

View Point



Challenges and opportunities in outsourcing product design & engineering

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Abstract

In a flattening world, manufacturing organizations in Europe and North America are increasingly looking at ways and means of cutting manufacturing, product development and R&D costs to make their products survive in the competitive global market.

In the last few decades, companies in the automotive, machine tools & equipment, mechanical and electronic sub system manufacturing companies have successfully adopted manufacturing in low cost locations as part of their survival strategy but when it comes to moving design and engineering work outside their main location or country, they face many challenges – both internal and external.

Before embarking on an outsourcing initiative companies should seriously look at the following to bring the alignment required –

- Culture within the organization towards moving work outside
- Management support and the organization's ability to accept and involve third party organization in product design.
- Government regulations and incentives
- Portion of the design and R&D work that can be outsourced to make the initiative economically viable.
- Availability of core engineering talent in the low cost country

If the above parameters are evaluated before the decision to outsource, the outcome will be a successful engineering outsourcing story.

This document brings a practitioner's perspective of the challenges manufacturing organizations face when they decide to outsource their design and engineering activities, opportunities and best practices in the fast changing world.

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Introduction

In the present day flattening world where trade boundaries are disappearing, emerging markets and developing countries are becoming increasingly important for manufacturers both to sell their products and to source parts & services. The key for any product manufacturer is to manufacture their products where it makes economic sense, but engineering managers are very apprehensive about outsourcing design and engineering which is core to any manufacturing company. Product design and R&D constitute a significant part of cost associated with new product release.

Many large and medium sized companies have outsourced design and engineering successfully to India either through their identified partners or through their own captive units.

Leading manufacturers have embarked on strategic engineering outsourcing initiatives to take advantage of the large engineering talent available in India at competitive costs. Many of the service providers have proven and certified remote engineering management practices and some even use advanced techniques for executing engineering projects such as six sigma principles, design of experiments etc.

If companies focus mainly on staff augmentation mode to realize the benefits of outsourcing they may not meet their goals, as this model is linked with many disadvantages like low productivity, improper skills, lack of training, high manpower turnover, no control on the external resources in their team, low quality output etc. On the other hand companies may find it very difficult to package a piece of work and ship it to a low cost location – the success in this case depends on the outsourcing companies ability in managing an engineering or design project remotely, soundness of the governance structure, communication link, quality and project management process etc.

Most Engineering managers are of the opinion that core engineering can not be sent outside their premises (or outsourced) but only low end activities like detailing or 3D modeling can be easily outsourced. While this is a safe approach, this may not yield good results, on the contrary there are several success stories where in companies have successfully outsourced their core R&D and engineering activities.

An attempt has been made in this point-of-view document to analyze the challenges and opportunities that exist in outsourcing R&D, design and engineering.

Challenges

By analyzing the successful case studies in outsourcing, it is clearly evident that manufacturing companies addressing the following challenges will be successful in their R&D or engineering outsourcing initiatives –

- Organization wide involvement with critical mass
- Phased approach with a structured evaluation and monitoring framework
- Extended Design office
- IPR and trust in the partner company
- Man power turnover

Organization wide involvement with critical mass

The engineering outsourcing initiative will be successful, if it is driven from top with involvement from different levels. It should be part of the DNA of the organization's growth strategy. We have come across many cases where the top management's decision to outsource the engineering and R&D activities fail due to lack of support from the lower levels. The focus has to be on organization's core product development activity and design productivity improvement and not cutting design jobs. We have also seen many successful companies outsourcing their engineering and even R&D activities keeping significant part of the engineering within their company – the key here is to identify what is core to company and what is non-core which can be outsourced. Also, any outsourcing programs needs to have a critical mass, hence involvement of different units and groups within the organization is essential – important factor here is organization wide involvement.

Phased approach

Companies deciding to take the outsourcing approach have done it in a very scientific and pragmatic way. Starting from the parameters used to evaluate the potential outsourcing partners to what to outsource and when. Many engineering outsourcing success stories reveal that a phased approach – beginning with a pilot project, evaluating the lessons learnt and analyzing the

shortcomings has delivered good results. Making the companies own engineering team accountable for the success of the outsourcing initiative is very essential by making them part of the steering committees, setting up measurable evaluation and monitoring parameters etc. contribute to the success of the initiative. While this is time consuming process, on a long run it delivers the desired results – when an organization is attempting to outsource their engineering activity, which is core to their business unlike general IT, delays and road blocks are bound to surface, a well crafted road map for engineering outsourcing will certainly strengthen the process.

