# Assessing the cost of Outsourcing: Efficiency, Effectiveness and Risk

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## Abstract

*Offshore outsourcing is a popular approach for companies looking to reduce software development costs. We have found that the full picture of cost and value requires looking at efficiency, effectiveness, and risk.*

## 1. Introduction

One of the challenging issues with outsourcing is determining how to measure success. Landmark Graphics has been involved in offshore development for 5 years and has wrestled with this issue for some time. We have come to the realization that the full picture of cost and value requires looking at efficiency, effectiveness, and risk. particularly when looking to offshore providers, is determining which projects to outsource and how to balance an overall project portfolio.

## 2. Efficiency

At first we were focused on the pure economics of the development costs, i.e. efficiency. The seemingly low costs for offshore development made it look attractive as a means to reduce costs. Table 1 indicates our experience with the relative cost for a developer for several countries.

**TABLE 1**

| Country | Approx Cost relative to US |
|---|---|
| US | 1.00 |
| Canada | 0.85 |
| India | 0.40 |
| Pakistan | 0.25 |

Looking just at the relative costs, it is common for the media to spout out figures such as outsourcing can reduce development costs by 75%. Most analyst groups such as Gartner or Forrester are far more realistic and a more common figure quoted is that outsourcing could reduce development costs to 75%. Likewise, we realized that cost per developer was a relatively meaningless metric on its own. What is really of interest is the cost to deliver the project. Two additional parameters influence the project cost: the efficiency of the developers and the internal management overhead required for the project. Using these three variables we established a first order indication of the outsourcing savings (see appendix for a more detailed derivation).

$$Savings\% = 1 - \frac{c + m}{e}$$

***Where***

***e*** = OUTSOURCE efficiency = Equivalent INTERNAL days per OUTSOURCE day

***m*** = INTERNAL Management overhead = INTERNAL days to get 1 OUTSOURCE day

***c*** = OUTSOURCE relative cost = cost per OUTSOURCE day / Cost per INTERNAL day

As a forward looking metric, this ratio has significant uncertainty. We've seen efficiency (*e*) range from 0.10 to as high as 1.0, but then efficiency can only really be estimated since we don't really know how long this would have taken had it been done internally. To get a meaningful metric, it is imperative that the efficiency (*e*) be measured in a manner consistent with the cost ratio (*c*). It is quite typical to compare cost ratios of experienced internal developers against quite junior outsourced developers. If that is how *c* is measured then *e* must be measured using that same comparison. It is also important that *c* be calculated on a consistent basis. If a mix of offshore and onshore developers is utilized, the cost should be a fully burdened blended rate and the internal cost should be the incremental cost of a developer.

In our experience management overhead (*m*) tends to run about 0.05 to 0.25. This management overhead should be considered as the incremental activity that would not be required if the work were to be done internally. A high management overhead can significantly reduce or wipe out any potential savings. One might think that more management overhead

would result in higher efficiency. What we have found is a bit of an inverse—higher efficiency allows a lower management overhead. This happens because when the offshore team is functioning efficiently they do not require much management oversight. Again, while there is uncertainty in *m* we have found that measuring *m* for prior projects is a useful indicator for future projects.

In Table 2 we show a small sample of projects from some of our early outsourcing projects.

**Table 2**

| | e | m | c | Savings |
|---|---|---|---|---|
| **Development** | 0.40 | 0.11 | 0.16 | 33% |
| **Testing** | 0.27 | 0.04 | 0.18 | 16% |
| **Testing** | 0.60 | 0.06 | 0.19 | 59% |
| **Testing** | 0.60 | 0.05 | 0.19 | 60% |
| **Development** | 0.60 | 0.17 | 0.23 | 34% |
| **Development** | 0.64 | 0.17 | 0.23 | 38% |
| **Testing** | 0.80 | 0.06 | 0.17 | 72% |
| **Development** | 0.56 | 0.13 | 0.30 | 23% |
| **Testing** | 0.40 | 0.10 | 0.20 | 26% |
| **Testing** | 0.60 | 0.06 | 0.21 | 55% |
| **Testing** | 0.20 | 0.05 | 0.27 | -56% |
| ***Average*** | | | | ***33%*** |

## 3. Effectiveness

While efficiency is looking at the cost side of the equation, effectiveness is more focused on the value that the development delivers. The value is driven by the ability to deliver the product with the features that are needed at the time that they are needed. We have not attempted to quantify a measure of effectiveness. However, we have identified several drivers that can have a major impact on overall effectiveness and value generation.

