WINDS OF CHANGE AT MEASUREMENT EQUIPMENT SUPPLY COMPANY, INC.

Teaching Note

Case Overview

The Winds of Change case presents a strategic decision for a distributor of oil and gas measurement equipment. Bill Smith was the long-time owner/operator/CEO of Measurement Equipment Supply Company, Inc. (MESCO), a distributor of pressure, flow, and temperature measurement equipment for the oil and gas industry in West Texas and eastern New Mexico. A recent phone call from an equipment manufacturer brought urgency and clarity to Smith's situation. This manufacturer wanted to cut MESCO out of the supply chain and deal directly with MESCO's customers. Bill must now decide the best response to this problem, including the use of information technologies to improve operating efficiencies and thus remain a viable competitor in the industry's distribution network.

Learning Objectives

The objectives of this case are that students will:

1. Understand the role of distribution in supply chains.
2. Distinguish between logistics-intensive distributors versus product knowledge-intensive distributors.
3. Assess the impact of disruptive technologies that change business processes and alter the face of competition in an industry.
4. Analyze the possible role of information technologies in competitive positioning and managing change.
5. Summarize common problems in implementing an enterprise resource planning (ERP) system.

Suggestions for Classroom Use

This case is intended for use in undergraduate courses in operations and supply chain management. It is also useful for courses in ERP, MIS, and other enterprise systems, logistics, distribution management and marketing.

Research Method

The information in this case is disguised at the request of the owner of the company represented in the case. Extensive interviews were conducted to gather information around the nature of the company and the issues and concerns expressed by the owner. Although the information provided in the case is true and properly presented for consideration by the student, the name of the company, the owner, employees, and other stakeholders have all been changed to protect the identities of everyone involved.

Relevant Literature

The following literature discusses many of the issues presented in this case as it relates to operations and supply chain management, logistics, information technologies, and Enterprise Resource Planning systems. These readings are suggested to gain a deeper appreciation of the challenges set forth in this study.

1. Bowersox, D. J., Closs, D. J., & Cooper, M. B. (2010). *Supply chain logistics management* (3rd ed.). McGraw-Hill Irwin: New York.

2. Closs, D. J. (2007). How can supply chain information technology enhance competitiveness? *Logistics Quarterly*, 14(4), 10-11.

3. Founou, R. (2002). The role of IT in logistics: competitive advantage or strategic necessity? *2nd Swiss Transport Research Conference* (pp. 20-22). Monte Verita, Ascona.

4. Lawrence, F. B., Jennings, D. F., & Reynolds, B. E. (2005). *ERP in distribution*. Thomson, South-Western: Mason, OH.

5. Magal, S. R., & Word, J. (2011). *Integrated business processes with ERP systems*. John Wiley & Sons: New York.

Discussion Questions

The following questions can be used in guided discussion to address the issues presented in the case:

1. What value does a distributor such as MESCO provide to both its customers and its suppliers?
2. How are product knowledge intensive distributors different from logistics intensive distributors?
3. Is the Internet considered to be a disruptive technology in the distribution industry? What other industries have faced a similar challenge?
4. How would an enterprise resource planning (ERP) system help MESCO?
5. What challenges will MESCO face in implementing or not implementing an ERP system?

Discussion Questions and Suggested Responses

1. What value does a distributor such as MESCO provide to both its customers and its suppliers?

Beyond the basic movement of goods from point to point, the process of distribution and order fulfillment plays an important role in supply chains (Coyle et al., 2009). The fundamental problem that distribution solves is the disconnect with respect to time, location, and quantity between the manufacturing of goods and their demand from retail businesses or individual consumers. In today's global economy, most goods are produced in large quantities at a global supplier. So, how do you connect items that are produced in large quantities, requiring several weeks to produce and ship from locations far away, to individual consumers all over the world who want a quantity of one (1) of something, where they are located, and need immediately or in 1 to 3 days shipping time? The answer to this mismatch is distribution. Distributors serve to

convert the time/location/quantity parameters of the manufacturing and agricultural producers to those of individual consumers and retail stores.

Figure TN-1 illustrates the "spider web" of transportation routes and buying/selling relationships without and with a distributor intermediary between the factories and the retail stores (Bowersox, 2010). While distribution centers are costly to operate (e.g., staff, facilities, insurance, utilities, IT systems), they serve to simplify and reduce the transportation miles required, and perhaps even more importantly, serve to reduce and simplify the number of buyer/seller relationships that must be managed. In that respect, distributors provide value for both their upstream manufacturing suppliers and their downstream customers. Figure TN-2 also provides a conceptual process flow for the activities within a distribution center.

