



HP semiconductor manufacturing services



“Infineon is embarking on a global project to upgrade our manufacturing IT systems. We needed a reliable partner to assist us in delivering our next generation CIM system. We chose HP as a partner and they are providing semiconductor knowledgeable consultants to us at our locations in Europe, North America, and Asia.”

Joachim Frey,

Director Manufacturing Execution Systems,
Infineon Technologies AG



Meeting the manufacturing challenge

The competitive landscape in semiconductor manufacturing continues to be challenging, regardless of whether you build products in-house or subcontract to a foundry. Margins are razor-thin and your customers demand shorter cycle times, improved product quality, and better visibility into the supply chain.

The manufacturing environment is complex. Parts are high-value, the production process is long, and the product mix within a fab can be varied. The ability to tolerate processing errors is decreasing, while process technology is continuously advancing. A single error can run into millions of dollars. Work stoppages and capacity under-utilization can quickly turn profits into losses. Capital expenditures are high—the cost of a new 300 mm fab can exceed \$3 billion.

Whether your enterprise is building a “green field” fab, retrofitting a current fab, or adding a production line, you cannot go it alone. Where time-to-market requirements drive implementation times for new fab lines and processes continually lower, you need a partner who is experienced in helping you meet both manufacturing and business objectives on time and within budget. Your choice of a partner is as critical as your choice of personnel, manufacturing processes, and equipment.

The ideal partner is experienced in designing, planning, and implementing a computer integrated manufacturing (CIM) environment and has established partnerships with the providers of key applications such as manufacturing execution systems (MES). Equally important, this partner

must be capable of integrating the CIM environment with applications and information systems across the extended enterprise. Getting these systems in synch helps make the critical information created during the manufacturing process available to improve your enterprise’s competitive edge.

HP as a systems integrator

Given its history of providing world-class manufacturing automation, and IT systems to the semiconductor industry, HP is the right choice for a partner. HP delivers a complete lifecycle of consulting and support services as well as the hardware, software, and network infrastructure for an end-to-end solution that addresses every element of your environment—from your ERP and supply chain management systems to advanced process control, recipe management, and material control on the fab floor. We have strengthened our expertise through alliances with leading technology and applications providers. We also have refined our solutions in our own manufacturing facilities. That work has produced a comprehensive set of best practices that will benefit your operations going forward. And HP has been recognized by Gartner Dataquest as the #1 systems integrator in semiconductor manufacturing.

“Hewlett-Packard was selected based on its position as a leading provider of manufacturing solutions, its past history of success, and its commitment to provide forward looking, state of the art solutions to fundamental manufacturing challenges.”

Jim Casey,
Director of Sort Operations,
Cypress Semiconductor
Corporation

Benefits of a disciplined approach

Implementing a complex manufacturing IT system and integrating it with enterprise-level systems requires a structured program management methodology. After implementation, managing day-to-day operations requires the same high degree of organization. HP has leveraged its engagement process as well as years of experience to support fast system ramp-up and ongoing success.

Faster time to market

In an environment where even a few months' delay can significantly shorten your fab's lifespan and decrease profitability, our experienced consultants bring your information systems online quickly and smoothly integrate them with all relevant components of the value delivery chain.

A single point of contact

Creating and integrating a semiconductor manufacturing information system can consume thousands of person-hours in a multivendor environment. HP can fill the role of prime contractor and coordinate the efforts of a global and diverse team at all stages of the project, providing a single point of contact and accountability.

Continuous, trusted support

HP provides the data center, project management and support skills to help keep your systems functioning at optimum levels. Our ability to call on a network of global resources plus our relationships with skilled local contractors means that we can assist you in selecting and making arrangements for appropriate levels of support and maintenance.

Maximum flexibility and scalability

HP's deep experience in developing and deploying high-availability manufacturing and enterprise IT systems means that your infrastructure will have maximum flexibility. HP Services experts create scalable solutions that anticipate and rapidly adapt to changes in the market and the manufacturing process.

Decreased risk

Risk abounds in the semiconductor industry—whether in the manufacturing process itself or in building production facilities. When you partner with an experienced company like HP, you significantly decrease that risk for the duration of the project lifecycle.

Improved ROI

By improving asset utilization, reducing product cycle time, improving yields, modifying processes, bringing up new lines without interrupting production or impacting delivery, and providing relevant information throughout the supply chain, you decrease the time your company needs to recover the investments being made.

Increased business value

Optimizing manufacturing information assets is an absolute requirement for semiconductor manufacturers. HP understands the need to align IT capabilities with business requirements. Our adaptive IT infrastructure initiative helps drive solutions that make the right information available at the right time and place.



Delivering the essential services

The HP Global Program Office and methodology were developed to provide a model approach to deliver all HP projects. It includes key deliverables and promotes the use of best practices that increase a project's probability of success. The HP methodology provides the planning expertise necessary to integrate all information systems from fab floor to customer. The HP process includes traditional activities such as requirements definition, analysis, design, development, implementation, and ongoing support. HP experts incorporate quality assurance, configuration management, and measurement methodologies into every project for maximum management visibility and control.

