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Research Report: ZLC-2013-9
Developing a Supply Base Rationalization Tool for a Global Organization
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Developing a Supply Base Rationalization Tool for a Global Organization

By Siddharth Sharma & Richard Swapp

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Summary:

This thesis analyzes the supplier base for a leading oil and gas service provider. We create a scalable tool to guide procurement decisions in the presence of an inflated supply base while making recommendations for a rational supplier base and delivering a tool to dynamically assess risks and costs.

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KEY INSIGHTS

1. The supplier base must be agile when operations are continuously changing geographic locations.

2. Geographic risks can be mitigated by moving from a consolidated supply base to one with greater diversification.

3. There is not an optimal number of suppliers for any one company. Instead, suppliers must constantly be evaluated in order to meet organizational objectives.

Introduction

As companies begin to recognize significant benefits associated with efficient operational processes, weaknesses within the supply chain become more evident than previously realized. However, when the weakest link resides outside the firm, it may lead to significant problems. This is true with regard to a company's supply base. It is critical for a company to monitor and manage its supply base to ensure smooth operations and profitable results. The issue of managing suppliers becomes a major challenge when the company has global operations, billions of dollars in purchases, and a history of mergers and acquisitions. The problem becomes more challenging when an imbalance exists between the revenue and the number of suppliers within a given region. As operations shift from one geographic location to another, the supply base must respond dynamically by expanding in areas of growth and contracting in areas of decline.

The problems of a supply base with such magnitude are many. First, a strong buyer-supplier relationship, which is fundamental to the success of the business, is negatively impacted. Second, the supplier relationship managers are over-burdened, which affects staff productivity. Third, and more importantly, the company incurs an opportunity cost from not being able to take full advantage of economies of scale. In addition, by nature of the Oil and Gas industry, operations are located in risky areas around the globe. As such, geographic and operational risks must be accounted for in procurement decisions.
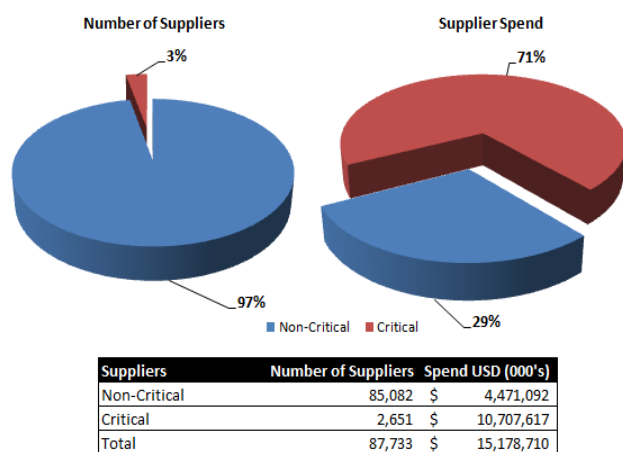
A spend analysis is the first step towards supply base reduction (Aberdeen Group, 2004). Once the spending habits of the company have been assessed it is possible to identify elimination criteria. Ogden et

al (2003) indicate three plausible approaches to elimination including systematic elimination, standardization, and tier-formation. However, in many cases the supply base is actually too small to support operations. This is particularly true in high-growth regions. As such, Duffy (2005) suggests segmenting suppliers based on volume and value. Creating a quartile graph allows category level strategies to be developed. However, the company of interest ("The Company") also has to operate in risky regions. In this thesis, we combined risk scores from the United Nations and The Economist Intelligence unit and plotted these against the ratio of number of non-critical suppliers to critical suppliers. This plot, shown on page 3, clusters supplier sub-categories and allows for analysis to indicate when a specific commodity should be diversified or consolidated.

Using this framework, we evaluated each supplier category and every region where The Company has operations. Through this process we were able to identify suppliers to be eliminated and regions where suppliers are needed to sustain operations.

Analysis and Strategy

As defined by The Company, a critical supplier, among other criteria, is one that accounts for 70% of spend within a category. As such, spending was expected to be concentrated with critical suppliers. This was verified in the spend analysis. However, it was found that 97% of all suppliers are non-critical.

| Suppliers	Number of Suppliers	Spend USD (000's)
Non-Critical	85,082	$ 4,471,092
Critical	2,651	$ 10,707,617
Total	87,733	$ 15,178,710

The figure above shows that only 3%, roughly 3,000 suppliers, are listed as critical to operations of The Company. This suggests there is significant potential for supplier reduction, as spend with non-critical suppliers does not represent a majority of total spend within any given category. Consolidation can help The Company develop stronger relationships with fewer suppliers and negotiate better contracts.