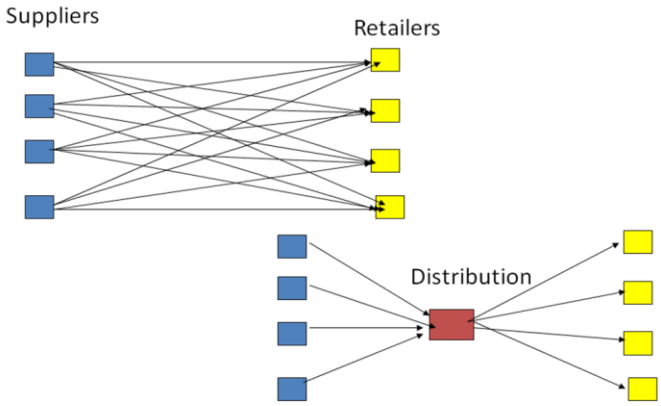

Figure TN-1. Transportation Network and Buying/Selling Relationships Without and With Distribution

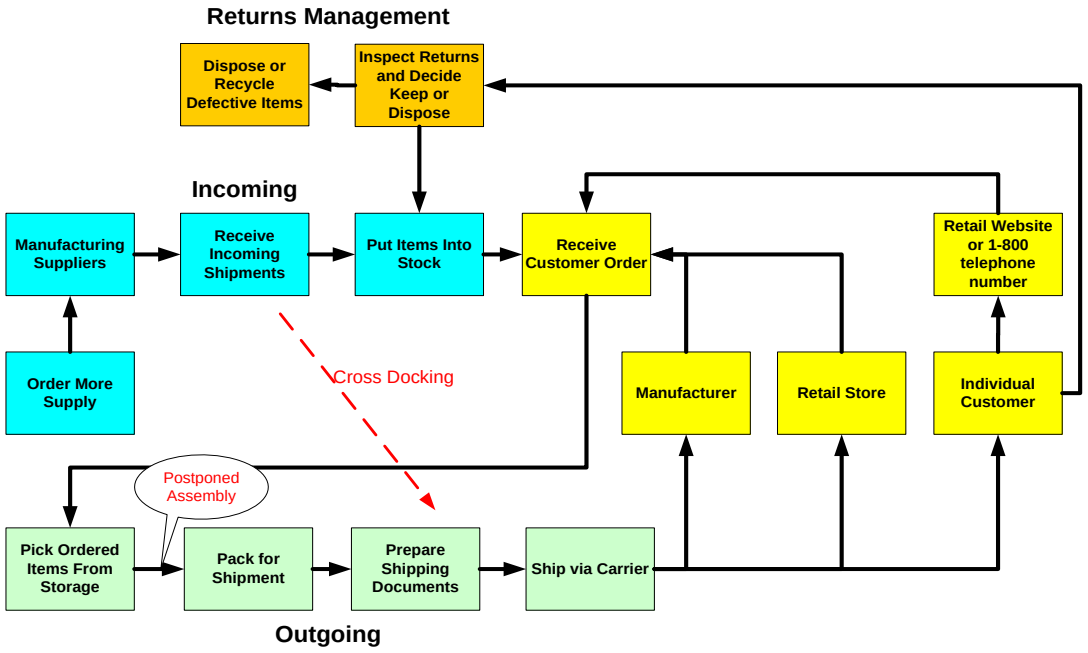

Figure TN-2. Overview of Distribution Center Operations

The processes are composed of the following:

- Incoming Goods – process of receiving, inspecting, and storing (put away) of goods from manufacturing suppliers. In the case of a cross dock, received items are not put away into storage, but rather re-sorted by outgoing destination and shipped out, hopefully the same day.

- Outgoing Goods – process of filling orders by picking items from storage, packing and shipping via a carrier. In the case of postponed final assembly of product options, these are performed at this point, depending on which configuration was ordered by the customer.

- Customer Interface – process of receiving orders from manufacturers, retail stores, or individual consumers by telephone call center, web site, or other.

- Returns Management – process of receiving customer returned items and deciding whether to repair and ship back, keep and restock, recycle or dispose, or return to manufacturer.

