

A photograph of a man with a beard and glasses, wearing a blue lab coat, working on a green printed circuit board (PCB) in a laboratory or manufacturing setting. He is holding a small red component in his left hand and using a tool on the board with his right hand. The background shows various lab equipment, including a pipette and a rack with tubes. The image is framed by a diagonal split between dark blue and teal colors.

MARKET DYNAMICS FACING OEM'S WITH LARGE PORTFOLIOS OF ONGOING SMALL BATCHES



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Many Original Equipment Manufacturers (OEM's) find themselves managing a complex set of challenges that are primarily the result of the small batch size of their large portfolio of custom electronic assemblies. These burdens can be expensive and timeconsuming, especially as the scope of their product set grows. They often frustrate the OEM buyer and lead them to believe they have few options and little leverage in the contract manufacturing (CM) marketplace. The frequent outcomes are high cost, high inventory levels, and/or poor delivery service... or the suboptimal decision to assemble their electronics inhouse.

OEM-CM MARKETPLACE DYNAMICS

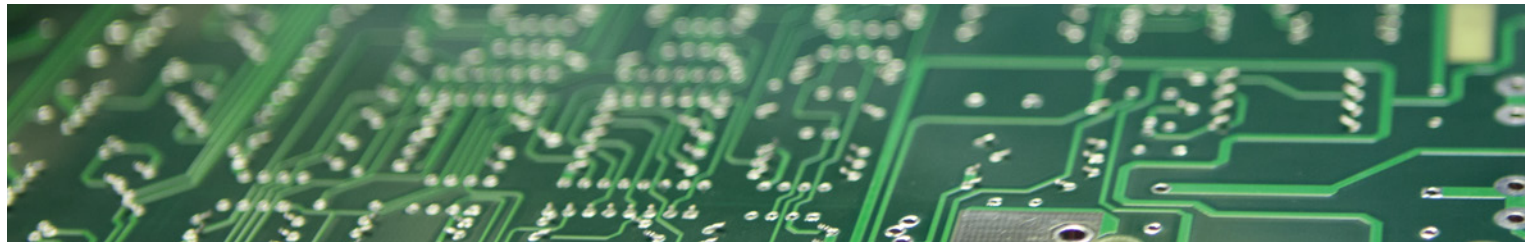
Several key marketplace elements work against the OEM buyer of a Large Portfolio of Ongoing Small Batches (LPOSB), namely:

- Most CM's are much less efficient when running a small batch vs. a large one. They must slow down their highspeed equipment to accommodate small runs – causing them to lose both capacity and profit margin.
- When traditional CM's do small batch work, “overhead costs per dollar of shipped product” are usually higher than those of large batches, making them a suspected resource drain in the areas of sales, marketing, supervision, and orderprocessing.
- The larger the production batch, the higher the priority it usually receives in the CM's schedule.
- When LPOSB buyers introduce a new product line, they typically launch multiple product variations at once, all in small batches. This exacerbates the challenges above, further burdening the traditional CM.
- Rarely does an OEM outgrow its reliance on a large portfolio of small batches – it is in their DNA. They readily add assemblies to their mix as a way of differentiating themselves from their “offtheshelf” type competitors. This matters because many CM's hope that the OEM's batch sizes will grow over time, the product lines will simplify, and the chances of a more stable forecast will improve. When this hope goes unrealized, the relationship may turn sour – and/or expensive.
- CM's are hesitant to “just say no” to business, even if said business really doesn't fit their corporate model. Instead, after landing this recurring small batch work, they subtly discourage business through price increases and/or reduced service priority.

To explain the perspective of the typical LPOSB buyer, consider the following chart.

