ARC VIEW

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Tata Consultancy Services Delivers Value with Information, Expertise, and Services for Manufacturers

By Greg Gorbach

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Summary

One of the biggest trends developing in manufacturing is using information and information technologies to become more efficient, responsive, and agile in an increasingly demanding environment. Sometimes, this takes the form of analytics driven by Big Data. Sometimes, it is a new application or a technology for simulation or visualization. But in other cases, the needed information lies with third-party experts who make it available as a service.

Manufacturers that struggle to keep all parts of their manufacturing engineering organization operating at the high levels of performance required in today's increasingly demanding environment often turn to third parties for information, expertise, and services. This ARC View lays out the arguments for considering this approach.

Tata Consultancy Services recently briefed ARC Advisory Group about its Manufacturing Engineering Services. The company highlighted its demonstrated capabilities for global manufacturers and its integrated manufacturing process optimization practices, processes, and tools for clients that might not have the breadth of expertise needed to keep up in today's demanding, fast-paced, dynamic environment.

Manufacturers Have a Lot on Their Hands

Aerospace, automotive, and other discrete manufacturers execute an array of business processes as their products move from the planning stage through first article inspection (FAI). These range from process planning, manufacturing process data management, and factory layout and resource planning in the planning phase; to NC programming optimization and

production data management in the manufacturing phase; to statistical process control and in-process inspection in quality and assembly.

The conventional approach has been for the manufacturer to staff, support, and provide the necessary IT resources with manufacturing domain experience required for each activity.

Increasing External Pressures Impact Product and Production Requirements

A number of marketplace pressures drive manufacturers to perform better in every aspect of their business. These include increasing regulations, the need to be environmentally responsible, global competition in both emerging and established markets, quality and traceability requirements, shrinking product lifecycles, and increasingly demanding customers. Manufacturers can't afford to have weak links in the design-to-delivery value chain. They not only need excellent planners, designers, engineers, coders, testers, inspectors, and technicians; they also need an integrated view of processes, tools, product, etc. Given today's mounting pressures, some manufacturers find it difficult to excel in every activity and process. This calls for rethinking the current methods for manufacturing, process planning, and execution.

Bring in the Professionals

It is important that the manufacturers handle these challenges through a structured approach in which the information is built into the manufacturing process planning. It is often possible to identify specific initiatives or programs for a third party to tackle, often with surprising results. Yes, manufacturers can benefit by, in effect, adding additional headcount. But the real benefit may lie elsewhere. A firm with experience providing manufacturing engineering services – such as Tata Consultancy Services – is likely to have the expertise to review factory cost models, manufacturing IT and future manufacturing readiness, quality standards, capacity planning and dynamic scheduling, and a host of other areas. Based on its knowledge of specific industry practices and expertise with software tools, the services firm can take on specific programs and, in many cases, deliver unexpectedly good results.

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In one example involving TCS, a *throughput simulation initiative* allowed an engine manufacturer to increase production by 150 percent from pre-production line throughput without additional resources, with plans to further increase output. At the same manufacturer, a cost-reduction initiative reviewed 25 major assemblies and over 250 parts. The critical analysis of parts and assemblies – which considered various types of castings, forgings, machined parts, sheet metal, and welded assemblies – yielded a significant year-over-year cost reduction. Other programs reduced cycle time, reduced assembly line turn backs over 40 percent, and reduced the number of CAM applications by 80 percent. In total, this manufacturer realized several million dollars in annual savings through these manufacturing engineering services.

In another example, a *reassurance of quality initiative* enabled a global engineering and manufacturing OEM to align the quality across its supply chain to its own level. This was enabled by capturing the OEM's manufacturing engineering process knowledge in process templates, work instructions, and technical instructions. This included understanding the infrastructure and process capability across the supply chain, capturing key design characteristics, and controlling the process. In addition, a PFMEA mistake-proofing analysis was conducted, which served as the basis to further standardize the process. The standardized processes are disseminated and effectively managed using a technology platform in a centralized environment. By employing this "first time right" approach, the cost of quality is reduced.

The company's holistic view of manufacturing engineering encompasses manufacturing process solutions and services, tool design services, numerical technology solutions and services, and digital manufacturing solutions. These can help improve throughput, process performance, quality, decision making, productivity, materials management, cycle time, cost, and the like. Companies such as Rolls-Royce, Cummins, Owens Corning and other manufacturing companies have benefited by leveraging TCS Manufacturing Solutions.

One of the reasons TCS is able to achieve results like these is that it actively builds and maintains resources to support specific programs, initiatives, and customer engagements. These include things such as providing integrated manufacturing process documents, templates and checklists (with inputs on detailed processes, process parameters, manufacturing tools, process controls, and tools usage) for developing a master process plan; a kinematics coordinate transformation matrix for numerical control; and a digital manufacturing lab that lets customers build competency in agile manufacturing techniques or experience system "proofs of concept" for new projects. Another is the company's holistic

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Information-Driven Manufacturing

The opportunity to take advantage of available outside engineering expertise to improve manufacturing performance in concrete ways and in multiple dimensions can help manufacturers move forward on their respective paths to information-driven manufacturing. By using this service for specific, targeted improvement programs, manufacturers can measure and assess the benefits received. By engaging a company like Tata Consultancy Services to do a higher level analysis and proposal, significant unanticipated improvement opportunities may be uncovered.

Of course, utilizing outsourced services, rather than a company's own internal engineering resources, can sometimes make it more difficult to expand and improve existing manufacturing capabilities and current capabilities may even wither. In addition, some companies will not wish to engage these services because of real or perceived fears of loss of control of intellectual property.

But given the priority to adapt a company's manufacturing environment to meet current information challenges, manufacturers should consider utilizing manufacturing engineering services from companies such as Tata Consultancy Services.

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