Many distribution centers have significant investments in materials handling equipment such as conveyors to move items to and from storage and high-rise cranes to store and retrieve items from high-rise storage racks. Other technologies used include extensive use of bar codes or RFID tags to identify items and storage rack locations to help ensure order fulfillment accuracy; put-to-light or pick-to-light which provides the employee a visual lighted signal to provide assurance of an accurate storage location for putting away or picking to fill an order; and scales to provide a weight check on packages - actual weight versus expected total package weight, based on the expected weights of items on the pick list ordered by customers.

Thus, distribution centers (DCs) provide the same value to retailers that retailers provide individual consumers:

- Lead time shortening – retailers can get quicker deliveries from the distribution center than directly from manufacturers.

- Purchase quantity reduction – retailers can order small quantities. Manufacturers prefer to produce and ship large quantities to distributors.

- Purchasing simplification – “one stop shopping” for retailers for certain types of items.

- Product knowledge – in some cases, the distributors are experts in certain families of products.

Besides these functions, DCs also serve to:

- Change Shipping Quantity – either “make bulk “ (consolidating smaller quantities of items into a big quantity for transportation purposes) or “break bulk” – (separating big shipments into smaller ones),

- Store inventory – because of uncertainty or seasonality in supply and/or demand, and

- Reduce Costs - reduce transportation costs.

A firm (either a manufacturer or a retailer) must decide whether to own its own distribution centers, use a publicly available distribution center which serves multiple customers, or utilize a contract distribution center service provider, commonly known as a third party logistics provider (3PL) – a firm that provides logistics services to customer companies for a portion or all of their supply chain management activities (Lawrence et al., 2005; Bowersox et al., 2010).

Using third party distributors provides several advantages and areas of expertise for both manufacturers and retailers, including the following:

- Opportunity to convert costs that are typically assigned as fixed costs for a manufacturer or retailer into variable costs when managed by a logistics provider
- Reduced costs because of third party order fulfillment firm's economies of scale – facilities, staff, systems, freight rates, packing materials
- Better information systems integration
- In the case of specialized distributors, deep knowledge of a particular industry
- Value-added services such as postponed final assembly of products with options, returns management and product repair, marketing inserts, gift wrapping, promotional items, re-supply ordering from your suppliers, retail replenishment (vendor managed inventory) for final customers, E-commerce website operation or call center to take customer orders, manage financial transactions, manage documentation for import/export/customs clearance, and provide security for expensive items (e.g., jewelry, electronics, drugs).

2. How are product knowledge intensive distributors different from logistics intensive distributors?

Figure TN-3 represents possible continuums of expertise in distribution between a logistics focus and a product knowledge focus (Closs, 2007; Coyle et al., 2009).

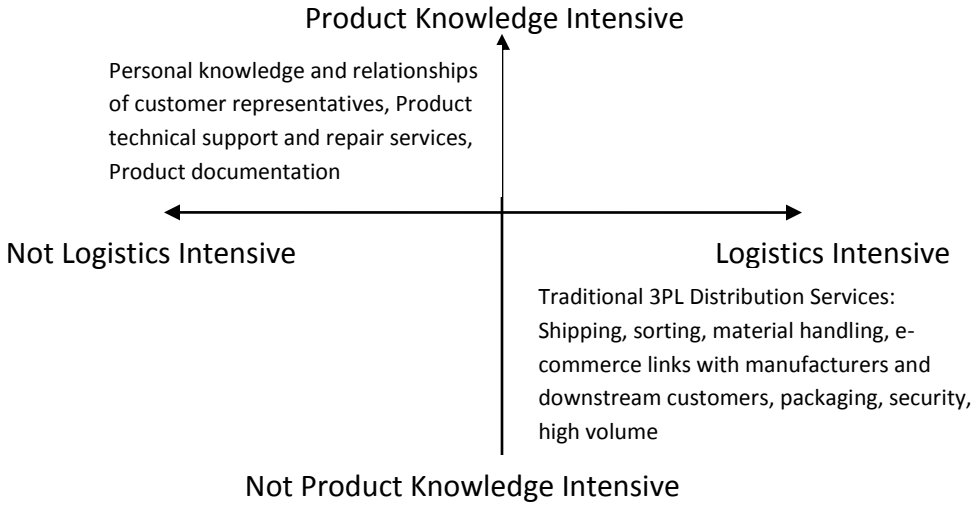

Figure TN-3. Logistics Intensive and Product Knowledge Intensive Distributors

When orders are placed from a website, the requests for those items are filled by a distributor whose expertise is in high volume logistics: shipping, handling, packaging, e-commerce linkages, and more. Distributors such as MESCO could be described as product knowledge intensive. Their primary value provided to manufacturers, besides physical delivery of the product, is personal relationships which includes a deep knowledge of regional customers for their products. Their primary value added for their downstream customers is speed of providing products and knowledge of the various manufacturers and their products in the measuring equipment industry.

