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# THE ENGINEERING SERVICES MARKETPLACE

The global engineering services industry is fast moving in the same direction of BPO and IT with the offshore aspect of such services realigning the distribution of work independent of geographical limitations. Engineering Services Outsourcing (ESO) is fast becoming a major part of the engineering services and like many other domain knowledge intensive services has carved out a niche for itself in the offshoring space. Although, the worldwide market for such services is still very small, it has large growth potential. Currently, the market is equitably distributed with India having a slight advantage owing to its offshoring precedence.

According to Booz Allen Hamilton, the global engineering services market is currently about USD 750 billion which is expected to touch USD 1 trillion by 2020. While the overall industry may be large only a small portion of about USD 10-15 billion is currently being offshored. The small size of the offshore pie is a clear indication of the immense growth potential of the segment.

This paper delves into further details of this very attractive and growing industry with far-reaching impacts.

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## Market Landscape

The ESO market is largely divided among the usual offshoring majors (India and China) and countries with strong engineering background (CIS, Eastern Europe). Nearshore destinations like Mexico and Canada also have a fair share. The US$ 10-15 billion offshore space is largely shared among these countries with the Indian share estimated between US$ 1.2 billion and US$ 3.1 billion. By 2020 the offshore segment is expected to touch between US$ 150-225 billion with India occupying a dominant position. However, before we delve into the market any further, it is important to establish clarity with what defines engineering services.

**Definition**: ESO services can be loosely defined as the outsourcing / offshoring of activities related to the creation, development, and maximization of a product / service by improving the life cycle through various optimization techniques. This may not only include the product but also associated actives like processing, delivery etc.

## Evolution of Demand for ESO Services

The industry is still in early stages of globalization, having established for itself viability with outsourcing / offshoring, now it is decidedly and progressively moving into a more aggressive mode. During the inception stage outsourced engineering services was limited to sending basic drafting work to outside vendors, who were predominantly large pure-play engineering services firms – pure-play is defined as organizations that focus on one specific capability and build compelling value-propositions around it [in this case being engineering]. Such services were largely restrictive in nature due to the limited mobility of such tasks. However, the greater involvement of IT resulted in the automation of similar services, thus making it easily dispersible. With development in communications technology another dimension to local ESO was added, that of offshore ESO. Like all other technology-driven services, ESO is also a result of the narrowing gap between geographical locations enabling access to diverse human talent. The offshore ESO market was initially limited to the development of engineering-design software. However, in the past three years multiple functions were considered offshore-able and currently almost the entire value chain can moved to offshore locations, reflecting on maturity of the marketplace both for sourcing and for provisioning services within the engineering space, regardless of the industry. One worthwhile point to note is that the earliest adopters of the ESO model are companies within the automotive, aerospace and component manufacturing [heavy engineering] industries. Increasingly more industries are joining and contributing to the growth in ESO services, especially Oil & Gas, Fluid Component Systems, and Heavy Industrial Manufacturers etc.

## Major Market Segments

Following are some of the major markets/ industries contributing to the growing demand for ESO services.

- Aerospace
- Automotive
- Chemicals
- Pharma
- Industrial Machinery
- Minerals and Metals
- High Technology
- Oil & Gas
- Utilities
- Construction
- Food and Beverages
- Medical Devices

While almost all major industry vertical depends on outsourced engineering services it the automotive, aviation, construction, utilities and hi-technology industry that make up for more that half of the demand for ESO services.

## Major ESO Services

As the ESO market reaches a state of maturity, prime engineering services providers are looking at providing end-to-end vertical specific services. This is important as unlike other offshore activities, engineering services cannot be easily divided into smaller segments. Some of the high end engineering activities experiencing high demand include the following:

- Avionics
- Enterprise Asset Management
- Embedded Systems
- Plant Automation Services
- Product Engineering
- Plant Design Engineering
- Electromechanical Manufacturing Services
- Product Lifecycle Management (PLM)
- Geospatial Technologies
- Manufacturing Services and Solutions

## Low Complexity Repeat Tasks

A major portion of the ESO market still comprises of low value-high volume tasks requiring minimal supervision. Most of these tasks are repetitive in nature and have a low revenue yield when compared to other engineering services.

- System Engineering
- Electrical Deign
- Drafting and Documentation
- Auxiliary Functions
- Component Testing
- Mechanical/ Electrical Analysis
- Technical Manuals
- Shop Drawings
- Quantity Estimates

As other segments require high skills levels and have high entry barriers, it is the low end segment which has a larger concentration of ESO service providers.

