Equipment Cost Management

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Equipment is the heart of any industry and today in the age of automation, the issue of haphazard equipment management is an elephant in the room for most SMEs (Small and Medium Enterprises) in India. Equipment technology has evolved drastically since the first pulley operated loader or steam-powered lathe. Today automation is reaching new heights with decades of data analyzed with Artificial Intelligence (AI) and implemented to suit the context using IOT (Internet of Things). Although it may sound like the beginning of a new era of efficiency but for most SMEs in India that lack proper equipment management systems, the advent would be a harbinger to survival issues. During the earlier decades most SMEs had looked upon equipment acquisition as a one-time cost and failed to plan an upgrade in future.

Every business has entry barriers in form of technical know-how, networks or assets. In the construction sector, equipment is sighted as competence indicator and lack of proper equipment simply means ineligibility to enter certain markets. Moreover the entry of foreign players with huge capital, efficient management and state of the art equipment has worsened the situation for Indian SMEs. In the industrial equipment sector, today many project tenders indicate possession of Equipment with latest computational features as an eligibility criterion. In this present scenario, immediate acquisition of latest equipment can be a solution but it would definitely be the most naïve solution sinceone shall never build a church based on Christmas-eve attendance.

Acquisition Dilemma

Since everything boils down to cost at the end of the day, to arrive at a Go / No-Go decision for equipment acquisition, one should go through a comprehensive scrutiny of costs and new market opportunities to project the ROI (Return On Investment) on asset. There are a plethora of factors affecting a cost of equipment and unless one has a plan to recover such costs, acquisition can be a bad idea. Before making an acquisition one should account for the owning and operating costs in a favorable manner as well as discover market opportunities and compare with the alternate of outsourcing.

Equipment Costs

Equipment costs are classified using conventional theories but to devise an affordable plan, derivations based on the context rather than thumb rules or popular wisdom can decrease the burden on overheads and yield realistic results. One can use the following cost structure and derivations, which are based on a research on cost optimization for road construction equipment.

Owning Costs

Ownership cost is the cumulative of all costs incurred by the owner for merely owning the equipment (Chen and Keys, 2008) and includes the following:

1. Cost of capital or MARR (Minimum Applicable Return Rate) is the opportunity cost to recover investment and receive an adequate return over invested capital(Whittaker, 1987) or the interest amount in case of a loan.
2. Depreciation is the cost incurred due to diminishing value due to deterioration of physical condition and technological obsolescence of equipment over time (Aparicio, Sanchez and Soriano, 2007).
3. Residual Value is the actual transaction when there exists an arbitrage (Kannan, 2011) and not the book value after depreciation. Various factors influencing the residual value include the condition of equipment, manufacturers perceived value, region of sale and the growth of sector.

Traditionally for sake of simplicity or being bound by accounting principles, companies record these costs on as and when incurred basis, which results in high and hence undesirable hourly rate. In the construction industry, economic life is fairly short for most equipment, about 3 to 7 years depending on project duration. But when it comes to more expensive equipment in Infrastructure Construction, equipment like automated pavers, asphalt plants, tunnel boring machine and alike are fairly expensive starting from INR 3 Crore and have a life ranging from15 to 20 years. In such case considering a fairly short economic life to coincide with loan term does not yield an affordable hourly rate. In such case to decrease the cost during initial years and bid competitively, a certain proportion of annual cost can be forwarded to a point beyond loan term considering the time value of money. Moreover since depreciation is not tan actual transaction and moreover it is exempted from Income tax, there is a certain tax saving which is actually a benefit rather than expense and hence it would be realistic to account the resultant benefit as an income rather than cost (Munshi and Pandit, 2015).

Operating Costs

Operation cost is the cumulative of all costs incurred by the owner to keep the equipment in operation(Chen and Keys, 2008), which includes the following:

1. Many researches state empirical formulas for calculating fuel and power consumptions but since it is subject to context, it is more precise to rely forecasts derived from actual operational records (Munshi and Pandit, 2015).
2. Operator cost is usually considered, as the hourly wage but one shall also account for occasional bonuses, insurance, medical allowances, accommodation and so on(Chen and Keys, 2008).This can reduce the burden on overheads. Moreover the overtime rate is higher than the hourly wage,

hence it would be realistic to account for certain overtime quota (Munshi and Pandit, 2015).

