ISG Provider Lens™

2020

Manufacturing Industry Services 2020

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, Connecticut, 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.

Table of Contents

The Manufacturing industry is in the midst of digital transformation. Competitive parameters are changing as a result of new customer requirements and the resultant trend toward local production.

- **COVID 19 becomes an accelerator for digitalization and local production:** The COVID-19 pandemic has disrupted global production. The need for a global network, efficient logistics and distributed supply chains are not new. Efforts to virtualize production and to move it closer to customers started before BREXIT. The urgency of creating smart local factories has now accelerated.
- **Manufacturers shift from product sales to service provisioning (Product as a Service):** Product lifecycles are constantly decreasing, and, with this, there is a corresponding decline in product loyalty among customers. Services have become the new battleground and manufacturers keep changing modes of operation to optimize business efficiency. In order to succeed, they need more customer insight, software-based service capabilities and the ability to innovate and react quickly to changing customer preferences.
- **Digital engineering services offer great revenue potential:** The current IT-driven developments in automotive — be it the use of hybrid technology, inclusion of infotainment or deployment of electric motors — create new business opportunities. The value share of digital components integrated in the engineering aspects of vehicles is increasing rapidly. Subsequently, the automotive revenue pool will increase and diversify. At the same time, shared mobility solutions will increase the demand for software-driven services.
- **Data analytics provides investment opportunities in key enablers:** Insights for product-as-a-service initiatives and the orchestration of the production environment are central to drive end-user experience and resilience in product development.
- **5G infrastructure is an investment opportunity with high growth potential:** Smart factories are major opportunities for the use of 5G . A 5G network not only promises super-fast connections and more bandwidth than Wi-Fi and 4G LTE, but also better connectivity, low latency and support for thousands of devices in one location — all of which are attractive for manufacturing facilities.

Definition

The “Manufacturing Industry Services 2020“ study tracks and analyzes the offerings around several elements of manufacturing, from the intricacies of 3D simulation to shop floor robotics. Automation plays a significant role here, spreading across components such as manufacturing operations management (MOM) and manufacturing execution systems (MES), as well as capturing process data and storing it in the cloud or inside the new edge.

The study examines the role of service providers across the entire value chain of manufacturing engineering — from virtual layout or simulation of the shop floor, ergonomics for machinery and IT/OT convergence to aftermarket services such as leveraging digital twin to check the condition of machinery while it reaches the wear-out period of the wear curve.

ISG sets out to deliver a comprehensive research program with clear and extensive evaluation criteria, covering the developments and deliverables of service providers and equipment suppliers in this dynamic market. This study accounts for changing market requirements and provides a consistent market overview for the segments, along with concrete decision-making support to help user organizations evaluate and assess the offerings and performance of providers.

The ISG Provider Lens™ study offers IT, Engineering and R&D-decision makers:

