Understanding the Reshoring Decision-Making Process Using AHP Approach

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Abstract

Reshoring is garnering attention in the popular press and the academic literature. There have been several high profile cases of U.S. manufacturers returning some offshored operations to the US. This has encouraged other manufacturers to consider shifting their outsourced production and sparked public interest in the phenomenon of reshoring. In addition to overt labor costs, there are also many hidden costs associated with offshoring. Reshoring is not just for manufacturers; service industries may find advantages as well. This paper presents an approach to analyzing the viability of reshoring versus outsourcing for specific types of industries. A survey of eleven companies was analyzed by analytical hierarchy process (AHP) and is used to demonstrate how the decision-making process regarding reshoring can be understood. The preliminary findings are that logistics cost and proximity to customers are common factors driving reshoring, but other factors such as quality varied by industry. More data collection using this approach is recommended.

Keywords
Reshoring, analytical hierarchy process, outsourcing, offshoring, nearshoring

1. Introduction

Reshoring is defined by Stuart Burns as “the bringing back to the US of manufacturing lost to emerging markets as US firms sought to compete against low-cost imports in the last decade” [1], and by Kris Maher and Bob Tita as “a growing movement among manufacturers to bring more operations back home” [2]. ‘Reshoring Initiative’ defines its mission as “to bring good, well-paying manufacturing jobs back to the United States by assisting companies to more accurately assess their total cost of offshoring, and shift collective thinking from ‘offshoring is cheaper’ to ‘local reduces the total cost of ownership’. Reshoring does not apply solely to manufacturing companies. It is also equally applicable to service industries. Companies such as GE and Galaxy Solutions are reshoring IT functions as well [3].

Similar to ‘reshoring’ is ‘inshoring’ [4]. There is also a term as ‘Nearshoring’ which is defined as “outsourcing work to companies with the economic benefits of an offshore location, but a closer cultural, linguistic and geographic fit with the user organization” [5]. Although ‘nearshoring’ does not lead to a company moving its processes to its home country, it does optimize the key issues associated with offshoring. Choosing nearby country minimizes cultural differences that could lead to miscommunication, shipping distance leading to low shipping cost and faster delivery, and problems that may arise for slow response due to being in drastically different time zones. The outsourcing destinations are chosen due to their perceived extreme cost advantage with an emphasis in the area of low cost labor. It is possible that the perceived cost advantage of locating outside of the United States does not truly exist and can be dispelled by exposing associated hidden costs. The emerging outsourcing market trends may provide evidence of this. Two major country of the outsourcing market are China and India, but the percentage of the market that they claim is shrinking [6].
In 2008, India played host to 60% of companies who outsource; in 2011 India claimed slightly less than half of that amount with 29%. In the same time period, China lost nearly 10% of the companies. Between 2008 and 2011, China lost nearly 10% and India lost about 30% of the companies who chose to outsource within it, and Southeast Asia dropped from 50% to 24%. While Asia is losing favor as an outsourcing destination, the United States has entered the ranks. In 2008, the United States did not rank as an outsourcing destination; but, in 2011, it hosted 6% of outsourcing companies. In addition to the United States, Western Europe is showing a positive change, and Canada has remained relatively constant [6]. Hackett Group's report "Reshoring Global Manufacturing: Myths and Realities" also predicts the cost gap between China and US will be only 16% by the year 2013 [7].

Outsourcing is losing popularity. A study conducted by BDO USA, LLP in 2011 found that 35% of U.S. based technology companies were outsourcing services or manufacturing. This represents a decline from 62% in 2009. 50% of CFO’s surveyed gave an uncertain business/political climate or international business and tax regulations as their main reason for not outsourcing [6].

