



Is Your EMS Provider Effectively Mitigating Risks in Your Project?

In today's economy, whether or not a project achieves total cost goals is often more a factor of a contractor's ability to mitigate risk than a factor of manufacturing capabilities alone. The largest cost overruns typically come from unanticipated issues such as excess inventory, missed deliveries, quality issues or product obsolescence.

In the most cost effective relationships, the electronics manufacturing services (EMS) provider operates not only as an extension of its customers' manufacturing operation in terms of meeting quality and delivery goals, but also becomes the expert in optimizing efficiency throughout the product realization process. This often involves focus on internal contractor operations, supply chain and customers' design, forecasting and ordering processes.

Firstronic, a Michigan-headquartered electronics manufacturing services (EMS) provider has developed strong systems to optimize the product realization process. Program management, supply chain relationships and disciplines such as Lean manufacturing, all play a role in how efficiently project requirements and challenges are addressed. However, the most significant element in Firstronic's business model is its internally-developed management information system called ProManage. Designed by operations personnel with over two decades of EMS experience, the system works in tandem with the Company's MRP system to manage processes from new product launch through end-of-life.

Delivering the Right Solution

One challenge for EMS providers is developing processes that work efficiently, but can be flexibly tailored to varying customer requirements and changes in each customer's supply chain. This is most evident in products with a configure-to-order (CTO) requirement and/or highly variable demand. In these situations there are several areas of key focus:

- Ensuring designs are manufacturable and optimized for CTO
- Developing a forecast sufficient to plan for material requirements
- Setting up a supply chain willing to support minimized inventory but fast response to changes in demand
- Developing a manufacturing process which handles variations in demand effectively
- Establishing an efficiently-sized finished goods kanban to support unanticipated demand.

In a perfect world, establishing these systems is a relatively simple exercise. However, in a volatile economic environment, variations are much harder to predict. Visibility into project variables becomes critical. Management judgment is also a key element.

For example, earlier in the year, one of Firstronic's customers was launching a new product. Their marketing department quadrupled the demand from 50K EAU to 200K and then pulled 90K in Q1. Initially, they wanted all the material to be purchased immediately due to materials allocation concerns. The customer had a historical pattern of large ramps, followed by decreases in orders once demand was clearly established. Firstronic's materials department also saw that the material availability situation was improving, which would likely drive lead-times and pricing down over time. Program management recommended placing orders to cover 35K with adjustments as demand and material allocation trends were better understood. Over the first few months, it became obvious that typical demand was in the

range of 8K per month. Had Firstronics' team gone with the customer's original request, there would have been significant excess inventory and concomitant non-value added costs, including broker premiums to secure the initial volume requirement.

The example above included information sharing on both sides. The contractor provided open-book pricing so the customer was fully aware of the costs of various options. The ProManage system tracked all activities in the project including production validation lessons learned, engineering change notice (ECN) status, projected sales and inventory, shortages/allocated items, quality, on-time delivery performance and open issues. The ProManage system emails status reports and assigns tasks to relevant team members. The new product launch module tracked not only Firstronic's standard checklist of project requirement milestones, but also the customer's specific requirements. The result was a shortened launch cycle, real-time visibility into project issues and detailed recordkeeping of all activities performed during new product introduction and the ramp to volume production.

The Supply Chain

The supply chain is another important element of the equation in terms of both minimizing liability and in helping to reduce overall cost. Firstronic leverages its supply base expertise as part of design for manufacturability/testability (DFM/DFT) recommendation development. PCB fabricators may provide input on optimum layouts for boards and test fixture suppliers may recommend on the best layout for test coverage. Suppliers also proactively provide updates on component lifecycle trends. This information is added to the overall recommendations Firstronic's team makes in its new product introduction (NPI) process.

To minimize liability yet support variable demand, both raw materials and finished goods inventory kanbans are established. Suppliers agree to a bonded inventory based on each customer's forecast and likely variations in demand. A finished goods kanban is also in place and is normally sized to cover two weeks of demand. Firstronic builds to forecast and pulls on demand. In the event demand changes radically, forecasts and bonds are revised.

Flexibility on the Production Floor

Production equipment, floor layout and personnel cross-training contribute to maximized flexibility at minimal cost. Firstronic utilizes a Lean manufacturing strategy. Key principles include:

- Select equipment that facilitates minimized setup and changeover time
- Produce entire product families with a single setup
- Schedule smaller batches and work toward minimal work-in-process (WIP)
- Focus on high yield to drive high throughput
- Fixture to enable a variety of panels to be processed and scanned through the wave solder and reflow processes.

As an example, Firstronic utilizes a dual-pot wave solder machine. Assemblies carry an RFID tag which determines its profile in the wave. Leaded and unleaded assemblies can be processed simultaneously because the system matches the pot used to the RFID tag information. This eliminates the need for multiple changeovers or multiple machines.

Information Systems

As mentioned earlier, real-time information access is another area that is key to mitigating risk. Most EMS facilities manage 20-30 customers simultaneously. Most ERP systems are designed to provide visibility into the activities taking place as production inputs are transformed to finished goods outputs,

but typically people in various departments are driving these processes. In short, EMS is an environment that is best described as controlled chaos. Program managers and a matrix organization business model help keep this chaotic environment in check, but often the program manager's ability to anticipate and manage issues is the deciding factor in overall program performance. Good program managers run efficient programs and less skilled program managers often experience unanticipated problems.

In Firstronic's model, the program manager serves as the central point of contact in terms of information flow with the customer. However, the ProManage system automates many of the day-to-day tasks and monitoring activities that otherwise consume a large share of program management time. Any member of the team can log on to the system and find out exactly what open action items they have on any project 24/7. Team members are emailed as new tasks are assigned and the system is preprogrammed in each of the processes it manages to assign standard tasks as the project progresses. The program manager has the time to better evaluate project trends and look at longer term project issues, instead of getting bogged down in day-to-day tactical tasks.

Information loaded in the engineering database aligns with purchasing and demand planning to ensure materials are purchased and product is built to current revisions. The program manager is able to easily discuss critical issues with customers including:

- Demand vs. forecast trends
- Minimum buy liability and excess inventory generated by engineering changes or end of project
- Part change notices (PCNs) indicating potential obsolescence issues
- Market-driven cost variation trends.

The earlier an issue can be identified, the more options are available for dealing with it and the faster it can be resolved. Fast resolution usually translates to lower cost.

Teaming in Risk Mitigation

As the examples above indicate, mitigating risk is a combination of good processes, robust communication, trust and teamwork. In auditing potential EMS partners, it is important to evaluate softer skills such as program team expertise and judgment relative to managing projects of similar scope. Other areas to evaluate closely are production floor layout and processes used to eliminate bottlenecks driven by variations in demand. The robustness of information systems in capturing key information and migrating it to the people who need it for appropriate decision making is also important. Ultimately, contractors who are best at mitigating risks have systems and processes that make issues visible in real-time and teams who resolve those issues rapidly.

Firstronic LLC (www.firstronic.com) provides advanced electronics manufacturing services and optimized supply chain solutions for the electronics industry. Headquartered in Grand Rapids, MI, Firstronic has a 35,000 square foot facility, state-of-the-art equipment and a seasoned management team with an average tenure of 20 years. For more information, contact: info@firstronic.com.