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# DIAGNOSING PROBLEMS AND PRESENTING A SOLUTION TO IMPLEMENTING QR/SCM: A CASE STUDY OF THE KOREAN TEXTILE INDUSTRY

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## Abstract

*The supply chain has become a focus of organizations faced with the need to survive in a highly uncertain business environment characterized by rapid technological change, global competition, and demanding customers. Many believe that quick response is fundamental to maintaining a leadership position in the world market. However, little research investigating the relationship between Quick Response and Supply Chain Management through case study. The purpose of this study is to help the Korean textile industry adopt QR/SCM efficiently by demonstrating its importance and laying the foundation for the implementation of QR/SCM. Through this case study, we found that to rapidly introduce new products and keep competitiveness in a volatile business environment, textile manufacturers should build up strong partnerships with up- and down- stream distributors by information sharing and collaboration.*

*The study consists of four parts. The first part is a review of previous studies. In the second, the ten management components of SCM are derived in order to determine the level of domestic QR/SCM implementation. In the third section, real case studies of six of the eight domestic companies were conducted from the perspective of SCM management components. In the final part, problems relating to implementing QR/SCM in the Korean textile industry are discovered and desirable solutions offered.*

## Introduction

The textile industry had been the major export industry, leading the strong growth of the Korean economy. In 1997 the textile industry made up 18.5 percent of national manufacturing organizations, employed 14.7 percent of the national workforce and generated 7.3 % of its gross production (KTIA, 1999). However, the labor-intensive textile industry began fading as investment dried up. Businesses in the United States of America have devoted itself to revive its textile industry with Quick Response (QR) in order to transform America's textile industry into a high value-added industry. This study applies to the textile industry and focuses on the introduction of Supply Chain Management (SCM). The purpose of this study is to diagnose problems encountered when the Korean textile industry adopted SCM and SCM, and suggested a solution to implement via case studies about current condition of QR, a form of SCM,

## **Relevant Literature Review of QR/SCM**

### ***Definition of QR***

In 1990, Stalk and Hout suggested that Wal-Mart's success is due to responsiveness and replenishment to customer needs. Compared to competitors, K Mart, Sears, or Zayre replenish their stocks every two weeks. However, Wal-Mart replenishes the stock in its stores on average twice a week.

Quick Response (QR) was originated from a report prepared in 1985 by Kurt Salmon Associates (KSA). Quick Response was first proposed by the American Apparel Manufacturers Association (AAMA) to increase the competitiveness of the apparel industry in 1987 (AAMA, 1987).

The Textile Apparel Linkage Council (TALC) defined QR as manufacturers' response to quality, volume and delivery customers want to, and the effects of QR as shortening lead-time, and reducing inventory cost and direct cost. TALC also suggested flexibility be a crucial factor to achieve the QR effect (Kincade, 1995; Ko and Kincade, 1998).

Lehtonen et al. (1999) define QR as the ability to plan, production, and delivery within a time the customer can be satisfied. To successfully implement QR, it may appear as a part of another strategy, including new technology introduction, modular process layout, process restructure, total quality management (TQM), and participation program.

For example, 1985, Kurt Salmon Associates projected \$25 billion was being lost annually as soft goods merchandise inched its way through the seemingly endless supply chain from raw fiber to consumer purchase. Excess inventories accumulated at every stage of the system. Long lead times assured either over-production of unwanted merchandise, which led to forced markdowns, or under-production of popular styles, leading to retail stockouts. Worst of all, the unnecessary costs created by these inefficiencies were passed on to the consumer, whose needs were poorly served by an unresponsive system. After implementing QR, KSA eliminated this mistrust and establish a win/win/win relationship for suppliers, retailers and, most importantly, the consumer.

### ***Definition of Supply Chain Management***

To cope with increased competition and other issues, such as the shorten product life cycle, fast-changing and rising customer expectations, and the increased demand for diversified products, organizations are trying to do their best to find a way to survive. As a way of survival, Supply Chain Management encompasses the process from the raw material supplier to the final customer for the product (Stevens, 1989; Davis, 1993).

Especially in manufacturing, the appropriated SCM are viewed as a way to achieve success and meet with goals such as delivery, quality, speed, and flexibility. There are a number of definitions of supply chain, based on the different areas it is used in, such as marketing, manufacturing, and finance (Stevens, 1989; APICS, 1995; Handfield and Nicholas, 1999).