Extended Design office

The common mistake outsourcing organizations make while getting the engineering or R&D work done by third parties is, not treating the partner as an extension of their own facilities. This will hamper the entire process by key people involved not sharing the relevant information with the partners. We have case studies where in the outsourcing organization treats the partner as their own team by exchanging relevant engineering data, training and talent management processes, getting involved in the delivery & program management activities of the partner organization. Senior managements of both the organizations (outsourcing company and the partner company) should have the same performance indices to the participating managers which include cost, quality, timely delivery and knowledge transfer.

IPR and trust in the partner company

A sound services agreement encompassing data security, IPR and non disclosure of vital information is very important. Once a framework agreement is in place, the seriousness with which it has been crafted has to be communicated to the operating levels, otherwise there will be several doubts in the minds of the people from the outsourcing organization on what to share and what not to and its implications. The management of the outsourcing company has to invest in efforts towards building the level of trust required in their organization to trust the partner company, unless there is a concerted effort in this direction the engineering outsourcing initiative will be incomplete and can not realize the benefits of outsourcing to the fullest extent. We have come across cases where the outsourcing companies rewarding the employees of the partner companies for their contribution towards improvements, innovation etc. which will build the trust and commitment – which is vital to any engineering outsourcing initiative.

Man power turnover

Control on attrition is very crucial, many a times the cost benefits of outsourcing is lost due to loss of trained manpower resulting in lowered productivity levels. Successful engineering outsourcing plans have detailed manpower retention and controlling the learning cycle embedded in the plan.

Opportunities

We believe manufacturing companies realize benefits of successful engineering outsourcing in multiple ways. The key benefits are -

- Focus on core activities
- Significant reduction in product development cost and time
- Flexible pool of resources

Focus on core activities

Engineering activities of any organization can be classified into core and non-core, core part is the heart & soul of the organization which determines its market position, non-core is the part which can be easily done outside their core engineering team and the results of which can be easily integrated with the core product development activity. This makes the complete product development very cost effective and makes the end product very competitive in the market. For example for an agricultural machinery manufacturer, core activity could be to develop innovative grain cutters and bailers to suite different boundary conditions and modularize the design so that they can release innovative new products at regular intervals with lesser development cost and time. Non core activities could include the design of cabins, exteriors, structural components and detailed engineering activities etc. By outsourcing non-core activities companies can focus on core product development to meet changing customer expectations.

Significant reduction in product development cost and time

A well defined engineering outsourcing initiative can reduce the product development cost significantly, based on our experience the cost benefits could be in the range of 30-40% compared to what is spent on maintaining an in-house team or using onsite contractors for the product development activity. We have examples of reduction in development time by almost 30% because of the extended working time available due to the time difference between India and Europe or USA.

Flexible pool of resources

Outsourcing also helps companies to maintain a thin core engineering team and have a flexible resourcing arrangement to meet the cyclic nature of their engineering and product development requirements. Companies do also demand design productivity improvements in an established relationship to be passed on by the outsourced company. The availability of a large skilled engineering talent pool offers flexibility and quality without investing money and time on recruitment, training and re-training.

Captive centers and JVs for engineering activities v/s outsourcing:

Some companies take the approach of Joint Ventures or setting up their own captive centers in India, the success of these centers depends on their ability to attract and retain the best engineering talent, lack of tools and processes to manage the projects through these centers where the end beneficiary is outside India, lack of knowledge management practices, integration of the India center's activities with that of the parent organization, experience in remote engineering project management, training and certification processes etc. Outsourcing to a professionally managed company offers several of these benefits both from commercial as well as operational dimensions.

Conclusion

Organizations with a very structured outsourcing framework which encompasses evaluation of potential suppliers, transition of engineering activities from their organization to the partner and monitoring the health of the engineering operation through structured reviews, controlling the man power turnover etc., will be successful in their venture and reap the benefits of outsourcing engineering and R&D activities.

There are misconceptions about engineering outsourcing, often managers think they need to run a parallel program management office to run an outsourcing program which is far from reality. Coordinating the outsourced activities can be an integral part of the department managers giving out work and do not require dedicated resources to handle this.

A well planned and implement engineering / R&D outsourcing program can bring in around 30-40% reduction in product development cost and time in the first 12 to 18 months of the operations.

About the Author

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