Table 1: Trend in Current Outsourcing Destination [6]

<table>
<thead>
<tr>
<th>Current Outsourcing Destinations</th>
<th>2011</th>
<th>2010</th>
<th>2009</th>
<th>2008</th>
</tr>
</thead>
<tbody>
<tr>
<td>Canada</td>
<td>9%</td>
<td>11%</td>
<td>4%</td>
<td>17%</td>
</tr>
<tr>
<td>China</td>
<td>35%</td>
<td>44%</td>
<td>19%</td>
<td>46%</td>
</tr>
<tr>
<td>Eastern Europe</td>
<td>9%</td>
<td>17%</td>
<td>12%</td>
<td>19%</td>
</tr>
<tr>
<td>India</td>
<td>29%</td>
<td>36%</td>
<td>50%</td>
<td>60%</td>
</tr>
<tr>
<td>Latin America</td>
<td>9%</td>
<td>22%</td>
<td>8%</td>
<td>19%</td>
</tr>
<tr>
<td>Southeast Asia</td>
<td>24%</td>
<td>36%</td>
<td>31%</td>
<td>50%</td>
</tr>
<tr>
<td>United States</td>
<td>6%</td>
<td>11%</td>
<td>8%</td>
<td>N/A</td>
</tr>
<tr>
<td>Western Europe</td>
<td>24%</td>
<td>22%</td>
<td>19%</td>
<td>21%</td>
</tr>
</tbody>
</table>

If the total cost of a product when produced in the United States is comparable to the total cost of the same product when produced outside of the United States; a company may consider returning to the United States. Should this happen, the United States will face a loss of revenue due to no longer being able to collect tariffs on the aforementioned product. This may be a substantial loss. Although, in 2004, tariffs made of only 1.19% of the United States total tax revenue, the value of that percentage was $21 billion [8].

This introduces the issue of whether or not reshoring would be economically beneficial to the United States as a whole. Although there will be a loss of tax revenue due to the lack of tariffs, this may be negated by new tax revenue generated by the opening of a new facility within the United States. Should the loss in tariff revenue equal the gain in new tax revenue, this is a null issue. If it is not, a thorough analysis of each potential reshoring project will be necessary. Even if the loss were greater, reshoring may still be a viable option if the facility creates employment that leads to increased wealth and decreased dependence on government benefits at a level that compensates for the lost tariff revenue. The offshoring experience of various companies is worsening day by day. For example, the quality of the offshoring experience of contact centers is declining. Currently only 10% of companies view offshoring contact centers as a reasonable way to reduce operational costs [9]. The offshoring experiences of various companies are likely influenced as being positive or negative based upon cost factors too. Should there be substantial cost benefits to offshoring, a company may choose to offshore. The various types of costs that may be involved in this decision include labor cost, distribution costs and possibly even spoilage allowances.

Seeing these factors many companies are considering reshoring. A study conducted by the Boston Consulting Group (BCG) found that over one third of large manufacturers consider reshoring [10]. There is lack of any formal model to help in taking sourcing decisions. In the following sections, after discussing some affect upon BLS productivity, the paper focused on the issues of outsourcing followed by some case study of various company that are reshoring. It also identified several factors which affect the industries' reshoring policy. After that a brief literature review is provided. Following a proper methodology, this paper analyzed the trend in business strategy from collected data (i.e. given importance on reshoring parameter by various companies). This paper tried to find out the priority towards reshoring.
for a specific type of industry. Finally, it provided some recommendation about reshoring and outsourcing decision in the light of real time case study.

2. Effect of Offshoring and Outsourcing upon BLS Productivity

The Bureau of Labor Statistics (BLS) has completed several studies that give further insight into the effects of offshoring on the United States. These include a study on the consequences of offshoring for the service sector labor market, the level of concern that should exist about offshoring IT functions, and an analysis of how offshoring may affect BLS productivity measures. The first study, Service-providing occupations, offshoring, and the labor market, examined 160 service occupations that are susceptible to offshoring. The occupations varied in job function, necessary education and wages. The list of 160 occupations was arrived upon by eliminating all service oriented occupations that require face-to-face interaction or are required to be performed in a specific location. The remaining occupations were determined to be susceptible to offshoring and were ranked according to level of susceptibility [11].

Of these occupations, 33 were high rank positions, 94 are middle ranked positions and 33 were low ranked positions. In 2007, the high ranked occupations accounted for 9.5 million jobs, the middle ranked accounted for 14.4 million jobs and the low ranked accounted for 6.5 million jobs. The article does not attempt to describe the effects of offshoring; however it does mention that the service occupations that are susceptible to offshoring grew at a rate that was slightly faster that all service providing occupations from 2001-2007 and are expected to continue to do so through 2016 [11].