OEM's with Large Portfolios of Ongoing Small Batches (LPOSB)

LPOSB Buyers often Desire:	LPOSB Buyers often Have:	LPOSB Buyers often Lack:	LPOSB Buyers often Face:
Rapid build & ship service for every assembly in the portfolio	A reasonable approximation of their annual spend	Visibility of unit demand by assembly	Pressure to reduce the magnitude and complexity of their product lines
To hold inventory levels as low as possible	Plenty of CM's vying for their attention	Visibility of timing demand by assembly	Pressure to grow individual assemblies into more "reasonably" sized (larger) batches
To reduce purchase prices over time	Piles of expensive residual inventory (obsolete parts & assemblies)	Complete assembly documentation, especially if they've been building products in-house	Poor service on their small batches when their CM's get busy
To add new products and remove old products at will	A history of mutually disappointing CM relationships	Predictability of component obsolescence	The decision to save unit cost by buying in larger batches, while risking more obsolete inventory
To move products between CM's at will - with full transparency and CM support	Some portion of their portfolio suitable for large batches	Internal resources to resolve component availability problems	The typical "all or nothing" approach offered by most CM's
The flexibility to change production schedules quickly and often	Multiple high-priority initiatives going on, few of which are lucrative for their CM	The ability to make long term commitments and contracts	Exhaustion.



DIVERGENT EXPECTATIONS

OEM's with large portfolios of ongoing small batches encounter a fundamental divergence between their needs and the traditional CM's business model. This type of OEM bases its growth strategy on a continually expanding product mix that follows market opportunities in a very dynamic and often reactive way. Ongoing customization of their product line(s) is a key approach – which often leads to **more** product diversity and even **smaller** batch sizes over time. Many of these assemblies will have a naturally short lifecycle. Many others will be produced infrequently over many years. A few exceptional assemblies may reach medium or high volumes for some period of time.

Meanwhile, from the traditional CM's perspective, this scenario can be a living nightmare. Every new small batch assembly generates the same amount of overhead cost as large batch ones do, so this customer consumes far more resources as a percent of the total than others at a similar spending level.

Digging deeper, we find that the electronic industry's **conventional wisdom** is that CM's should carry no more than 10 - 12 active customers at any time; the converse is that OEM's are encouraged to **represent around 10 - 15%** of the total volume of their CM partner so as to wield enough leverage and influence. Both parties struggle to find this right balance because of the continuing demand variability inherent in the recurring small batch world.

The bottom line is that the success formula for the LPOSB OEM is at crosspurposes with that of the traditional CM. In the headlong pursuit of cost savings and growth, every day – worldwide – both small batch OEM's and traditional CM's try to convince themselves that this core misalignment of expectations can be overcome in their case. But the predictable headaches on both sides eventually emerge.

OPTIONS FOR RESOLUTION

When the fundamental misfit between the business models of the LPOSB OEM and traditional CM becomes visible, there are many ways of handling it.



OPTION 1: BOTH THE OEM AND CM JUST LIVE WITH IT

Characterized by: Business as usual.

THIS SITUATION IS VERY COMMON, ESPECIALLY WHERE:

- The business relationship has grown over a long period of time.
- The LPOSB OEM has little capability or interest to build products inhouse.
- The CM possesses undocumented product knowledge that would be forfeited in a move to another CM.
- Significant accumulated tooling and/or component inventory costs would need to be surrendered.
- The loss of the business (despite the hassles) represents a major perceived blow to the health of the CM. In other words, the OEM customer is considered “too big to lose.”

TYPICAL CONSEQUENCES:

- Perennial management frustration at both partners.
- Tactical execution issues are costly but have become routine.
- Commission-based CM salesperson fights to keep the account.
- Employee turnover at the CM often causes quality problems for the OEM.
- Maalox and Excedrin stock prices climb.

OPTION 2: FORCE A BETTER FIT

Characterized by: CM's economic wellbeing drives decision making.

THIS SITUATION IS ALSO COMMON, ESPECIALLY WHERE:

- CM management changes (organically or through acquisition).
- A fresh analysis on the total costs to service the LPOSB OEM account reveals troubling information.