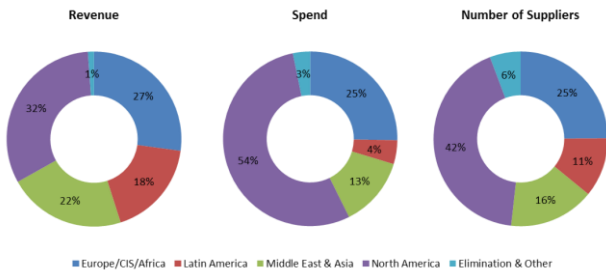The spend analysis found that 86% of total spend is managed by local managers. Based on this finding,

an analysis was conducted to understand how well different management models managed their supplier portfolio. The Supplier Management Progress (SMP) is a pre-defined process in The Company that, at a very high level, can be used to describe the strength of relationship The Company has with a particular supplier. The table below shows that local managers have the lowest overall percentage of the SMP complete in both non-critical and critical supplier categories.

| Mgt. Models	No. of Suppliers	Avg. SMP (%)
Non-Critical	85,081	5%
Center-Led	302	70%
Centralized	403	42%
Coordinated	10,349	11%
Local	74,027	4%
Critical	2,651	41%
Center-Led	191	52%
Centralized	352	75%
Coordinated	951	39%
Local	1,157	30%

The percentage SMP is used to calculate managed-spend, which is a KPI for procurement managers at The Company, measured by multiplying spend with the percentage SMP. The figure below illustrates the issue with SMP at The Company. Over 79,000 suppliers have completed less than 10% SMP, yet these suppliers account over $3b in annual spend.
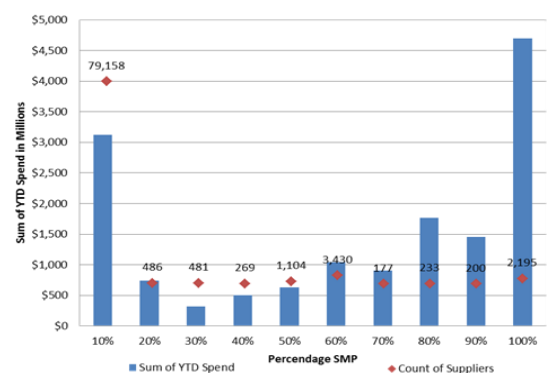
Revenue data was gathered from The Company's 2012 Annual Report to compare the percentage of suppliers and the percentage of revenue per geographic region. It was found that suppliers in North America represent 42% of all suppliers; however, only 32% of revenue is generated within North America. The figure below illustrates the imbalance of this relationship across all geographies.

Revenue | Spend | Number of Suppliers

- Europe/CIS/Africa ■ Latin America ■ Middle East & Asia ■ North America ■ Elimination & Other

Supplier rationalization will require The Company to evaluate the effectiveness of the procurement team. Questions arise such as how many suppliers each manager oversees and how much spend can each manager efficiently handle. The figure below shows that currently 80% of total spend is managed by 23% (123 managers). This means 411 managers handle 20% of total spend. Currently, managers are achieving an average SMP of 25% and only 811 suppliers have an audit date listed. This suggests that the system could be made more efficient through restructuring or redistributing the workload.
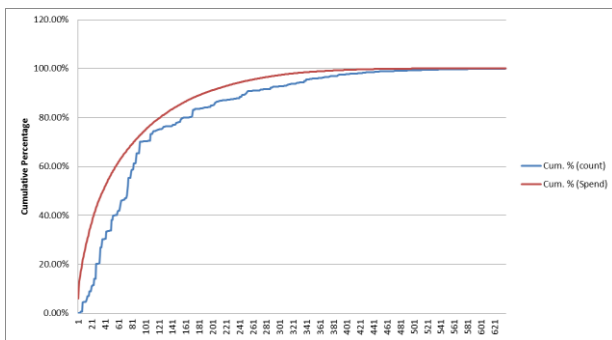
Segmentation

Following the strategy outlined by Duffy (2005), supplier categories are segmented using a quartile graph as shown in the figure below.