As an example of one definition from the manufacturing side, Stevens (1989) defined the supply chain as "a system whose parts include material suppliers, production facilities, distribution services and customers linked together through the feed-forward flow of materials and the feedback flow of information." Handfield and Nicholas (1999) also defined the supply chain as "multiple organizations linked together to provide goods and services to the end customer."

Throughout the tight integration between the intra-organizational functions (e.g. marketing, manufacturing, financing, and service) and extra-organizational functions (suppliers, vendors, and channel members), the supply chain can lead the way to survival in this highly uncertain environment (Vickery et al. 1999). Galliers et al. (1995) point out the importance of the Electronic Data Interchange (EDI) as a representative example of information management for successful supply chain management and Murphy and Daley (1996) suggest the benefits of the EDI system for the supply chain.

### ***The Difference of QR and SCM***

There is no major difference between QR and SCM. The goal of both is to maximize the supply chain's efficiency and customer satisfaction. But, while SCM is commonly applied in all industries, QR is a form of SCM for limited sectors such as the retailing and apparel industries. According to KSA, QR focuses on the core processes in the supply chain, redesigning them to eliminate

wasted efforts or resources. There are four core business processes, such as product development, assortment management, replenishment, and promotion, in both industries that involve both suppliers and retailers.

## Case Study

It has been only couple of years since QR was implemented in the Korean textile industry, but a few organizations have been trying to reform the process and shorten lead-time inside organizations with less time limit and higher productivity as a guide. This case study focuses on QR/SCM activities of Korean textile companies such as Cheil Industry, Wonpoong, Dongil Renown, LG Fashion, and Shinwon.

### *Motivation and Stage of QR Introduction*

Motivation and situation of QR implementation for each case company is shown in Table 1.

**Table 1. Motivation and Situation of QR Implementation**

<b>Firms</b>	<b>Introduction</b>	<b>Motivation</b>	<b>CEO Support</b>	<b>Task Restructure</b>	<b>Effect of Q/R</b>
<i>Cheil</i>	1998	Uncertainty- Reduction Lead time- reduction	Strongly Support	Implementation (within organization)	Sale Opportunity- Increase Inventory- reduction, cost – reduction
<i>Wonpoong</i>	1994	Uncertainty- Reduction Inventory- reduction	Strongly Support	Implementation (within organization)	Sale Opportunity- Increase Inventory- reduction, efficient Equipment use
<i>Dongil</i>	1999	Uncertainty- Reduction Inventory- reduction	Strongly Support	Implementation (within organization)	Sale Opportunity- Increase Inventory- reduction,
<i>LG</i>	1994	Uncertainty- Reduction Product- control	Strongly Support	Implementation (within organization)	Sale Opportunity- Increase Inventory- reduction
<i>Shinwon</i>	1993	Man power problem - Reduction Inventory- Reduction	Strongly Support	Implementation (within organization)	Sale Opportunity- Increase Lead time - reduction, Cost reduction

### *Strategies and Contents of QR*

Table 2 compares motivation and situation of QR introduction with each case company, sorted according to introduction strategy of QR. Utilizing QR has been in progress while placing emphasis on innovation of management in the manufacturing process, the rationalization of management, and information-oriented structure. Strictly speaking, however, since the purpose of information system progress is not to support information sharing among organizations through supporting physical distribution system, inventory control, and quick understanding of information about sales, QR is based on rationalizing each company's physical distribution.

**Table 2. Strategies and Contents of QR**

	<b>Industry</b>	<b>Q/R Focus</b>	<b>Q/R Contents</b>	<b>Q/R Department</b>	<b>Q/R Range</b>
<i>Cheil</i>	Fabric, Apparel	Delivery, Inventory control	Production –innovation-pursuing Information-activities pursuing	Production planning department	5% of products
<i>Wonpoong</i>	Apparel	Mass customization	Production –innovation pursuing	Product planning department	10% of Products
<i>Dongil</i>	Apparel	Delivery	Response-production pursuing	Product planning department	50% of Products
<i>LG</i>	Apparel, Retailing	Inventory Control	Information-activities pursuing	QR department	50% of Products
<i>Shinwon</i>	Apparel, Logistics	Logistics	Information-activities pursuing	Logistics department	-

### ***Level of QR/SCM Introduction***

Unlike other industries, the textile industry encompasses many stages of the supply chain and undergoes complex processes until a product reaches an end consumer. Despite its complex structure, each stage of the supply chain is independent. Thus, we focus on products and related supply chain in our discussion.