TYPICAL CONSEQUENCES:

- CM decides it can no longer subsidize the hidden costs inherent in the ongoing small batch business.
- CM selectively raises prices on those assemblies with the highest total cost (considering inventory support, tooling, overhead consumption, capacity loss, changeover difficulty, etc.)
- CM imposes new sales order restrictions such as batch size minimums, constricting blanket order rules, cash policies (terms, etc.).
- OEM feels the squeeze, especially if it cannot pass along price increases to the end user marketplace.



OPTION 3: OEM ENDS THE RELATIONSHIP

Characterized by: OEM decides to exit the relationship and move the business to a new traditional CM.

THIS SITUATION, WHILE NOT UNCOMMON, CAN BE PAINFUL AND EXPENSIVE.

The OEM often begins outside the CM's knowledge due to concern over service disruption. The announcement of a supplier change is usually a surprise to the CM and therefore difficult.

TYPICAL CONSEQUENCES:

- The OEM carries a significant risk of “dropped balls” during the transition.
- Documentation inaccuracies get passed on to the incoming CM.
- The OEM and the outgoing CM must settle open orders, timing, accumulated inventory, and other contract-related issues. This can often be tense and expensive for both partners, resulting in significant cash demands.
- The incoming CM usually bends over backwards to accommodate their new OEM customer with aggressive pricing, stocking inventory, and challenging delivery promises.
- Post-transition, the new CM begins to experience the same core dynamics that led to relationship difficulties with the previous CM.
- Eventually the misalignment of business models emerges and the cycle of mutual disappointment repeats.

OPTION 4: TRADITIONAL CM ENDS THE RELATIONSHIP

Characterized by: CM decides to exit the relationship by informing the LPOSB OEM of an exit date.

THIS SITUATION IS BECOMING MORE COMMON as traditional CM's get more selective and cost/profit-driven. CM managers focus on their particular strengths and growth strategies; they are less likely today to serve customers that fall outside of that definition. Few CM's are designed to thrive with large portfolios of ongoing small batches.

TYPICAL CONSEQUENCES:

- The OEM scrambles to find another qualified CM to take their ongoing small batch work – within the deadline imposed by the CM.
- Risks associated with said scrambling include:
 - Paying higher unit costs to assure supply.
 - Committing to a new CM under an abbreviated qualifications study.
 - Agreeing to a large contract and to take product on a fixed schedule.
 - Choosing the wrong long term partner out of haste.
- The CM is often left with little leverage to negotiate settlement of parts inventory and other open contract issues.
- The CM loses the revenue of this customer (while often increasing its profitability and regaining proportionally more capacity).
- Depending upon how much notice and cooperation is given during the OEM's exit, the CM's reputation in the marketplace may suffer.



OPTION 5: OEM BRINGS IT IN-HOUSE

Characterized by: The OEM comes to the (often reluctant) conclusion that they must build their assemblies themselves in order to reliably get their small batch needs met.

THIS SITUATION IS UNUSUAL BUT NOT UNKNOWN.

The LPOSB OEM is rarely in a position to set aside the capital funds, space, and talent to develop this capability; the batch sizes and overall volume of the work is unlikely to provide an attractive return on investment (ROI).

TYPICAL CONSEQUENCES:

- This option takes more time than any other (often months or years) plus significant capital expenditure.
- The electronic assembly business was originally outsourced for a reason, typically ongoing operations cost, noncore expertise, or future investments needed – perhaps all three. These issues must now again be overcome.
- Developing the discipline and expertise to handle small batches exclusively is no small feat. The start-and-stop nature of the business creates many inefficiencies. Challenges include:
 - Staffing through peaks and valleys
 - Training & retention
 - Perpetual product changeovers
 - Purchasing and inventory planning (components, WIP, finished goods)
 - Cost tracking by production job
 - Quality control, reporting, etc.
- Assuming all of these issues can be conquered, building one's own electronics can be a reasonable short term solution. Staying current and capable of the latest technological developments will always be a consideration.