Service delivery comprises four essential stages:

Planning

Through research, interview techniques, and benchmarking, HP Services experts examine your current operations and deliver a gap analysis of information needs in the context of your manufacturing and business objectives. Then, the HP team tailors its program and project planning to your specific requirements—regardless of whether you are building a new fab, expanding an existing one, or upgrading your present information systems.

Design

Following the planning stage, HP solution architects further define your information requirements as they support your objectives for effective manufacturing and business decision-making. They then create a technology architecture that includes a supply chain specification,

a manufacturing-floor-level database, software for equipment and cell control, and a networked infrastructure that ties together all the functions, users, and levels. Our consultants develop functional specifications that characterize linkages and intended operations at each level and also for the system as a whole. Finally, they design acceptance test specifications to ensure your satisfaction at project delivery.

Implementation

Implementation of the IT environment involves a number of key activities:

• Software development

HP consultants create the links that connect new or non-compatible standalone applications into an integrated framework, as well as develop new applications and a common graphical user interface (GUI) that provides uniform access to applications and data at all levels. All software development activities follow industry-accepted methodologies.

• Systems integration

Our experts integrate network hardware and software systems that perform essential functions at several levels. At the equipment automation/control level, integration efforts include the equipment manager, equipment server, and microstation controllers, as well as process and metrology equipment. At the area/cell level, short-term dispatching, automatic data collection, statistical process control, alarms management, reticle tracking, recipe management, lot reservation, material control, and equipment and process displays are all integrated. Finally, at the fab level, the MES engine can be integrated with scheduling, maintenance, engineering data collection, yield analysis, and enterprise systems such as enterprise resource planning (ERP), demand chain, supply chain, and product data management solutions.

HP is the right choice for a partner. HP delivers a complete lifecycle of consulting and support services as well as the hardware, software, and network infrastructure for an end-to-end solution that addresses every element of your environment.

- **Quality assurance and testing**

HP develops the test systems that simulate individual applications and total fab operation. These simulations assess area interconnectivity, application interoperability, and user access.

In addition, at every stage of the implementation process HP provides complete user documentation to enable your IT and technical personnel to maintain the system and add modules as necessary. HP trains personnel in CIM and supply chain management applications and in specialized functions at each level.

Mission-critical management/support

After personnel are trained and the system is deployed, HP Services experts continue to meet your IT needs. HP offers transition services to address the operational and organizational issues that often arise with newly deployed systems.

HP consultants are available to monitor performance, tune your system, and update your IT architecture with additional functionality, replacement modules, and the latest releases of critical software.

HP can operate and manage the complete IT (servers, network, security, etc.) and application environment for your fab.

As with the other stages of service delivery, our HP maintenance and support services focus on your long- and short-term goals and opportunities, cost control, and maximizing your ROI.

Partners

HP solutions are built on state-of-the-art technologies, processes, and applications. As part of the HP Partner Enablement Program (PEP), our offerings comprise HP intellectual property, coupled with offerings from our best-in-breed ISV and SI partners. PEP provides a vehicle for HP to share our world-class thought leadership and best practices as a manufacturing practitioner. HP partners include the leaders in enterprise computing, MES, and supply chain management, such as Adexa, Applied Materials, Brooks Automation, Microsoft®, Oracle®, PTC, and SAP.

A complete set of technologies

Systems

HP offers the industry's most complete portfolio of computing products—from innovative handheld computers such as the wireless-enabled HP iPAQ PDA to powerful multiprocessor and clustered systems for mission-critical operation.

High availability

HP is the world's leading supplier of 24 x 7 solutions. HP business-critical systems include servers running the HP-UX, Tru64 UNIX®, and OpenVMS operating environments; HP NonStop servers; and servers that run Linux, HP-UX, and Windows®.

Networking

HP ProCurve products offer advanced networking solutions at all organizational levels. HP ProCurve networks support voice/data/video capability over Gigabit Ethernet, FDDI, frame relay, and ATM links, plus cable and wireless connections. Internet-based services add value through support for e-commerce, conferencing, publishing, e-mail and messaging, directories, and customer care.

Storage

HP leads in high-capacity, high-reliability storage solutions ranging from single-user, multi-gigabyte subsystems to modular redundant array of inexpensive disks (RAID) and optical jukebox systems.

Mobile solutions

Wireless-enabled solutions add flexibility and cost-effectiveness to sophisticated information systems of all types. In the manufacturing environment, for example, HP has developed a fab application using the iPAQ, which untethers operators from expensive dedicated user stations.



Why HP?

Integrating a complex manufacturing information system with your enterprise systems requires the assistance of a trusted, experienced partner. If you already use HP systems to run your manufacturing applications, you understand HP's reputation for delivering reliability, innovation, and value. You have learned that in a tough, competitive environment, you can count on HP for the innovation and support that maintains your competitive edge.

For over 25 years, HP has focused on providing high-quality semiconductor manufacturing IT solutions in multivendor environments. Our integration services are designed to streamline every aspect of your operations and increase your return on investment. The HP Services team is available to work with you 24 x 7 from over 500 locations around the world. We strive to support your success, because we view it as our own.

For more information

If you are interested in more information about how HP Services can help in planning, implementing, and supporting your manufacturing information systems, visit www.hp.com/hps/manufacturing/ma_electronics.html or contact us at hightech.solutions@hp.com



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