The second study restructured offshoring of Information Technologies (IT) as a concern. It states that technology has long been integral to the growth of the United States’ economy and the contribution of IT to the economy doubled between the years 1970 and 2000. The study presents evidence that private imports and exports, such as a company developing a computer program overseas and implementing it on a United States based computer system, are rising. Although these types of imports and exports are increasing, they do not make up a large segment of the IT sector. The study concludes by stating that the job losses that do occur in the IT sector as a result of offshoring fall into two categories. Direct job losses are the result of offshoring. Indirect job losses are the result of the productivity enhancements that offshoring provides [12].

The final study, The Effect of Outsourcing and Offshoring on BLS Productivity Measures, addresses concerns that outsourcing and offshoring have hidden influence in BLS productivity measures. The study examines the origin of the information used to generate the productivity measures and the effect that outsourcing and offshoring may have. Productivity measures for the sectors of business and nonfarm business and well as manufacturing are examined [13]. Offshoring is determined to have little to no influence on productivity measures in the business and nonfarm business sector. The effect of offshoring is pronounced in the manufacturing sector. If finished goods are created in the United States with intermediate parts from overseas, the labor productivity rate will be higher than if the intermediate parts were produced domestically. Although this influence does exists, it only accounted for 1.5% per year of sectorial output per hour growth through 1995 and only 1% thereafter [13].

3. Issues of Outsourcing

Companies choose to outsource for many reasons. The Outsourcing Institute [14] identified several reasons for outsourcing. The first reason given is the reduction and control of operating costs. Other reasons listed include those that allow the company to use its internal resources to focus on core competencies and to take advantage of resources that the company itself does not have access to [14]. Labor cost in particular is often cited as a motivation for outsourcing. The average wage of a factory employee in the United States was $21.11 in 2002. The average compensation in 30 countries that the Bureau of Labor Statistics monitors for competitiveness was only $14.22. This 32% difference demonstrates how strong of a motivation cost reduction can be [15]. Moreover the assumption of getting lower cost by locating outside of the United States is changing. In 2003, labor cost in the 30 countries that the Bureau of Labor Statistics monitors for competitiveness rose by 12%. In the United States, labor cost rose by only 4%. If this difference remains constant, the United States will become the low cost labor provider [15].

There are also factors that may discourage offshoring and motivate a company to reshore processes that it had previously outsourced. The reasons that Boston Consulting Group gave were labor cost, product quality, ease of doing business and proximity to customers [10]. The first reason, labor cost, has already been discussed. Labor cost is rising rapidly in many countries but remaining relatively stable in the United States. The BCG study found that 92% of those
surveyed believed that labor costs in China would continue to rise [10]. This is a major issue to labor intensive industries. Companies are more likely to outsource labor intensive work from a location having cheaper labor cost. However labor cost may be of less concern to automated manufacturing facilities.

The next reason that companies consider reshoring is product quality. It is possible that the companies wish to have greater oversight and therefor increased product quality by locating facilities nearer to the home office [16]. The quality of product depends on expertise & technology which may be / not be available in same locations. The situation varies for individual product. For greater quality of product and service, companies either reshore or offshore. Companies are discovering that by offshoring, they are having increased instances of defects, delays and theft of trade secrets. In a sector that is highly dependent upon accuracy, some companies are willing to pay a premium to avoid offshoring and assure a quality product [17].

The third reason is ease of doing business. When selling within the market where products are manufactures, companies do not have to contend with import regulations that they would have to if they utilized foreign manufacturing facilities. In addition to this, it may be easier to coordinate with domestic partners due to cultural commonalities and similar time zones than with those located on the other side of the globe [16]. The globally dispersed facilities can be easily affected by the local & international politics along with natural calamities across the world. Demand uncertainty and larger lead time worsen the situation. So, managing physically dispersed supply chain is much more tough & complex. To many companies, centralized facilities/functions provide ease of management. Thus ease of doing business may be affected by reshoring / outsourcing strategy. The final reason for reshoring given by the BCG study is proximity to customers. By locating manufacturing facilities in close proximity to the customers who desire to purchase a company’s goods, a company has better access to its market. Goods may arrive to a customer in a shorter amount of time which will increase customer satisfaction [16].