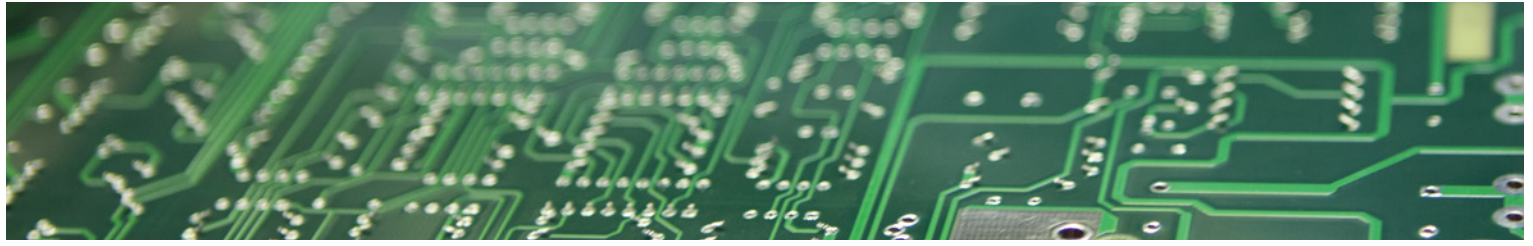
OPTION 6: ALIGN WITH A CM THAT IS DESIGNED FOR SMALL BATCHES EXCLUSIVELY

Characterized by: The LPOSB OEM ends its practice of working with a traditional CM who is motivated by higher batch sizes and total volumes. Instead, transition the business to a smallbatch focused CM who provides a better strategic fit.

THIS RELATIVELY UNCOMMON SITUATION is growing in popularity as more CM's emerge that are wholly committed to small batches. **Note the distinction between a small CM that is pursuing growth through traditional means versus a professionallyrun "small batch CM" that defines its role as satisfying this select market niche.**

TYPICAL CONSEQUENCES:

- When the LPOSB OEM buyer connects with a professional "small batch CM", many of the purchasing frustrations associated with traditional CM's dissipate, namely:
 - The buyer is no longer "stuck" ordering small batches – they are enthusiastically welcomed
 - No minimum order sizes
 - No last-time-buys for assemblies
 - No required forecasts
 - No restrictions on how many products are in the portfolio (as few or as many as are needed)
 - No pressure to award more business than what makes the OEM buyer happy (large batches can be built elsewhere)
 - Every batch for every assembly for every customer gets exactly the same scheduling priority; never does the buyer have to plead to get good service on a small batch
 - Pull-ins, push-outs, and surprise rushes are not exceptions; they are handled in stride
 - The OEM need not fear getting "pruned" from the small batch CM's customer list for being unworthy (= too small).
- The small batch CM relies on a comparably large customer base (and very large array of assemblies) so as to mitigate the natural peaks and valleys of each one. In other words, the more customers and more assemblies the better (as long as each one is in a small batch).
- Unlike traditional CM's who count on the OEM to narrow their product mix and grow their batch sizes, the small batch CM encourages product diversity.
- Small batch CM's optimize their operations to maximize the flow of small batches through the shop, thereby having a cost advantage over traditional CM's who switch between large and small batches. Unit pricing is cost-competitive.
- The small batch CM "gets it." They speak the language of the LPOSB OEM and never tries to pressure them into behaving other than what comes naturally according to their business model.



CONCLUSION

The key to marketplace success for OEM's with large portfolios of ongoing small batches lies in finding the right CM partner with a complementary business model and strategy.

For those OEM's who find themselves underserved in their current CM relationship, it behooves them to examine the above options. These are the most likely outcomes of the strategic and tactical impasse they may currently face.

Should you have followup questions or comments, the author can be reached at:

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RBB specializes in recurring small batches of custom circuit board assembly, box builds, electrical control panels and other electronic assemblies.