### 3.1 Project Delay

A delay or early delivery of the product could have a significant impact on the value delivered. If the primary focus is on cost savings, then there is a very real possibility that the project could have delays resulting in a potential value loss which could be several times greater than any cost savings. On the other hand it is possible that a well functioning and efficient outsourcer could produce results faster than could be delivered internally.

### 3.2 Value Creation

It is well known that the software features that provide maximum value are rarely well known at the beginning of the project. Features evolve over the development cycle. Offshore development brings two major challenges to the issue of scope change management. First, the remote communication makes it more difficult to get rapid and timely feedback as changes are identified. The second, perhaps more important issue, is that oftentimes features are discovered via rich dialogue between users of the system and the developers. The limited communication channels available often miss this opportunity and the result is a delivered product with less value than could have been developed internally.

### 3.3 Value Delta due to Quality

Poor quality is another means by which value can be reduced. Some outsourcers are able to have very high quality standards and as a result often product results superior to what is routinely developed internally.

### 3.4 Value Delta due to Local Presence

Some companies are realizing that there is value to be gained from having a local presence in a particular area. This presence can serve to open up markets which are otherwise difficult to penetrate. Additionally, sometimes local talent understands the local business and as a result brings value by surfacing potential opportunities. On the other hand, there is a potential for value loss if an outsourcer is identified as being from a location which is viewed negatively by other major markets.

## 4.0 Risk

The savings that are obtained by outsourcing are not free of risk. There are several elements of risk that should be considered and the savings measured against the risk exposure. Risks could impact either costs or they could also impact value. The net exposure is given by the sum of the probabilities of each risk and the individual exposure.

$$Exposure = \sum p_i E_i$$

The following risks are likely to be of concern with an outsourcing project, particularly with an offshore project:

### 4.1 Technical Risks

Technical risk is a measure of the fit between the project and the skills and capabilities of the outsourcer.

It can also be present if there is risk associated with the ability of the customer to able to deal with an outsourcer. To a certain extent the technical risk is the primary driver of the uncertainty in the efficiency mentioned earlier. Some of the questions to be asked include:

- Does the outsourcing company have the technical skills necessary to do the work?
- Does the outsourcer understand the business domain?
- Can the project requirements and specifications be defined to meet the capabilities of the outsourcer?
- Does the outsourcing company produce high quality results?

### 4.2 Political Risk

Many of today's outsourcers are in developing nations. Some of these nations do not have the most stable of governments. Landmark first started working with a Pakistan outsourcer in 2000. The terrorist attacks in New York had a huge impact on our ability to continue business. Prior to that time we had been able to bring a number of people from Pakistan to the US for training. For quite some time after the attacks it was nearly impossible to get visas. Furthermore, our company placed a moratorium on travel to Pakistan due to terrorist attacks there. Fortunately we were able to get the first group trained and have had reasonable success with this arrangement, but it did limit the projects and activities that we could outsource.

### 4.3 Outsourcer Risk

What is the contingency if the outsourcer goes out of business? Does the outsourcer have high employee turnover? We have had experience with large companies and with smaller companies. Employee turnover has been considerably higher at the larger companies. For our business this is a major consideration since the learning time is quite long.

### 4.4 Financial Risk

Over the long term a global labor pool should result in an equalization of wages and the cost differential should largely disappear. Countries such as India are experiencing 15% annual salary inflation. Currency fluctuations can also have an impact on a global labor pool. In 2001 the Canadian dollar was about $0.60 USD. This made Canada look like a very attractive location. Today the Canadian dollar is about $0.85 USD so it has lost some if its cost advantage.