3. Is the Internet considered to be a disruptive technology in the distribution industry? What other industries have faced a similar challenge?

In order to answer this question, students must carefully evaluate the current or traditional technology – virtual private networks (VPNs), fax machines, and other - against the potentially disruptive one – Internet-based applications (Founou, 2002; Piccoli, 2008). They should first determine what performance metrics the current established base of customers and suppliers value. Note that identifying the existing customer/supplier base and its preferences is a critical point in the analysis. Some customers and suppliers are more likely to value Internet features over those of the more "traditional" technologies; making sure the students identify the preferences of many types of stakeholders in the distribution network is important for a disciplined analysis.

When focusing on the attributes that current customers and suppliers value, students may need help in identifying the following:

- Knowledge: knowledge-based distribution is largely about access to knowledge and relevant information in an easy to read, structured format.

- Richness: The depth and audio/visual richness of products displayed through dynamic websites with 3D capability and customization of product views is invaluable.

- Interaction & Networking: The depth of the communication, exchange, and relationships that can develop through social networking and other collaborative environments will become invaluable in continuing the strong ties that have been established in the past through face to face contact with customers.

- Guidance: The opportunity to teach, train, engage in conversations and provide expert advice in real-time environments such as chat rooms, collaborative interfaces, and web-based seminars will help position a knowledge-based distributor as extremely valuable in an environment overloaded with easy-access information.

- Community: Having access to the MESCO "family" is not to be taken lightly. Building a community of stakeholders who share common goals and interests will continue to become indispensable in social, professional, and industry related networks.

By considering the distribution of information in the distributor network, students should recognize the Internet as an almost "perfect" information environment where pricing and

availability are readily known for virtually any product or service. In this sense, manufacturers can offer their products to anyone with Internet access, including customers once connected only through the distributor network. Immediate access to digital information has altered the role of the distribution function as content and media are clearly separated, as in the newspaper industry or, what may be more familiar for students, movie distribution, i.e., Blockbuster vs. Netflix. The pervasive nature of digital media has changed the face of competition in several industries, and companies that take the initiative to strategically reconstruct their business can gain vs. lose as new technologies are introduced.

4. How would an enterprise resource planning (ERP) system help MESCO?

Enterprise Resource Planning systems have been said to reduce the complexity in organizations by integrating business processes, establishing a common data source, and thus, improving operations and communications (Sumner, 2005; Magal and Word, 2011). ERP systems are designed to address an array of problems that all firms face as part of doing business. ERP systems can be used to structure best-practices in many business processes including materials management, sales and distribution, manufacturing, inventory management, accounting, human resources, and facilities management. ERP systems are designed to work together with other information systems such as production automation, customer relationship management (CRM), e-commerce applications, supplier relationship management (SRM), and a number of other solutions to help manage the resources of an organization.

The defining characteristics of ERP systems are modular integrated software applications that span all organizational functions built around one database at the core, application and data integration, and configurability:

Modularity

- Ensures flexibility
- Firms can decide what functionalities to enable or not (however, must pay for each)
- No vendor is best in all modules/areas
- Sample modules include Customer Relationship Management (CRM), Supplier Relationship Management (SRM), Supply Chain Management (SCM), Product Lifecycle Management (PLM)

Application & Data Integration

- Native integration (integration across modules)
- One event triggers activity across modules
- Focus on information vs. processes
- Multiple physical data stores are treated as one
- Ensures data integrity (accuracy), reduces redundancy, enforces one data schema (consistent definitions)

Configurability

- Parameterized, can choose different configurations
- Bolt-on modules extend capabilities of the standard applications; allows tailoring of the Enterprise System (ES)

- Written in native ES programming language; therefore, vendor maintained (Magal and Word, 2011)

Advantages of an ERP system include:

- Efficiency – rein in complexity, support of legacy systems, single data entry, reduction of indirect costs through streamlining business processes and operations
- Responsiveness – integration improves ability to respond to customers and market changes
- Knowledge Infusion – imbeds state of the art, "best" business technology in industry practice
- Adaptability – customization better than off-the-shelf applications; uses configuration tables and bolt-on functionality

Limitations of an ERP system are:

- Requires migration and consolidation of data repositories
- Vendors work with integrators (e.g., Accenture, Ernst & Young) who take ownership of the installation, implementation, and adaptation processes; fee based vs. licenses, can be expensive
- Trade off standardization vs. flexibility
- Limitations of best practice software
- Potential for strategic clash
- High costs and risks of the implementation process

Due to the complexity of managing a high volume of information and the transactions that flow between manufacturers and customers, an effective distributorship must utilize an ERP system for timely and accurate knowledge management.

The following is a list of opportunities for MESCO to utilize an ERP system, functioning as a knowledge manager in the distribution network:

- Manage and structure linkages between upstream (suppliers) and downstream (customers) firms

- Use of Inter-organizational information systems to address the concern by suppliers that MESCO is not up-to-date in their use of readily available technologies; such use would re-affirm MESCO's reputation as a reliable distributor and strengthen supplier-vendor relationships

- Extend use of the Internet and Web 2.0 technologies to mid-sized and small operations by evaluating solutions readily made available by reputable IT vendors

- Integration with Enterprise System (internal), boundary-spanning Supply Chain Management (SCM) system (internal-external), and Social Networking technologies (mainly external)

- SCM systems will minimize slack resources (under-utilized labor; slow-downs or shortages due to lack of needed products)
- Improve logistics through strategic alignment of transportation between stakeholders
- Promote better purchasing decisions in MESCO's inventory management system through improved communications
- Promote better decisions between MESCO's internal departments and the extended business units through more timely, relevant information

5. What challenges will MESCO face in implementing or not implementing an ERP system?

In implementing an ERP system, MESCO faces the same challenges for any company making the decision to upgrade or even re-engineer its business processes using a "disruptive" yet strategically beneficial technology (Founou, 2002; Piccoli, 2008):

- Cost to implement and maintain an ERP system (i.e., TCO-Total Cost of Ownership)
- Extensive training needed to prepare employees to use a new technology
- Time – typically years – required to implement and recognize value from an ERP system
- Resistance to change anticipated from current employees
- Expertise and analysis required to choose the "right" system configuration
- Need for management buy-in and holding individuals accountable for a successful implementation

Alternatively, the following is a list of risks for MESCO if the company does not utilize the technology available to secure and strengthen its position in the distribution network:

- Loss of sales due to disintermediation
- Continued missed opportunities due to delayed, unstructured communications
- Loss of positioning and reputation when regarded as not current in the use of technology
- Loss of positioning as competitors incorporate the use of standard resource, information, and business process management technology (ERP)

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Subject: Submission of Case Manuscript

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References

Bowersox, D. J., Closs, D. J., & Cooper, M. B. (2010). *Supply chain logistics management (*3rd ed.). McGraw-Hill Irwin: New York.

Closs, D. J. (2007). How can supply chain information technology enhance competitiveness? *Logistics Quarterly*, 14(4), 10-11.

Coyle J. J., Langley, Jr., C. J., Gibson, B. J., Novack, R. A., & Bardi, E. J. (2009). *Supply chain management – a logistics perspective*. South-Western Cengage Learning: Mason, OH.

Founou, R. (2002). The role of IT in logistics: competitive advantage or strategic necessity? *2nd Swiss Transport Research Conference* (pp. 20-22). Monte Verita, Ascona.

Lawrence, F. B., Jennings, D. F., & Reynolds, B. E. (2005). *ERP in distribution*. Thomson, South-Western: Mason, OH.

Magal, S. R., & Word, J. (2011). *Integrated business processes with ERP systems*. John Wiley & Sons: New York.

Piccoli, G. (2008). *Information systems for managers: text & cases*. John Wiley & Sons: New York.

Sumner, M. (2005). *Enterprise resource planning.* Pearson Prentice Hall: Upper Saddle River, New Jersey.

Wailgum, T., & Koch, C. (2008). ERP definitions and solutions. *CIO Magazine.* Retrieved May 4, 2011, from http://www.cio.com/article/40323/ERP_Definition_and_Solutions.