens studies.



Source: ISG Research

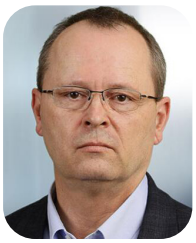
In 2021, studies are enjoying similar involvement.



Source: ISG Research

The ISG Provider Lens QCRT program helps round out the research process, supporting comprehensive research-focused studies.

Quality and Consistency Review Team



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