### 4.5 Security and Intellectual Property Risk

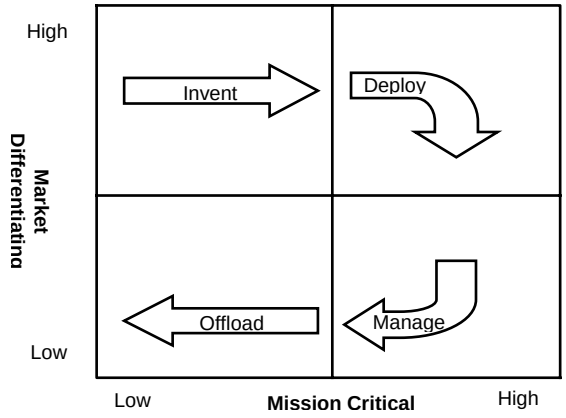
The culture and laws of many outsourcing countries as they relate to intellectual property are quite different from that of western countries. Even when the laws claim to honor intellectual property there can be a major issue trying to enforce the laws. Honest mistakes can also be made by the outsourcer. There is a risk that the outsourcer will introduce something into the product which will expose the company to intellectual property challenges made by a third party. The reality is that there is risk that intellectual property can be compromised and a prudent company will try to understand that risk.

## 5. Conclusion

We have had sufficient experience with offshore outsourcing to know that there are opportunities for cost reduction. We have had very good luck with Canada where we are able to essentially get one-for-one efficiency and reap the cost benefit with almost no risk. We have had varied success with outsourcing to Indian and Pakistani providers. Some projects have been greatly successful while others have not. While each additional project teaches us something new, it is fair to say that the risk profile is inversely proportional to the cost profile. The challenge is to find those projects in our portfolio for which the cost savings are sufficient to overcome the additional risk exposure.

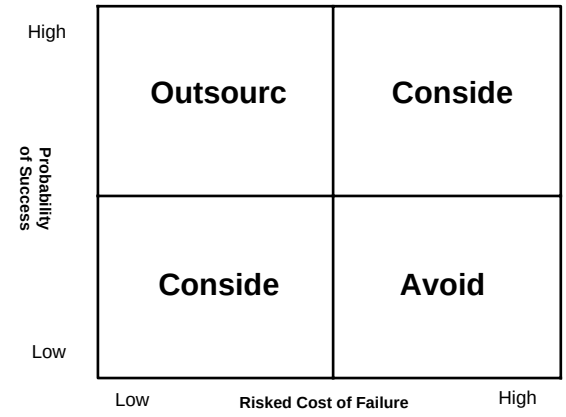
The model in Figure 1 that Geoffrey Moore published in "Dealing with Darwin" is useful to characterize projects by their product lifecycle. Those projects that are not particularly market differentiating or mission critical are most amenable to outsourcing since cost reduction is a desired objective for those projects.

Figure 1




A further tool for project selection is shown in Figure 2 as a 4-quadrant graph showing probability of success on the y-axis and cost of failure on the x-axis. In general we have looked to outsource projects that are in the upper left quadrant where we believe that the probability of success is high and the cost of failure is low. These ideas are common sense, but not always common practice.

Figure 2



## Appendix: Cost Savings from Outsourcing

Nomenclature:

- $n_i$ Expected Number of staff required if project done Inhouse
- $c_i$ Average burdened cost of Inhouse staff
- $n_f$ Number of Offshore staff required
- $c_f$ Average burdened cost of Offshore staff
- $n_n$ Number of Onshore Outsource staff required
- $c_n$ Average burdened cost of Onshore Outsource staff
- $n_m$ Amount of Incremental Management Overhead
- $c_m$ Average burdened cost of Management Overhead

- c Blended Cost ratio = $[f \bullet c_f + (1-f) \bullet c_n]/c_i$
- e Outsource Efficiency = $n_i/(n_f + n_n)$
- f Fraction of Outsource staff Offshore = $n_f/(n_f + n_n)$
- m Management Overhead factor = $n_m/(n_f + n_n)$

$$Savings\% = \frac{\text{Cost Savings}}{\text{Cost Inhouse}}$$

Cost Savings = Expected Cost Inhouse – Cost Outsource - Cost of Overhead

Cost Outsource = Cost Offshore + Cost Onshore

Expected Cost Inhouse = $n_i \bullet c_i$

Cost Offshore = $n_f \bullet c_f$

Cost Onshore = $n_n \bullet c_n$

Cost of Overhead = $n_m \bullet c_m$

$$Savings\% = \frac{c_i n_i - c_f n_f - c_n n_n - c_m n_m}{c_i n_i}$$

$$Savings\% = 1 - \frac{c + \frac{c_m}{c_i} m}{e}$$

if $c_m \cong c_i$, then

$$Savings\% = 1 - \frac{c + m}{e}$$