Offshoring is especially problematic in the high-technology sector. There are risks of technology transfer. Charlene Begley, chief information technology officer of GE, stated “We lost a lot of the technical capabilities that we have to own [18]. In case of offshoring, trade secrets may be stolen. Due to such reasons, some companies are willing to pay a premium to avoid offshoring [17]. Moreover, companies related with defense should not feel comfortable with reshoring due to having potentiality of risk of leaking confidential defense information.

A lack of customer satisfaction and low levels of customer retention of companies that outsource compared to companies that operate domestically may also encourage companies to reshore. In the case of call centers, customers rated those that were perceived as being located outside of the United States 26 points lower than those within the United States. The primary reason given is that the percentage of problems resolved by the outsourced centers is significantly lower than those that were not outsourced. It is suggested that this problem is due to linguistic differences that result in the customer having difficulty understanding the representative [19].

Tax implication, incentive/subsidy etc. may also motivate companies to reshore. 70% of Chief Financial Officers (CFO) surveyed responded that the proposed permanent R&D tax credit in the United States would positively impact their company [6]. State and local governments also impose taxes and grant incentives. State governments within the same country may even vie with one another for that chance to host a company within its borders. For example, Michigan state officials have offered more than $60 million over 12 years in incentives to GE [18]. Moreover some industries like contact centers may soon have a great incentive to reshore. Recently proposed legislation stands to require companies that utilize offshore contact centers to be able to transfer all customer calls to a domestic representative upon request. The bill, known as the US Call Center Worker and Consumer Protection Act, also bans companies that use offshore contact centers from receiving federal grants and loans [20].

Favorable tax policies are not the only financial reshoring driver. A survey by BDO USA, LLP found that 45% of CFO’s felt that the Financial Accounting Standards Board’s (FASB) recent rule changes regarding revenue recognition would have a positive impact on their company. The same study found that manufacturing is the most frequently outsourced function, followed by IT services. The fact that nearly half of all surveyed CFO’s believe the new FASB rule changes regarding revenue recognition will positively affect their company may lead to these functions returning to the United States [6]. There are also some national and international policy regulations which induce complexity to international businesses as well as outsourcing strategy.
Customer retention may also be a driving force for reshoring. Many times, customers are more likely to remain with domestic companies than with foreign companies. The reason behind may be some good perception about own country, patriotism, branding etc. There is also another issue of associated logistics cost which affects the reshoring strategy. If various facilities are far located, then both inbound and outbound logistics cost will be increased. As fuel price is raising day by day, shipping cost including other logistics cost is becoming a major concern. There is also a trade-off between logistics cost and other associated (fixed & variable) cost. So logistics cost is a major issue for companies to take sourcing decision. Based on the reason discussed above, several factors that may drive a company to reshore are listed in following table 2.

<table>
<thead>
<tr>
<th></th>
<th>Customer retention</th>
<th>Ease of doing business</th>
<th>Policy regulations</th>
<th>Labor cost</th>
<th>Logistics cost</th>
<th>Product quality</th>
<th>Proximity to customers</th>
<th>Tax (federal &amp; state) implication, Incentive/subsidy etc.</th>
</tr>
</thead>
</table>

4. Literature Review

There is a disagreement about the sustainability of the current practice of outsourcing. Aron and Singh discuss the fact that many companies make poor outsourcing decisions. They cite that 50% of offshoring contracts executed between 2001 and 2004 will not meet expectations. They state that executives are not good at distinguishing which core competencies are suitable for outsourcing [21].