3. Maintenance is the cost associated with periodic checks and spare replacements to sustain the equipment in working condition(Edwards, Holt and FC Francis, 1998). Wear being a gradual process, condition based monitoring can give insights to the condition of components and consumables. Frequency of inspection needs to be planned carefully as frequent inspections lead to higher downtime while negligence causes breakdown (Varma and Mahesh, 1989).

4. Repair is the action required to get equipment from an inoperable state to an operable state (Kannan, 2011). The costs mostly depend on the choice of spare parts, the extent of repair, location of site and supervision cost(Edwards, Holt and FC Francis, 1998).

Larger organizations have in-house repair and maintenance workshops, which reduces the cost substantially while smaller contractors, may resort to third party services (Munshi and Pandit, 2015).

Downtime is defined as the time period during which the equipment is unavailable to perform the assigned task or activity (Prasad, 2004). The downtime costs include costs of repair, substitute equipment, consequential costs including delay cost, productivity loss and affected process for equipment working in conjugation (Vorster and Sears, 1987). Although it is an apparent fact that older equipment has more down time, the popular wisdom associated with old equipment states that as long the cumulative cost of repair and maintenance is less than the interest on new purchase, it is okay not to discard it. These downtime losses lead to significant unaccounted costs that are not reflected under any project costs and add up to the general overheads.

If all the aforementioned costs are accounted while making an acquisition decision, there shall be less of surprises in the future.

Now moving on to slack time, which is defined as the time during which the equipment is not in operation due to unavailability of work. It has been noticed in studies that the operational hours of equipment in larger organizations is far more than that in SMEs (Munshi and Pandit, 2015). In simple terms more the operational hours, lesser the hourly rate as owning costs can be distributed over more time. One can arrive at ideal operational hours by simply dividing the cumulative costs by the average market rate. But now the question arises "Can we bridge the gap?" which can be followed by two simple questions "Can we fetch enough work for the slack time?" if no, "Can we use this equipment as an alternative to some other over utilized equipment?" if no, it is clearly a No-Go decision. But if one still wants to go ahead for the sole purpose of developing a competence to enter certain market, one can calculate the slack time and look for any possibility to rent the equipment during idle time or take up no-profit-no-loss jobs by undercutting market rates and bridge the gap. Undercutting is aggressive and clients might take it as a benchmark rate for future projects, moreover it may spoil the regional market over a prolonged period. In case of companies operating only one shift, they can rent it to companies during the other shift or acquire equipment on a cost-sharing basis.

Acquisition versus Outsourcing

Before arriving at Go or No-Go decision one should also check the technically feasibility and cost of outsourcing. If work is outsourced to a smaller company, there is a possibility that the cost might be less since they own older equipment that results in lower owning costs. More over the operators do not have extra benefits apart from wages and since they have a lesser head count and fixed expenses it also lowers the overhead cost. For example; in an building construction company using re-enforcement bending machines; in one scenario where overheads and operating costs are constant, company 'A' acquired a new machine which added an owning cost of X, company 'A' also had an option of outsourcing the work package to 'B' which owns equipment beyond the economic life. In such case company 'B' would not be incurring cost of ownership but would charge a ballpark figure Y and extra operation cost Z, due to loss of productivity over time. Still the cumulative of Y and Z would be less than X.

In a realistic scenario, 'A' has 40% work that needs latest technology, while 60% works can be executed using conventional equipment. If 'A' acquires new equipment, even with a cumulative 100% work 'A' would have to operate another shift to recover costs. Market scenario: only few sub-contractors who own latest equipment charge premium due to monopoly while many sub-contractors own conventional equipment but work at low rates owing to high competition. Hence outsourcing would be feasible only at equilibrium when the cumulative cost of outsourcing is lower than the ownership cost of new equipment. In the vice versa scenario, the economical option would be acquiring new equipment and securing sub-contract work to operate another shift and recover costs. Since the existing players are charging premium for monopoly, undercutting shall still yield substantial profits. Similarly one can also compare acquisition with an alternative of lease or rent.

Apart from this, on the technical front companies shall conduct time and motion studies to determine preferred equipment capacity such that the slack time is minimum. Companies shall also identify the preferred set of features by segregating their work portfolio based on required equipment features. Since the ultimate motive is to make a profitable acquisition and plan for future upgrade, all aforementioned points can serve as a step-by-step equipment acquisition guide for SMEs in the Construction Industry.

References*

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*A complete list can be viewed at www.masterbuilder.co.in