

Research Reports
Articles

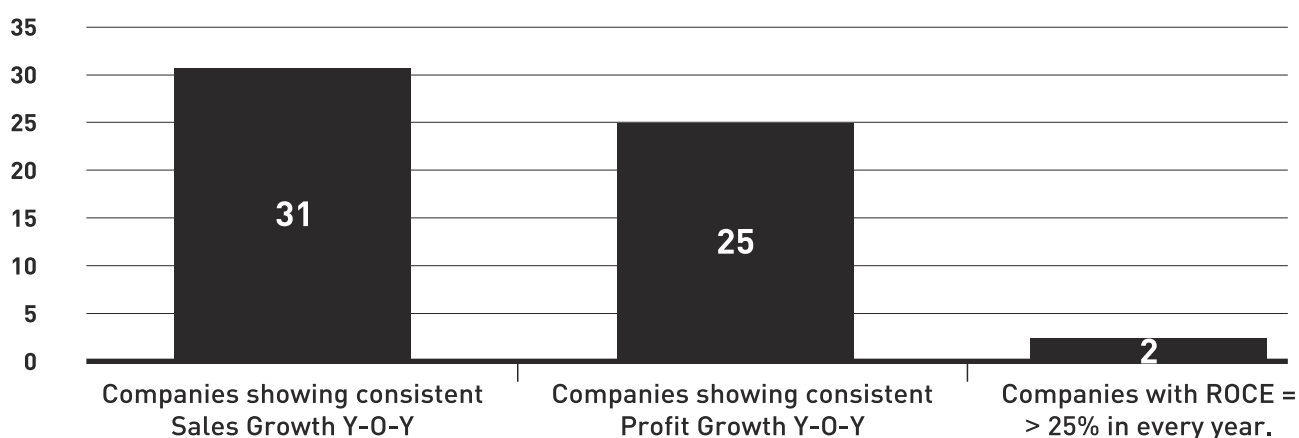


Get More Out of Less

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An analysis of the top 200 equipment manufacturing companies in India, during the last five years (2012-2016), reveals an interesting pattern. About thirty one of these companies show a consistent y-o-y sales growth between 2012 and 2016. But, only 25 achieved consistent y-o-y profit growth. And, just 2 companies demonstrated a consistent ROCE (Return On Capital Employed) of more than 25 per cent!



Financial Trend of top 200 Equipment Manufacturing Companies (2012-16) of India

Source: CMIE Database

There are four types of companies in this sector.

- Ever flourishing organizations, which are able to show consistent sales and profit growth, while maintaining a high ROCE.
- Asset inefficient organizations, which maintain sales and profit growth, but are unable to maintain a healthy ROCE.
- Turnover biased organization, which grow top line consistently but are unable to maintain consistent profit growth.
- Starving organizations, which are unable to grow consistently because of lack of orders.

Most of the organizations make annual business plans as an ever flourishing company. Yet, most of them fail to achieve that state in execution. The reasons are -

- Uncertainty and time lag between manufacturing capacity enhancements and additional demand
- Disproportionately higher working capital required for managing the higher sales and
- Increasing management strength (to improve coordination) without getting corresponding increase in output.

The recipe for being an ever flourishing company

The only way to be an ever flourishing company is to be in a state where the rate of growth of sales (and gross contribution) is always higher than the rate of growth of total fixed expenses and working capital requirements. This can happen only when the company has the:

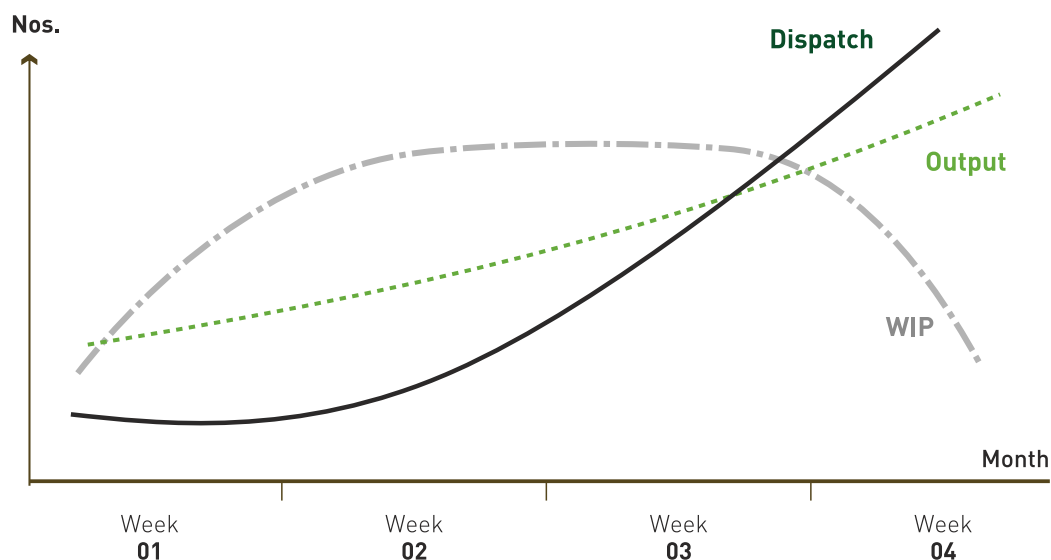
- Ability to get significantly more output than the 'best ever achieved in full load conditions' from current capacity, cash and management bandwidth.
- Ability to maintain an adequate order backlog, without dropping prices.
- Ability to always create disproportionately more capacity from small incremental investments

A company can get significantly more output than the 'best ever achieved in full load conditions' only when there is 'hidden' capacity. At the same time, it should be able to generate additional orders from same market and products, where there is 'hidden' unfulfilled demand.

Any other strategy of expanding by adding new plant capacities or going to new markets with new products without first generating additional significant surplus cash (higher ROCE), cannot guarantee an ever flourishing status.

Revealing the 'hidden' capacity

Most equipment manufacturing companies define capacity in terms of the best physical output, with a specific product mix, achieved in a month. But this does not reveal inherent potential. The correct way of looking at capacity is to measure the exact touch time on the constraint work center (like the actual time spent in metal removal in a drilling machine or time spent in assembly when complete components kit is available) and compare it with available calendar hours in a month. The 'theoretical' numbers arrived at in most cases, using the suggested method, are at least twice the best output ever achieved by the plant. Large part of the big gap between the 'theory' and 'actuals', is usually explained by periods of starvation in which the critical work center waits for either material or operators.



Symptoms of a plant with "Hidden" Capacity

Capacity and cash guzzler - the monthly planning system

Most equipment manufacturing organizations (other than those making large equipments where every component is engineered for an order) follow a monthly planning system. A snapshot of actual execution performance is taken at the end of the 'current' month and a fresh plan for next month is made, considering order spillovers of the current month and new orders. Since, planning is done closer to 'current' month-end; vendors are able to react to it only well into the start of next month. As different feeding components have varying lead times, it takes time to complete a full kit. As a result, capacity is lost in the first half of the month. WIP (work-in-progress) goes up, as initial

work centers are kept busy processing whatever components arrive. Pile-ups happen in front of assembly points with WIP and raw material inventory ballooning as the month progresses. Production of missing parts is expedited, which in turn affects the scheduling of other parts, creating a vicious loop of more desynchronization for assembly and loss of capacity (additional set ups) in parts manufacturing. Consequently, even when WIP piles up, de-synchronization causes under-utilization at assembly. Capacity is lost, not only when there is very low WIP, but also when there is excessive WIP.

As the full kits start getting ready, the remaining time (capacity) available in the month, to complete the entire plan falls short. Significant quantum of orders gets spilled over to the next month.

By the month-end, to show a lower inventory in management reports, plant managers stop inflow of parts, which cannot help in the current month's billing. This practice forces vendors to wait for fresh plans to get the right picture. At the end, snapshot is taken of pending orders and excessive WIP and raw material, and a new plan is made after 'netting off'. The same cycle of starvation in first half and pile up in second half repeats every month. If the lead time of manufacturing the equipment is higher than a month, then such skewed output waves can also be observed towards every quarter end.

The 'wave-based' movement of inventory requires high working capital due to peak WIP during the middle of the month and skewed dispatches (which cause a large volume of receivables to be due almost at the same time).

Visibility of the entire order backlog leads to desynchronized parts supply.