On the other hand, Agrawal and Farrell present evidence that offshoring is not hugely detrimental. They state that 70% of services jobs in the United States are jobs that cannot be relocated overseas, and that the jobs that are lost are part of the ongoing economic restructuring process. They also discuss the ways in which offshoring produces value for the United States [22]. Brown and Siegel present further evidence that the majority of jobs remain in the United States. They do this by analyzing data released through a partnership between the states and the Bureau of Labor Statistics. The data was the result of employer surveys about mass layoffs [23]. The results showed that 70% of relocation efforts took place within the United States and 80% of relocation efforts involved the same company performing the functions, just in a new location. When work was transferred to a different company, work was transferred to another country 40% of the time. Mexico and China accounted for over half of the efforts to relocate outside of the United States [23]. Offshoring is projected to account for only 25-35% of all outsourcing in 2013. The remaining percentage will be accounted for by nearshoring and work at home agents [19].

Aron and Singh state that outsourcing exists on a continuum with all processes performed in-house on one end and all outsourced on the other [21]. It is important to acknowledge this fact. It may be in a company’s best interest to reshore all of its processes; but, for some companies, reshoring only some functions may be the best option. Archstone Consulting’s 2009 survey revealed the fact that 60% of manufacturers ignore 20% of the cost of offshoring. To improve this situation, Reshoring Initiative provides software to make a relative judgment of the cost of offshoring and domestic sourcing [24].

There is not currently a model that can predict what functions or services should be returned to the United States. Although not a formal model The Boston Consulting Group has identified several sectors to be closer to a cost tipping point from China to USA [10]. The construction of such a model could greatly aid companies in making better sourcing decisions. This paper aims to build up such model to suggest whether a specific type of companies should reshore or not. To develop the model Multi Criteria Decision Making (MCDM) technique has been used which enables people to make the most appropriate choice among many criteria and it is a widely used concept [25-27]. AHP is one of them. It is the best suited for conversion of linguistic variable to quantitative value. The methodology is developed by Saaty.
The most attractive is the pairwise comparison which enables to calculate the relative quantitative priorities among various complex alternatives in an intuitive manner.

The stepwise procedures of AHP according to the prescribed theory by Saaty are described as follows [29, 32]. At first, a hierarchical structure of the problem has to be developed. After that pair wise comparison matrix among all of the criteria in the same level of the hierarchy is developed. The comparison is done based on a specified scale of importance.

After constructing pairwise comparison, Saaty [29] suggested to solve it for the eigenvector (Equation 3, 4). The weightage for the comparison matrix at the criteria level is calculated too (Equation 1, 2). After that consistency ratio of the matrix is also checked (Equation 5, 6). Regarding consistency, in the pairwise comparison matrix, perfect consistency is neither expected nor required for AHP. But it has to be within acceptable limit [29]. Cay & Uyan [33] stated that, “CR reveals the random probability of values being obtained in a pair-wise comparison matrix.” The consistency ratio (CR) must be less than 10%. Consistency ratio is the ratio between consistency index (CI) and average consistency index or random index (RI). Consistency Index (CI) is a measure of consistency [29].

The above discussed steps have to be repeated for all descending levels of the hierarchy. After that, the weightage value at the sub-criteria is multiplied by the corresponding weightage at criteria level. Finally an aggregate matrix is formed by adding the weightage with respect to each of the criteria which may be referred to as global weightage.

AHP can be programmed by using various mathematical software. In this paper, a spreadsheet has been used to develop the template. This paper aims to analyze the decision making regarding ‘Reshoring’ through the use of AHP.

5. Methodology and Survey Results
A formal model is needed to be developed to analyze the reshoring factors. Analytical hierarchy method has been used in this research to make decision regarding reshoring. The observed methodology is described stepwise below.

Step 1: At first, the decision criteria need to be identified. Therefore, driving factors that influence to shift functions towards the USA have been identified (Table 2).

Step 2: In this step, user’s opinion based on each criteria have to be identified. For that purpose, a questionnaire [34] has been developed. The objective of the questionnaire is to determine the relative priority between Re-shoring (to shift function towards the USA) and off-shoring/out sourcing (to keep operations in other countries) based on each factor. A sample question looks like - “Existing policy regulations (domestic & international) encourage reshoring”. Answering options were ‘Strongly Agree’, ‘Agree’, ‘Agree Somewhat’, ‘Undecided’, ‘Disagree Somewhat’, ‘Disagree’, ‘Strongly Disagree’. In the questionnaire [34], users were asked to select a qualitative answer. For the calculation through AHP, a scale of relative importance has to be formed where the ‘equal’ importance and neutral/undecided opinion corresponds to a value of 1. In this paper, 1-4 scale has been used for calculation through AHP (Table 3).