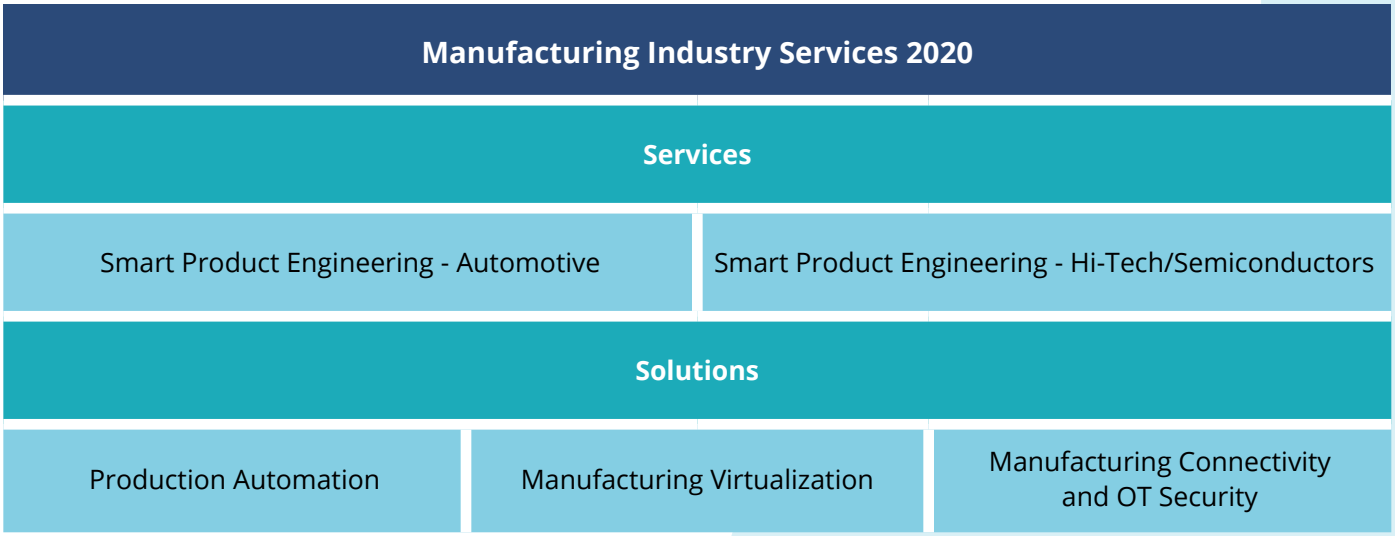
- Transparency on the strengths and weaknesses of relevant providers
- Differentiated positioning of providers by segments.
- Perspective on several markets, including Germany, U.K. and the U.S.

Our study serves as an important decision-making basis for positioning, key relationship 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.

Quadrant Research

As part of this ISG Provider Lens™ quadrant study, we are introducing the following five quadrants under Manufacturing Industry Services 2020.

Simplified illustration



Source: ISG 2020

Smart Product Engineering – Automotive

The quadrant assesses service providers/system integrators' capabilities in systems engineering, including hardware (electrical and mechanical), software and embedded systems along segments such as small series manufacturing, tests and simulations. The automotive smart product engineering process starts after prototype development that covers every aspect of industry-scale manufacturing engineering, including niche techniques such as additive manufacturing. Considerable focus is on the seamless integration of electronics, sensor technology and software systems to drive the concept of autonomous, connected, electric and secured (ACES), aligned with proficiencies in virtual manufacturing, digital manufacturing and lean manufacturing. Lastly, ISG analyzes domain expertise across latest testing methodologies such as noise-vibration-harshness (NVH), virtual vehicle and brake systems, as well as opportunities tapped in the growing market of test equipment design and testing-as-a-service.

Eligibility Criteria:

- An engineering and R&D player should typically be able to execute at least one smart manufacturing process (that may or may not be a usable end product for an automobile) that meets an OEMs requirement.
- A service provider should have development capabilities in at least one automotive segment, namely, body, engine, transmission, suspension, braking systems, powertrain or interiors. Capabilities in advanced technologies such as nanotechnology for the manufacture of lightweight vehicles, fuel-cell or hydrogen powered propulsions to reduce emissions, and new battery chemistries to increase EV sustainability would be awarded additional credits
- A service provider should specialize in at least one aspect of the automotive manufacturing process such as chassis production, electrocoating, surface-finishing, pre-assembly or final assembly.
- A provider should have product development and obsolescence management capabilities.

Smart Product Engineering – Hi-Tech/Semiconductors

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 creation of transistors to the formation of interconnects within a device. A provider's expertise is measured based on its design engineering prowess as well as the quality assurance capabilities. Some of the major functions include ensuring compatibility in interconnects, 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 IP, embedded memory compiler, electronic design automation (EDA) and modelling.

