ISG Provider Lens™

Manufacturing Industry Services

Analyzing product engineering capabilities, from ideation to implementation

Table of Contents 🏠

The Manufacturing Industry Services 2022 study tracks and analyzes the offerings related to product and manufacturing engineering that lead to efficient manufacturing. The study also examines intricacies of product engineering such as design, development and pilot scale manufacturing. The report spans the entire lifecycle of a product design, from whiteboarding and 3D simulation to implementation of robotics, and ISG tends to analyze the major disruptions taking place in the product engineering domain.

The system integrators offer product and manufacturing engineering services in the form of early research, prototyping, product optimization, value engineering based on regulatory changes, cost takeout through the production process and more. This strategic move strengthens providers' capabilities in human-factor design of physical objects and is expected to drive next-generation product engineering that involves the human-machine interface. At present, the providers also offer product transformation and technology refurbishment, delivering new versions of products based on industry requirements and end-user feedback.

The study examines the role of service and solution providers across the product engineering spectrum of manufacturing industry, spanning design capabilities, pilot scale implementations, and IT and OT convergence to aftermarket services. ISG identifies a paradigm shift in foundational technologies with an amalgamation of cross-functional innovations. Service providers strengthen themselves with the advantages of the cloud. The technology plays a major role in connected products in terms of defining digital services and connecting them to edge cloud solutions.
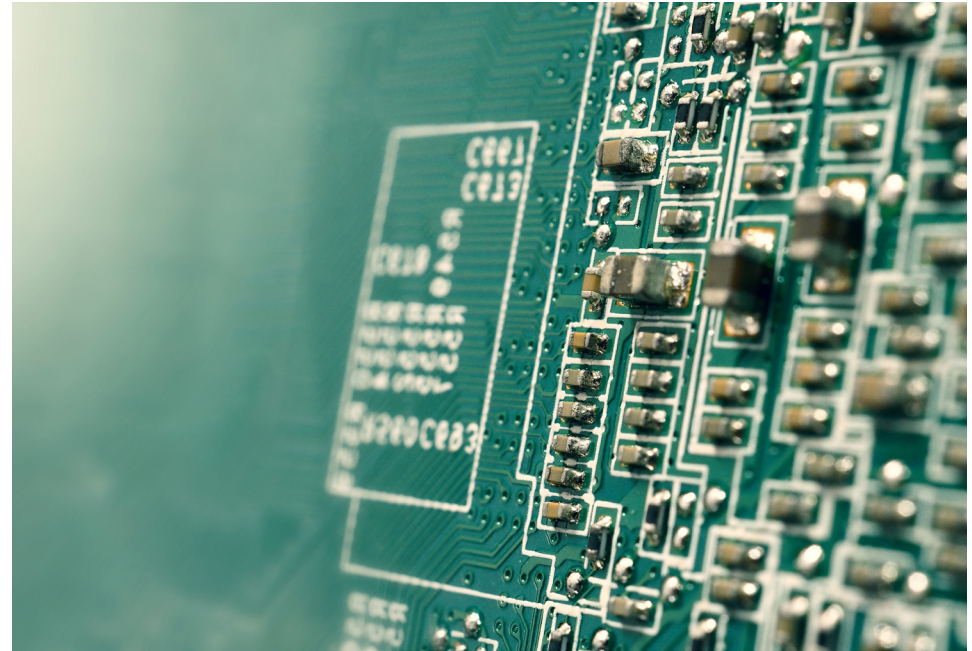
Analysis of the business in terms of new-age technologies such as remote monitoring of the production line (which necessitates moving workloads to the cloud) and providing momentum to IoT, cloud, augmented reality, virtual reality and similar other technologies are areas of focus. Overall, the quadrants analyze the attributes of providers empowering organizations to transform into the digital world and accelerate digital strategy implementation. ISG will also analyze the provider's ability to implement predictive maintenance, covering diagnosis scheduling and development of roadmaps around capabilities in technologies such as 3D printing, augmented reality, virtual reality and other use cases of virtualization in several business landscapes. Additionally, the ability to integrate security in every layer of product and manufacturing engineering with in-house capabilities or partnerships will be analyzed.

Key focus areas for **Manufacturing Industry Services** 2022

Simplified Illustration Source: ISG 2022

Product Engineering - Airlines and Airports

Product Engineering - Automotive Autonomous, Connected, Electric and Shared (ACES)

Product Engineering - Semiconductor and Hi-Tech

Mobility Security Solutions

OT Security Solutions

The ISG Provider Lens™ Manufacturing Industry Services offers the following to business and IT decision makers:

- Transparency on the strengths and weaknesses of relevant providers.