<table>
<thead>
<tr>
<th>Level of importance</th>
<th>Corresponding Value (Scale of relative importance)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extreme</td>
<td>4</td>
</tr>
<tr>
<td>Strong</td>
<td>3</td>
</tr>
<tr>
<td>Moderate</td>
<td>2</td>
</tr>
<tr>
<td>Equal</td>
<td>1</td>
</tr>
<tr>
<td>Inversely Moderate</td>
<td>1/2</td>
</tr>
<tr>
<td>Inversely Strong</td>
<td>1/3</td>
</tr>
<tr>
<td>Inversely Extreme</td>
<td>1/4</td>
</tr>
</tbody>
</table>

Step 3: In this step, the relative priority based on each factor is determined. By using the input value from the questionnaire, relative weightage of reshoring and offshoring based on each driving factor is determined. The output weightages are the local weightages of reshoring vs. outsourcing (Table 4).
Table 4: Comparing reshoring vs. offshoring/outsourcing based on each driving factors

<table>
<thead>
<tr>
<th>Driving Factors</th>
<th>Shifting function towards USA (Reshoring)</th>
<th>Remain functions in other Country (Offshoring)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Customer retention</td>
<td>2</td>
<td>0.5</td>
</tr>
<tr>
<td>Ease of doing business</td>
<td>3</td>
<td>0.333</td>
</tr>
<tr>
<td>Policy regulation</td>
<td>2</td>
<td>0.5</td>
</tr>
<tr>
<td>Difference in Labor cost</td>
<td>0.333</td>
<td>3</td>
</tr>
<tr>
<td>Logistics cost</td>
<td>4</td>
<td>0.25</td>
</tr>
<tr>
<td>Product quality</td>
<td>2</td>
<td>0.5</td>
</tr>
<tr>
<td>Proximity to customers</td>
<td>4</td>
<td>0.25</td>
</tr>
<tr>
<td>Tax(federal &amp; state) implication, Incentive/subsidy etc.</td>
<td>0.333</td>
<td>3</td>
</tr>
</tbody>
</table>

**Step 4:** In this step, the relative pairwise priority among various criteria have to be determined. It should be a pairwise comparison among all factors of same level. Another set of questions [34] is also developed for this purpose. It aims to compare relative importance level among all the chosen driving factors. All the options in the answer to question are structured in such a way so that it may express the relative importance of one driving factor with respect to another. The linguistic options vary from question to question but all refers to relative importance. A typical question from this set is as follows- “Between ‘logistics cost’ & ‘labor costs’ which one affects your strategic decision making more?” Answering options were ‘Logistics cost affects extremely’, ‘Logistics cost affects strongly’, ‘Logistics cost affects moderately’, ‘Both affect equally’, ‘Labor cost affects moderately’, ‘Labor cost affects strongly’, ‘Labor cost affects extremely’

**Step 5:** Based on the output of step 4, normalized weightage of the criteria have to be calculated. The output of the 2nd set questionnaire is the pairwise comparison matrix among all the driving factors (Table 5). From the comparison matrix, the geometric mean ($b_i$) and normalized weightage ($x_i$) is calculated.

$$b_i = \left( \prod_{j=1}^{n} a_{ij} \right)^{1/n} \quad (1)$$

$$x_i = \frac{b_i}{\sum b_i} \quad (2)$$

Table 5: Pairwise comparison among various factors
**shaded portion is the reciprocal of the other part along diagonal**

**Step 6:** The consistency ratio (CR) of the pairwise comparison matrix (Table 5) is checked whether it is within required limit (CR ≤ 0.1) or not. Where CI = consistency index, n = number of compared alternatives, λ = a constant known as eigenvalue, and $\lambda_{max} = n$.

\[ y_j = \sum x_{ij} \]  
\[ \lambda_{max} = \sum x_i y_j \]  
\[ CI = \frac{(\lambda_{max} - n)}{(n - 1)} \]  
\[ CR = \frac{CI}{RI} \]  

**Step 7:** Considering both set of local weightages, finally global weightages are calculated. From table 6, global weightage for reshoring and offshoring have been obtained. This gives us a relative priority weightage for a specific function of a company.