Eligibility Criteria:

- The engineering and R&D market participant should have 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.
- The 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).
- A service provider should be proficient in integrated circuit (IC) manufacturing or IC fabrication, including materials, process, integration, and lithography engineering, with in-house talent or by engaging contract manufacturers. Also, providers with capabilities in helping manufacturers acquire certifications such as ISO-9001 and ISO14001 would be preferred.
- A service provider with specialization in at least one manufacturing process, such as wafer preparation, photolithography, etching, cleaning, thin films, ion implantation, planarization, test and assembly, would be given additional credit.
- Experience with advanced technologies such as new materials (high-K/metal gate (HKMG), III-V materials or non-copper BEOL metals), new interconnect structures (FinFET/Trigate, nanowires, self-aligned via integration or Cu/air-gap interconnects) and new integrations (3D IC, Through-Silicon Via (TSV) or 3D heterogeneous integration) and new lithography technologies (double patterning, extreme ultraviolet (EUV) lithography and directed self-assembly (DSA) would be given additional credit.

Production Automation Solutions

Manufacturing automation solutions bring about automated responses in surveillance and predictive maintenance of the production environment to reduce outage time of all moving, robotics parts. These solutions detect patterns and trends by processing large volumes of structured and unstructured data from multiple sources, including IoT sensors. Production use cases for analytics include optimized use of plant machinery, continuous monitoring and digitally derived improvements in product quality and design, sales forecasts, improved knowledge about customer usage and supply chain optimization. Solutions providers have capabilities to automate plant machinery surveillance, with the objective to reduce production outages.

Eligibility Criteria:

- The ability to capture, integrate, normalize and interpret data collected from very different robotics systems into a cohesive view for surveillance and predictive maintenance decisions.

- Capabilities in the implementation of robots, cobots and AGVs on shop floor to improve production efficiency.
- The ability to automate predictive maintenance decisions such as scheduling diagnosis.
- The ability to detect anomalies before they occur and take action, such as switch production to a different machine.
- Equipped with an adapted commercial licensing model adapted to optimized production shop floors (no user-based licensing).

Manufacturing Virtualization Solutions

This quadrant includes all aspects of non-physical and digital modelling-based manufacturing, including augmented reality/virtual reality (AR/VR) technologies, interactive computer aided designing (CAD) and digital twins. The digital modelling includes all component testing and pre-manufacturing calculations for additive manufacturing. Industrial AR, thus, includes the integration of object recognition, computer graphics, artificial intelligence (AI) and human interaction with sensors and display devices through intuitive interfaces. A digital twin is a digital representation of an object or a process from the real world. Solution providers have tailored manufacturing design toolsets based on powerful algorithms to integrate all of the above-mentioned capabilities into the product engineering and fabrication processes.

Eligibility criteria:

- Digital designing and 3D modelling skills for manufacturing complex objects
- Ability to integrate digital modelling into physical manufacturing processes
- Deep domain knowledge of manufacturing processes in discrete production segments (automotive, hi-tech, healthcare)
- Continual investment and development of digital design capabilities and portfolio.

Manufacturing Connectivity and OT security Solutions

The capability of service providers to deploy near-real-time networks to dynamize factory automation with a local radio network via a licensed spectrum. ISG assesses a provider's proficiency with the new 5G standard that has the potential for real-time communication, driving scenarios such as robotic peer-to-peer communication without latency. The quadrant focuses on solutions for manufacturing connectivity that integrates with wired industrial local area network (LAN) devices, a local management system to monitor and manage a local network infrastructure and connected devices, and a low-latency cloud infrastructure for 5G network functions and industrial applications. On the security side, ISG analyzes the security solutions offered by a service 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 and machine control systems and remote industrial software that are not connected to the external world.