The solution, which isn't!

Organizations have tried to tame the wave by creating rolling plans – one month 'firm' (immediate next month) and subsequent two months 'tentative' to improve utilization of first week. (Companies with lower lead times create a tentative plan by around 15th of previous month followed by a 'fixed' plan by month-end). However, high level of expediting weakens the reliability of such projections. So suppliers do not react to tentative plans, everyone waits for the arrival of the end of the month 'firm' plan.

Exploiting the hidden capacity

The only sustainable way to improve output of equipment manufacturing plants is to ensure synchronization of parts (full kits) at assembly operations throughout the month.

The prime reason for desynchronized parts supply is the visibility of the entire order backlog to the parts manufacturers. This visibility causes them to 'cherry pick' components for processing across order backlog - for better efficiencies. Various part manufacturers have unique preferences for cherry picking. As a result, parts arrive in desynchronized manner for assembly.

A restricted visibility, with clear order level priorities forces focus on few orders, which in turn improves synchronization dramatically. The lead time of orders comes down dramatically. Uniformity of inventory flow prevents creation of 'temporary constraints', thus revealing the hidden capacity. With improved flow, the 'real' constraint is exposed. Few improvement projects on the constraint increases the output further. A process of ongoing improvement can be launched to incrementally address each constraint, as they are exposed with increasing volumes.

As the reliability of delivery improves and spillovers of orders are negligible, there is no need to reschedule orders every month end or weekend. Monthly planning can be changed to a daily perpetual planning - where orders are scheduled, based on available capacity, as and when they arrive.

Lower lead time and uniformly staggered deliveries across the month, reduces working capital requirement dramatically.

One can move away from monthly to daily planning, only if there is very high reliability of deliveries.

Revealing and exploiting the 'hidden' market

With the implementation of such flow processes, the variance in lead time performance comes down dramatically. The resultant impact is very high reliability in deliveries. When most competitors are unreliable (i.e. unable to commit and execute within a wide range of lead times), the capability of one player to commit and execute with lower lead time and specific delivery dates can be disruptive in the market. The previously 'unaddressed' delivery sensitive customer segment is likely to shift volumes to such suppliers' en masse.

In almost every equipment category, there are two classes of customers. Large institutions that buy customized products in big volumes and many small businesses or households that tend to buy in very small quantities with minimal customization.

Typically, the gross contribution percentage of such small orders is much higher than that of large institution orders. But most organizations neglect the 'smalls' because of the following reasons:

- Large orders give higher sales output as compared to small orders for same effort.
- Small customers are many and spread out; a larger sales team would be required to reach out to them.
- The plant prefers large orders for higher efficiencies.
- When the plant is loaded with large orders, the lead time of small orders become long and unreliable.
- Customers of 'smalls' shy away from placing orders on large companies.



With reliable delivery and customer preference, the efforts of sales team reduce significantly. The released capacity in the plant and the flow system enables delivery of small orders in shorter lead times. With these enabling conditions, a company can reach out to geographically spread out customers of 'smalls' by establishing a network of sales agents. The lower lead times enable agents to place confirmed orders rather than anticipated orders. Eliminating the risk of unconfirmed orders, enables the company to sell 'smalls' with advance payment. The sales efforts become negligible as small orders can be managed on 'autopilot'.

Risk-free expansion

In an environment of skewed flow, temporary constraints emerge at many places in the supply chain. When managers plan for growth in such environments, they tend to add capacity in many places.

However, in an organization with uniform inventory flow, the real constraints are always in few places. This enables organizations to invest in small incremental lots. The released capacity is used for supporting the growth in sales. This incremental approach can continue till available opportunity in current capacity and current markets is sufficiently addressed. The ROCE and operating surplus improves dramatically, thus creating a platform for adding new plants, serving new markets or creating new products with much lower risks, hence enabling an ever flourishing organization.

Vector Consulting Group (www.vectorconsulting.in), is the largest Theory of Constraints (TOC) consulting firm in Asia. The firm has been working closely with well-known companies across industries to help them build unique operations and supply chain capabilities that can be leveraged as a competitive edge in the market. Vector now has the highest number of success stories in Theory of Constraints Consulting and has also won several national and international awards for their work.