Table 6: Calculating global weightage of reshoring for a power transformer manufacturing company

<table>
<thead>
<tr>
<th>Reshoring factors</th>
<th>Customer retention</th>
<th>Ease of doing business</th>
<th>Policy regulation</th>
<th>Labor cost</th>
<th>Logistics cost</th>
<th>Product quality</th>
<th>Proximity to customers</th>
<th>Tax implication, Incentive</th>
<th>total score</th>
<th>Priority (normalized)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weightage</td>
<td>0.109</td>
<td>0.148</td>
<td>0.037</td>
<td>0.0998</td>
<td>0.173</td>
<td>0.224</td>
<td>0.154</td>
<td>0.055</td>
<td></td>
<td></td>
</tr>
<tr>
<td>USA</td>
<td>2</td>
<td>3</td>
<td>2</td>
<td>0.333</td>
<td>4</td>
<td>2</td>
<td>4</td>
<td>0.333</td>
<td>2.544</td>
<td>0.765</td>
</tr>
<tr>
<td>Other country</td>
<td>0.5</td>
<td>0.333</td>
<td>0.5</td>
<td>3.003</td>
<td>0.25</td>
<td>0.5</td>
<td>0.25</td>
<td>3.003</td>
<td>0.78</td>
<td>0.235</td>
</tr>
</tbody>
</table>

**Step 8:** Step 3, 5, 6 & 7 are repeated for all the different users participated in the survey (Reshoring Questionnaire, 2013).

The calculation gives a reliable priority of reshoring vs offshoring for a specific industry/company/function. Based on this data, all other company of same type may take decision regarding whether they should reshore or remain offshore.
6. Discussions
A total of eleven companies participated in the survey. The companies include heavy manufacturing like shipbuilding, power transformer manufacturing, chemical manufacturing, glass manufacturing, office supplies merchandise etc. Table 4, 5 and 6 shows the priority rating of reshoring for a power transformer manufacturing company. From table 4, it is seen, the company considered logistics cost and proximity to customers as an extreme factor that drives towards reshoring. Moreover, it is noticed (table 5) that the same company gave greater weightage on quality of products (22.4%), logistics cost (17.3%) and proximity to customers (15.4%). Finally, the overall priority on reshoring came 76.5% (Table 6).

Other companies like shipbuilding shows a priority of 77.5%, chemical manufacturing shows a priority shows 82.8%, office supply distribution shows a priority of 70.6% on reshoring. From these several data, a tendency towards reshoring is noticed. One common characteristics of these companies’ strategy was to give higher weightage on quality of products and most of them gave higher rating to reshoring based on quality. Some companies (shipbuilding, power transformer, chemical company etc.) found the policy regulations to be favorable towards reshoring while companies like glass manufacturing found it to be favorable towards offshoring. One another characteristics is that the companies who took part in the survey were not labor intensive, therefore, they gave less weightage on labor cost. Proximity towards customers also plays a significant role towards reshoring. The surprising fact may be that, even after proving higher priority on reshoring, many of the companies are still practicing offshoring. The reason may be bureaucratic decision making. Though it is hopeful that the power transformer manufacture who used to outsource core clamps, fans, electrical steel etc. from overseas, are now planning to reshore electrical steel.

7. Conclusion
This paper identified various driving factors and their effects upon the reshoring decision. At present day most of the business factors promote reshoring, while some of the factors like cheap labor cost and quality of products may lead toward outsourcing from overseas. Quality of products can be easily ensured by hiring technical expertise. While considering other hidden costs associated with cheap labor influence the business personnel to make the decision to reshore their operations. The federal regulations and tax incentive also play significant role to influence reshoring.

Moreover, the discussed Multi Criteria Decision Making (MCDM) approach can help the decision maker to reveal the actual trend and priority settings of their business strategy.

References
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