- A differentiated positioning of providers by segments on their competitive strengths and portfolio attractiveness.

- Focus on different markets, including the 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 engagements.

Product Engineering - Airlines and Airports

Definition

The quadrant analyzes service providers and system integrators that provide airlines and airports with product engineering support and services to assist with operations (including check-in and boarding, baggage handling cargo operations, ancillary services and airport retail), airport security, flight and crew operations, and the tracking and monitoring of airline and maintenance, repair and operations (MRO) assets, thus enhancing the passenger experience. Furthermore, ISG tends to assess the service provider's collaboration with leading product companies, aviation alliances and other relevant consortiums.

The quadrant also analyzes the providers' ability to leverage AI, machine learning, robotics, and VR and AR technologies to drive solution development, from ideation to commercialization, catering to new industry use cases.

Eligibility Criteria

1. Ability to offer product engineering support to at least one solution directed toward commercial aviation operations such as check-in and boarding, airport retail, airport security, flight and crew management, tracking and monitoring of airline and MRO assets

2. Demonstrate strong partnerships with product vendors specialized in travel and transportation solutions

3. Showcase execution of digital capabilities and operationalize the relevant function for at least one major airport or airline; providers with expertise in blockchain technologies directed toward transportation and logistics would be given additional credits

Product Engineering - Automotive Autonomous, Connected, Electric and Shared (ACES)

Definition

The quadrant assesses the capabilities of service providers that offer systems engineering and R&D services. It also evaluates service providers that have capabilities in software engineering and embedded systems across the components of the automotive ACES domain. ISG will also examine the role of service providers across the product engineering process, spanning design, development, pilot scale implementation and every aspect of software-defined mobility, including the development of digital cockpits, in-vehicle software, vehicle-to-everything solutions, cloud engineering strategy, UX and service design, mobile applications and connected vehicle platforms for passenger and commercial vehicles.

Considerable focus is on mobility security capabilities and aspects of functional safety. Moreover, ISG tends to analyze providers' proficiencies in hydrogen propulsion concepts. Providers with capabilities in just mechanical and hardware systems are excluded.

Eligibility Criteria

1. Demonstrate product engineering capabilities in at least one component of ACES (that may or may not be a usable end product for passenger and commercial vehicles) that meets an OEM's requirements

2. Showcase software product engineering capabilities in segments such as digital cockpits, navigation, cloud connectivity, AUTOSAR and V2X connectivity

3. Expertise in automotive software development and ability to offer robust software engineering services to help automotive companies fast-track to the future of mobility; providers that have invested in infrastructure development such as labs and centers of excellence to showcase capabilities in domains such as ADAS, sensor fusion, telematics and electric/hydrogen propulsion would be given additional credit

Product Engineering - Semiconductor and Hi-Tech

Definition

The quadrant analyzes the engineering and R&D capabilities of service providers in the mainstream semiconductor manufacturing processes and across front-end-of-the-line (FEOL) and backend-of-the-line (BEOL) subprocesses — from the creation of transistors to the formation of interconnects within a device. ISG analyzes the provider's potential to bring software-defined product differentiation based on the foundational semiconductor engineering capability. ISG will also examine their ability to deliver disruptive use cases such as AI-enabled chips and high-speed networks and enable businesses to unlock the benefits of cloud through collaborations with hyperscalers. A provider's expertise is measured based on its design engineering prowess and quality assurance capabilities.

Some of the major functions include ensuring compatibility in interconnects and the small wiring schemes in devices, which contribute to the resistance-capacitance (RC) delay in semiconductor chips. A service provider is expected to have design capabilities in key subsegments, including digital, analog, high-speed physical interface intellectual property, embedded memory compiler, electronic design automation (EDA) and modeling.

Eligibility Criteria

1. Demonstrate design and/or quality assurance capabilities in the complementary metal oxide semiconductor (CMOS) manufacturing processes, which may or may not be a usable end product for an electronic device vendor to meet an enterprise requirement

2. Services should encompass one or more of the FEOL processes (wafer preparation, isolation, well formation, gate patterning, spacer, extension and source/drain implantation, silicide formation and dual stress liner formation) and BEOL processes (dielectric film deposition, patterning, metal fill and planarization by chemical mechanical polishing)

3. Demonstrate proficiency in integrated circuit (IC) manufacturing or IC fabrication, including materials, processes, integration and lithography engineering, with in-house talent or by engaging contract manufacturers

4. Demonstrate capabilities in assisting manufacturers acquire certifications such as ISO 9001 and ISO 14001

Product Engineering - Semiconductor and Hi-Tech

Eligibility Criteria

5. Specialize in at least one manufacturing process such as wafer preparation, photolithography, etching, cleaning, thin films, ion implantation, planarization, test and assembly