## Current Leaders In ESO Services Provisioning

**The India Advantage**

The positive stand of the Booz Allen report is reaffirmed by another report published by the AF Ferguson which expects the Indian share of the ESO space to touch about US$ 30 billion p.a. out of a total offshore-able market of US$ 110-140 billion by 2015. Like other offshoring avenues, the Indian ESO potential also largely revolves around cost and skill availability. Some major factors include:

**Advantages**

- Cost: The biggest advantage is that of the low hourly charge rates. The blend rate (includes initial travel to onsite location etc.) can be as low as USD 25 per hour for medium complexity task as against USD 60 in the US. In terms of salary differential, an experienced mechanical engineer in the US may get about USD 10,000 per month as against USD 3,000 for a person with similar skills in India.
- **Talent Pool**: India has the largest pool of qualified engineers in the world. The number of engineering graduates joining the workforce each year along with that of the existing skill availability makes it larger than China and Russia put together. This further improves the cost to labor supply.
- **Related IT Support**: Having a good IT support systems in terms of a developed IT hubs is a big benefit for the ESO space. This is especially the case of software centric tasks like CAD/CAM designing etc.
- **Domestic Market**: Another important advantage is the high domestic growth. This has resulted in many companies using offshoring activities to foray into the local market. This can be gauged by the interest in the automotive industry. Large companies like Toyota have intertwined their offshore requirements so as to carter to the domestic engineering requirements. The case is much similar in other industries like aviation as well.
- **Offshoring Precedence**: Having an offshoring history also augurs well with India. With the success of IT and BPO segments, investors are not wary of large scale commitments. Also, the constant effort of improve the overall quality and services delivery plays a positive role.

**Concerns**

- **Employability Potential:** One of the major challenges posed to the Indian ESO prospect is that of the employability of a large section of the available workforce. Only a very small percentage of the available talent is deemed appropriate to be employed with the rest requiring extensive re-training. Most of the skill related issues are largely a result of an outdated curriculum and very limited exposure to real time tasks. Experts have suggested an overhaul of the system to include more relevant courses and 'on-the-job' training to be more attuned to the market requirements. This has also been seen as one of the major pre-requisite to corner a larger share of the offshore ESO market.

- **Infrastructure Constraints:** Unlike other offshore centric activity which is quite independent, ESO requires a very well developed physical infrastructure. It is essential as most of the activity is closely liked with activities on the 'shop-floor'. This puts pressure on the country not being perceived as an attractive destination when compared to China and Canada.

- **Offshore Maturity:** While other offshoring activities have evolved over a longer period of time of over a decade, ESO is still at a very early stage of offshore maturity. All segments of the ESO space have been offshore for less then five year still leaving large scope for improvements. The only aberration here is the automotive industry which commands over ten years of similar experience.

- **Confidentiality:** As ESO deals with activities integral to a company, IP protection and confidentiality are major concerns. Activities as basic as converting technical diagrams using CAD/CAM to as complex as the design of an entire Product Lifecycle Management (PLM) system requires a high degree of protection. However, this is not major area of concern and not restricted to India as an offshore destination.

## MAJOR INDIAN ESO COMPANIES

The India ESO space can be segmented into two large segments: (a) pure play ESO companies offering specialized services largely based on IT centric solutions and (b) large IT services companies offering a more inclusive line of services to their larger clients. However, the one common thread among all the segments is that of the use of local software capability to drive growth.

While, stand alone companies focus on specialized services like geospatial, CAD/CAE/CAM and engineering software, the larger players focus on offering end to end services in the areas of avionics, PLM, automation services etc. The following table mentions the larger players in each category:

| Large IT Players[1] | Specialized ESO Firms[2] | Engineering Subsidiaries | Captives |
|---|---|---|---|
| TCS | InfoTech Enterprises | Ashley | GE |
| Tata Technologies | Rolta | Mahindra Engg. | Caterpillar |
| HCL | QuesT | Hero Engineering | Delphi |
| Infosys | Neilsoft | Harita | Ford |
| Patni | Geometric Software | | Siemens |
| L&T InfoTech | | | Bosch |

Most of the players have also managed to carve a niche by offering product or vertical specific service. For example, InfoTech Enterprises has Airbus and Boeing as its clients and focuses on aviation, L&T InfoTech mostly has construction and civil engineering clients. Offshore captive units of large multi-national companies are also playing an important role. This can be gauged by the increasing number of patents being applied by these centers for the parent companies. Many large captive centers like the GE and Siemens consider its offshore center being an integral part of its innovation cycle further reaffirming the potential of the space.

[1] Large IT Players: Ranked in terms of Engineering Services Outsourcing (ESO) revenues
[2] Specialized IT Services Firms: Ranked in terms of Engineering Services Outsourcing (ESO) revenues

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