Eligibility criteria:

- Solution providers should have the ability to integrate different technical concepts in a market dominated by a range of specialized startups

- Solution providers should have a track record of successful network and connectivity projects in manufacturing environments
- Solutions providers should have the capacity to innovate and introduce new technology solutions in the manufacturing industry
- Solution providers must have a track record of providing seamless security against all kinds of data breaches in the manufacturing campus or networks
- Solution providers can integrate complex and emerging technologies, including network technologies, into an overall security solution
- Solutions providers should have the capacity to rapidly innovate and stay apace with the latest threats from the rapidly advancing community of cyber criminals

Quadrants by Region

As part of the ISG Provider Lens™ Quadrant Study, we are introducing the following quadrant (market) research on Manufacturing Industry Services 2020 by region:

Quadrants	Global	U.S.	Germany	U.K.
Smart Product Engineering - Automotive	Overview	√	√	√
Smart Product Engineering– Hi-Tech/ Semiconductors	Overview	√	√	√
Production Automation Solutions	Overview	√	√	√
Manufacturing Virtualization Solutions	Overview	√	√	√
Manufacturing Connectivity and OT Security Solutions	Overview	√	√	√

Schedule

The research phase is between August and October 2020. During this period, survey, evaluation, analysis and validation will take place. The results will be presented to the media in November-December 2020.

Milestones	Beginning	End
Launch	August 20, 2020	
Survey Phase	August 20, 2020	September 10, 2020
Sneak Preview	December 2020	
Press release	January 2021	

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!

Please refer to this link to view/download the ISG Provider Lens™ 2020 research agenda.

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 work identified by the 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 to produce ISG Provider Lens™ reports. These decisions will be made based on the level and completeness of 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 here? Then feel free to contact us to ensure your active participation in the research phase.

3i Infotech

ABB

Accenture

AF

AKKA

Alexander Thamm

All for One

Allgeier

Altair

Alten

Alteryx

ANSYS

Apollo Engineering

Arcadis

Aspire Systems

AT&T

ATOS

AVL

Axiscades

AXOOM

Bechtle

Bertrandt

Birlasoft

Blockhead

Bosch

BT

BTA

CANCOM

Capgemini

Capita

Caresoft Global

CBG Consulting

Cegeka

Centric

Cerium Systems

CGI

Cisco

Cognizant

Commonwealth Technology Inc.

Computacenter

Contech

Continental Engineering Services

Cyient

Damovo

Dassault

DataGroup

Dell EMC

Deloitte

Design Concepts

Deutsche Telekom/T-Systems

Device Insight

Dextra Technologies

DXC Technologies

E&Y

Easi

eClerx

EDAG

eInfochips

Embitel

Emergo

eods

EPAM

Ericsson

Esterline

e-Zest

Ferchau

FEV Group

Forcam

Fujitsu

Gefasoft

General Electric

Getronics

GlobalLogic

Happiest Minds

HCL

Hexaware

HPE

Huawei

IAV

IBM

Infogain

Infosys

Inspirisys (CAC)

iTac Software

ITC Infotech

Itransition

Keytree

Kontec

KPIT

KPMG

L&T Technology Services

LTI

Mastek

Materna

MCA Engineering

Microland

Microsoft

Mindteck

Mindtree

MPDV

Mphasis

NaWs

nemetris

NTT Data

Onward Technologies

Orange Business Services

Ordina

Pathpartner

Persistent Systems

Pica8

PTC

PwC

Qlik

Qualcomm

QuEST Global

R Systems

RDM Group

REC Global

Relayr

Reply

Ricardo

Rockwell Automation

Rolta

S Kuchain

SAP

Sasken

Scheer

Schneider Electric

Siemens

Sierra Wireless

Sopra Steria

Stratos

Sweetbridge

Syntax

Tata ELXI

Tata Technologies

TCS

Tech Mahindra

TietoEVRY

Unisys

UST Global

Verizon

Vispiron

VMWare

Volansys

VVDN Technologies

Wipro

Zensar

Contacts for this study

Henning Dransfeld
Lead Analyst — Germany

Avimanyu Basu
Lead Analyst — U.S. and U.K.

Manali Bhaumik
Lead Analyst — Enterprise Context and Global Summary

Sri Harsha Edala
Research Analyst — Enterprise Context and Global Summary

Ravi Ranjan
Global Project Manager

Do you need any further information?

For any questions, please email us at isglens@isg-one.com.