

Why engineers should be at the heart of capex decisions



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For manufacturers, committing to a capital expenditure (capex) project is a big decision. The right choice can reduce costs, improve efficiency, boost productivity and increase profits – the wrong choice can be an expensive mistake which, in the worst cases, has to be modified or replaced within a short period at considerable extra expense.

Given the financial importance of making the right choice, it is no wonder that accounting and finance teams play such a large role in capex decision making. But it is also vital that engineering staff are involved in the process from the very start, to avoid costly mistakes such as purchasing the wrong equipment or incorrectly specifying operating parameters.

Global consulting group McKinsey & Company points out that the effective assessment of capital investment is particularly important in competitive and fast-moving markets – such as the food sector – where the returns on investment are small in relation to the cost of the capital invested. However, this assessment needs to include all relevant business skills, including operational and engineering knowledge, as well as finance and senior management.

The more comprehensive the understanding of the proposed equipment, the more likely that accurate budgets and assessments will be created and a robust capex proposal will be agreed. Engineering and operational staff often have a clearer view of potential projects beyond the cost of new equipment, to include additional expenses which may be incurred. Balancing the cost of replacement with depreciated performance requires operational experience and expertise, which engineering staff often have in abundance.

The importance of engineers

In many cases, capex decisions are driven by technology rather than business objectives. As such, involving engineers can ensure that both are given equal weight, so that technology is chosen to meet business objectives. Reaching out to all key areas of the business in capex decision making also encourages adequate accountability and is more likely to ensure employee buy-in when the equipment is eventually installed.

Consultants PwC believe that almost a fifth of businesses fail to have enough insight into proposed capex investments, something that involving engineering staff and line managers will help to overcome. PwC also point out that, 'Rather than thinking of capex planning as a process of recommendation and qualification to find the 'answer', it's better to think of capital projects as milestones in the strategy-making journey and



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thus as opportunities to explore the trade-offs inherent in every allocation of resource.'

Capex investments will vary by business, industry, size and product, but nearly all involve mechanical and electrical equipment that needs to be interfaced with other systems (both new and existing). Involving engineers in the process means you will gain a thorough understanding of the operation and process, as well as the ability to evaluate and understand the OEM operations, machinery and systems being proposed.

Depending on the type and size of the project, the exact skills required will vary, but engineers can lead the cost estimation in the planning phase of the project and contribute to ROI analysis.

Capex purchases: what to consider

Engineers often have the clearest understanding of why a particular investment is required or why certain equipment would be beneficial to the business. However, they may lack a depth of knowledge around the related detailed financial considerations which others, such as accountants, will invariably have.

One rule of thumb is that any investment which pays back within three years is worthy of consideration, as long as the ratio of capital to expense is not too great. Another consideration is the 'time value of money.' In other words, a pound today is worth more than a pound tomorrow, so it is important to analyse cash flow over the life of the project as quickly as possible to minimise payback period.

Two common metrics for assessing the value of a capital investment are Net Present Value (NPV) and Internal Rate of Return (IRR). NPV is the present value of the project's cash benefit less the current value of its costs, with a positive net present value increasing the value of a business. IRR is the discount or interest rate at which the NPV of a project eventually equals zero (i.e., how quickly a project will pay for itself). As a general rule, investment projects where the IRR is higher than the cost of capital should always be

accepted.

As well as these metrics, other key considerations include the initial investment; the effect on cash flow over time; the cost of capital; any investment tax credit; operating expenses and depreciation.

What can go wrong?

Over the years, we have seen several examples of projects being given the green light yet underperforming as a direct result of the engineering team not being fully involved during the ordering process. Invariably these situations lead to the wrong specification being implemented, which then results in a system not performing as expected, not achieving its full potential, or which requires later adjustments adding cost and time to the original budget. Some of the most common examples include:

- Using systems to handle materials which are different to that originally specified or provided for analysis (particularly common where the project is still in the development stages).
- Using systems to handle more material than originally specified.
- Using a service fluid other than originally specified.
- Changing the temperature parameters from those originally specified.

One explanation as to why this happens is because corners are cut. There is a common misconception that lower cost components can be substituted for 'non-essential' parts of the project. However, such 'cherry picking' will compromise the original design and could also affect the ability to upgrade or expand systems in the future. This is particularly true for integrated system solutions where components have strong interdependencies.

Experienced engineers are able to objectively evaluate specifications and assess whether proposed changes will negatively impact performance. They can also assess whether a solution will actually meet the requirement of the business, beyond simply looking at the capital

cost versus rate of return. In addition, they can anticipate many of the hidden costs in procurement, installation and operation of new equipment.

So, to return to our original statement. While the involvement of accountants, managers and others is essential to thorough capex assessment, it is also important that the unique knowledge and understanding that engineers bring to the capex process are given equal consideration. Failure to fully consider the engineering aspects of any capex investment can be very expensive.



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