6. Demonstrate experience with advanced technologies such as new materials (high-K/metal gate, or HKMG, and III-V materials or non-copper BEOL metals), new interconnect structures (FinFET/Trigate, nanowires, self-aligned via integration or Cu/air-gap interconnects), new integrations (3D IC, through-silicon via or TSV, or 3D heterogeneous integration), and new lithography technologies (double patterning, extreme ultraviolet, or EUV, lithography and directed self-assembly, or DSA)

Mobility Security Solutions

Definition

This quadrant includes all aspects of solutions and services to protect connected cars and connected aircraft, including passenger jets, commercial vehicles and on- or off-highway vehicles, against cyberattacks. The quadrant also analyzes the capabilities of solution providers to address the challenges of integrating full connectivity into advanced moving platforms with new and ultra-fast communication networks, fast data-based systems, and high-performance computing. Providers with secure-by-design software and hardware development capabilities and those catering to all cross sections of customers such as car manufacturers, Tier-1 suppliers, fleet operators and aftermarket connectivity providers are considered to have a competitive edge.

ISG also considers providers that have capabilities in spoofing protection software and integrating them into GPS. These systems integrate global navigation satellite system (GNSS) security into hardware at the chip or receiver level and offer positioning, navigation and timing (PNT) capabilities.

Eligibility Criteria

1. Demonstrate experience in both cybersecurity and the mobility industry, offering innovative security methods and proven computer networking know-how with a deep understanding of automotive best practices

2. Offer software-only, connected and system-agnostic solutions to detect, protect and mitigate smart spoofing

3. Demonstrate experience in consulting, assessment and execution of mobility security alignments specified by the new regulations that have been launched and mandated (UNECE WP.29 and ISO 21434)

OT Security Solutions

Definition

OT can be defined as the suite of hardware and software that monitors and controls the activities of equipment in a manufacturing environment. OT systems such as industrial control systems for heavy industries, which include manufacturing, transportation and utilities that have been in existence for decades, are traditionally not connected, thereby making them redundant (or obsolete) in the modern, advanced networked infrastructure. The lack of automation in legacy mechanical systems necessitates manual operation of equipment, log collection and monitoring. With the emergence of smart, connected devices, providers have more control over these systems. The growth of machine-to-machine (M2M) technologies and machine learning has led to a radical change in industry dynamics, wherein setups are geared toward autonomy. The

benefits are being realized in the form of preventive maintenance that improves machine longevity. ISG analyzes the security solutions offered by a solution provider to monitor Modbus, Profibus, Ethernet traffic and proprietary traffic and protect OT components such as PLC, human-machine interface (HMI), SCADA software, physical equipment, machine control systems and remote industrial software that are not connected to the external world.

Eligibility Criteria

1. Have offerings in at least one segment of OT security, for example, monitoring and visibility or decoy and deception technologies

2. Demonstrates capabilities in at least few of the functions, including asset discovery, vulnerability management, threat detection, NGFW (next-generation firewall) and zero trust

3. Have a track record of providing seamless security against all kinds of data breaches in the manufacturing campus or networks

4. Ability to integrate complex and emerging technologies, including network technologies, into an overall security solution

5. Demonstrate the capacity to rapidly innovate and stay apace with the latest threats from the rapidly advancing community of cybercriminals

Quadrants By Region

As part of this ISG Provider Lens™ quadrant study, we are introducing the following five quadrants on Manufacturing Industry Services 2022:

Quadrant	Global	U.S.	Europe
Product Engineering - Airlines and Airports		✔	✔
Product Engineering - Automotive Autonomous, Connected, Electric and Shared (ACES)		✔	✔
Product Engineering - Semiconductor and Hi-Tech		✔	✔
Mobility Security Solutions	✔		
OT Security Solutions	✔		

Schedule

The research phase falls in the period between August and September 2022, during which survey, evaluation, analysis and validation will take place. The results will be presented to the media in December 2022.

Milestones	Beginning	End
Survey Launch	August 11, 2022	
Survey Phase	August 11, 2022	September 05, 2022
Sneak Previews	November 2022	
Press Release & Publication	December 2022	

Please refer to the link to view/download the ISG Provider Lens™ 2022 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 crea ting 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 rec eived 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.

ISG Star of Excellence™ – Call for nominations

The Star of Excellence is an independent recognition of excellent service delivery based on the concept of "Voice of the Customer." The Star of Excellence is a program, designed by ISG, to collect client feedback about service providers' success in demonstrating the highest standards of client service excellence and customer centricity.