For The Company, Volume was based on spend within a specific category and Value was determined based on indirect (low value) or direct (high value) segmentation. The Company segments supplier categories based on direct and indirect spend; these segments were readily transferred to our model. After clustering supplier categories based on volume, spend per category was determined. Categories with spend greater than the company average were identified as high volume and categories with spend less than the average were identified as low volume.

Risk

To incorporate the idea of risk into the model, two numerical risk scores were incorporated. The first came from The Economist, which ranks countries from 0 to 100 (100 = most risky) based on security, political stability, government effectiveness, legal and regulatory, macroeconomic, foreign and payments, financial, tax policy, infrastructure, and labor market (The Economist, 2011). These are risks associated with operating a business within a particular country. The second risk score was obtained from United Nations World Risk Report, which quantifies a country's vulnerability to a natural disaster and the country's ability to respond (United Nations University, 2011). These scores were combined using the following equation.

$$\textbf{Combined Risk Score} = \textbf{EIU} * (\textbf{1} - \textbf{UN})$$

Where,

EIU = Risk Score obtained from The Economist Intelligence Unit

UN = Risk Score obtained from the United Nations University

The UN risk score is measured in percentage and has a maximum value of 32%. So that the combined risk score is not reduced to an insignificant numerical value, EIU is multiplied by the residual UN score (1-UN). The combined risk score allows the risk of a disruption to be quantified.

Number of Non-Critical Suppliers divided by Number of Critical Suppliers

The figure above shows the quartile graph with risk on the y-axis and the ratio of non-critical suppliers to critical suppliers on the x-axis. The horizontal line dividing the graph to upper and lower sections is the average risk score for category across all geographies. This represents an internal benchmark. The vertical line dividing the graph should be 1.00 meaning sub-categories with more non-critical suppliers than critical suppliers are diversified.

Tool Development

The objective of developing the procurement tool was to provide clear and concise information, via a simple-to-use graphical user interface, that would

empower the procurement team to make both strategic and operational decisions that reduce costs and increase efficiency.

The key inputs were identified as the supplier country and the product category. In order to provide a macro vs. micro-level assessment of the spend dynamics a "select all" option was included for both inputs. Additionally, provision was made to allow the sourcing managers to evaluate the Key Performance Indicators at the GeoMarket level.

The tool is designed to combine industry best practices, The Company's procurement strategy, and the current state of key performance metrics in terms of providing outputs to the sourcing managers.

Findings and Recommendations

Nearly 51% of suppliers for The Company realized zero revenue during the first three quarter of 2012. These suppliers should be immediately marked for elimination. Further, for indirect categories such as Travel and HR services, more than 30% of the suppliers had no associated spend during the period under study. Procurement in indirect categories should be consolidated to take advantage of economies of scale. While many categories represent an opportunity to reduce the supplier base, some, such as chemicals, have a relatively low number of suppliers (1% of total) and are already well consolidated.

In general, for The Company, nearly every supplier category suffers from having dormant suppliers resulting in a diversified supply base. Opportunities exist to eliminate non-critical suppliers in low-risk regions. This will enable The Company to consolidate spending and negotiate better contracts with the remaining suppliers. While evaluation of suppliers as well as volume allocation will be left to the individual procurement manager, this work will guide managers to categories and countries where this type of rationalization is deemed necessary. A tool assessing how to allocate volume under a dual sourcing scenario could serve as an extension of this research. Rothkopf & Pibernik (2012) document this problem very well.

The Company, by the nature of its business, operates in locations with high geopolitical risk. However, there are ways to reduce risk and by segmenting suppliers, The Company should develop a strategy to reduce the risk of disruptions by looking for more stable suppliers in risky countries and by sourcing from less risky neighboring countries.

Initially, the procurement tool will call for aggressive cuts to the supply base in most regions. This will provide for a reallocation of volume to the remaining suppliers and position The Company to leverage lower prices and more standardized service. Further, with fewer suppliers, The Company will face a tradeoff between (1) Maintaining the same number of managers and attempting to increase supplier performance monitoring and (2) reducing the number of managers and maintaining current performance monitoring standards.

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