The global survey is all about services that are associated with IPL studies. In consequence, all ISG Analysts will be continuously provided with information on the customer experience of all relevant service providers. This information comes on top of existing first-hand advisor feedback that IPL leverages in context of its practitioner-led consulting approach.

Providers are invited to nominate their clients to participate. Once the nomination has been submitted, ISG sends out a mail confirmation to both sides. It is self-evident that ISG anonymizes all customer data and does not share it with third parties.

It is our vision that the Star of Excellence will be recognized as the leading industry recognition for client service excellence and serve as the benchmark for measuring client sentiments.

To ensure your selected clients complete the feedback for your nominated engagement please use the Client nomination section on the Star of Excellence website.

We have set up an email where you can direct any questions or provide comments. This email will be checked daily, please allow up to 24 hours for a reply. Here is the email address: ISG.star@isg-one.com

ISG Star of Excellence

Contacts For This Study

Avimanyu
Basu

**Lead Analyst, Global,
U.S. and Europe**

Ridam
Bhattacharjee

Project Manager

Varsha
Sengar

Senior Analyst

ISG Provider Lens Advisors Involvement Program

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 and 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 provider inclusion, participate in briefing calls,

- Give their perspectives on service provider ratings and review report drafts.

ISG Advisors to this study

Christian Decker

Partner & EMEA Lead Smart Manufacturing, EMEA

John Lytle

Director - Manufacturing, U.S.

Invited Companies

If your company is listed on this page or you feel your company should be listed, please contact ISG to ensure we have the correct contact person(s) to actively participate in this research.

* Rated in previous iteration

Accenture	Claroty*	FEV*	Imagination Technologies
AKKA/ModisAlten*	Cognizant*	Firemon*	Indegy/Tenable*
Argus*	CyberX/Microsoft*	Forcepoint	Infosys*
Armis*	Cyient*	Forescout*	Intellias
Atos*	Darktrace*	ForgeRock	ITC Infotech
Attivo Networks*	Dellfer*	Fortinet	Itransition
Autocrypt*	Dragos*	F-Secure	Karamba Security*
AVL	DXC Technology*	GlobalLogic/Hitachi*	Kaspersky*
Axiscades*	EDAG*	Guardknox*	KPIT*
Bayshore Networks*	eInfochips	Happiest Minds*	LTTS*
Bertrandt*	Embitel	HARMAN	Menlo Security
Bosch	ESCRYPT	HCL*	Mindteck*
C2A security*	Expleo*	IAV*	Mobica
Capgemini*	e-Zest	IBM*	Mocana*
Centum	Ferchau*	Ignitarium*	Mphasis*

Invited Companies

If your company is listed on this page or you feel your company should be listed, please contact ISG to ensure we have the correct contact person(s) to actively participate in this research.

* Rated in previous iteration

Ness Digital Engineering

Nozomi Networks*

NTT DATA

OPSWAT

Optiv*

Otorio

Palo Alto Networks

Penta security*

PFP Cyber

Pratum*

QuEST Global*

R Systems*

Radiflow*

Red Balloon Security

Red Balloon Security

Redeem

Regulus Cyber*

Robert Bosch Engineering and Business Solutions

Sasken*

SCADAfence*

Sentryo/Cisco*

Siemens

SIGA OT*

Sigma Software

Smokescreen/Zscaler*

Tata Elxsi*

TCS*

Tech Mahindra*

Trend Micro

Trigent

Upstream*

UST*

Verve

VOLANSYS

VVDN Technologies*

Wipro*

Zensar*

About Our Company & Research

ISG Provider Lens™

The ISG Provider Lens™ Quadrant research series is the only service provider evaluation of its kind to combine empirical, data-driven research and market analysis with the real-world experience and observations of ISG's global advisory team. Enterprises will find a wealth of detailed data and market analysis to help guide their selection of appropriate sourcing partners, while ISG advisors use the reports to validate their own market knowledge and make recommendations to ISG's enterprise clients. The research currently covers providers offering their services across multiple geographies globally.

For more information about ISG Provider Lens research, please visit this webpage.

ISG Research™

ISG Research™ provides subscription research, advisory consulting and executive event services focused on market trends and disruptive technologies driving change in business computing. ISG Research delivers guidance that helps businesses accelerate growth and create more value.

ISG offers research specifically about providers to state and local governments (including counties, cities) as well as higher education institutions. Visit: Public Sector.

For more information about ISG Research subscriptions, please email contact@isg-one.com, call +1.203.454.3900, or visit research.isg-one.com.

ISG

ISG (Information Services Group) (Nasdaq: III) is a leading global technology research and advisory firm. A trusted business partner to more than 800 clients, including more than 75 of the world's top 100 enterprises, 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; 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 digital-ready 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.

ISG Provider Lens™