### ***Plan and Control***

Throughout the supply chain an evaluation system for suppliers has yet to be prepared. Thus, the control of supplier is still not systematic. The most common problem encountered in the supply chain was the lack of control over the quality of materials supplied. Most companies are well aware of the importance over the quality of materials supplied in order to cut down on the cost of production and improve the quality of products.

### ***Integration of Business Structure***

In the textile industry there is a weak relationship between organizations' functional structures. Because of this weak relationship no organization uses Business Process Reengineering (BPR). Thus, we can say that organizations are bypassing these important opportunities to reduce inefficiencies resulting from the same function repeated in the supply chain.

### ***Organizational Structure***

Organizations communicate with each other somewhat about their technology transfer. Shinwon had an employee-adviser system, which plays a role of mediating between the supplier and the designer. However, Shinwon's system did not seem to help reduce inefficiency or integrate the supply chain since the system focused only on product related parts.

### ***Product Flow's Equipment Structure***

When we examine the levels of QR/SCM introduction based on the flow of the product, the Korean textile industry has been automating its equipment. Larger textile organizations are more likely to automate their systems than their smaller counterparts. However, from the standpoint of the flow of products being closely connected with organizations, it is not clear that QR/SCM has yet been established. Even people in charge of a physical distribution don't realize the necessity of the introduction and application of standard code supporting the product-flow. Automated systems are built by the necessity of cost reduction. For

this reason, problems could partly be the result of relation with suppliers. Shinwon is a good example of this. The reason that Shinwon's automated system for operating physical distribution warehouses was less efficient than what it was expected is the lack of support from salesrooms and suppliers.

### ***Information Flow's Equipment Structure***

All case studied organizations are aware of the information system within their organizations, but the information sharing system's introduction between organization and product improvement through the supply chain are insufficient. In addition smaller organizations are late to implement information systems. The textile industrial union is trying to implement a standard code and a standard EDI, but the efficiency of these standardizations is doubtful. Because apparel products have their own characteristics, it is hard to standardize, and if apparel products are standardized, individual products may lose their own unique characteristics.

In the case of LG Fashion, even though they have a good information infrastructure between sale shops and the organization, this infrastructure is not efficiently used because it is not used for sharing information with supply chain participants, but only for the organization's profit.

In information sharing, LG Fashion has conservative awareness, thus LG's information system is planning to improve consumers' satisfaction and LG is not interested in information sharing with other companies and within up/down stream suppliers.

### ***Product Structure***

Unlike other industries, the Korean textile industry doesn't have any standards on products or a standardized industrial basis. Thus, it is meaningless to discuss standards. However, there is one standard for spun thread based on the number of twisting threads and the width of the thread. Spun thread manufacturing companies and cloth manufacturing companies are developing the standard together. As we discussed earlier, this cooperative development is only partial and much less effective than it could be.

### ***Management Methods***

Most companies answered that they have different management methods. We have examined differences in organizations' sales activity from the example of Shinwon. The organizations have channel conflicts with each other by different sales activities. The difference between department stores and agency shops is a good example; Department stores' management is direct sale by the apparel organization with the lease of salesrooms. On the other hand, agency shop's is consignment sale via franchising. In addition, depending on an organizations' scale, management method is different. Large-scale organizations generally prefer a management method relying on information systems unlike small organizations.

### ***Leadership and Power Structure***

It is unique about power structure in the observed supply chain. The spun thread manufacturing organizations, the highest stage in the supply chain, and the department stores, the lowest stage in the supply chain, have unusually strong power compared with organizations at other stages of the supply chain. The reason that the spun thread manufacturing organizations have strong power is that the spun thread supply is less than its demand due to their export driven management. In the case of department stores, they employ their influence over the upper class with their customer's purchasing power. Being opposed to department stores, the apparel organizations cannot make an agreement on an equal status with department stores since the apparel organizations are all small businesses. Since department stores and spun thread organizations don't feel a necessity for sales related information and product information but sales information, they don't feel the necessity for building up the QR/SCM. Particularly, department stores don't make a contribution towards the supply chain of the Korean textile industry because of their business styles, which are far from focusing the flow of the product.

### ***Partnership of Threat and Profit Sharing***

Relation have not improved by long-term contracts, mutual guarantee or sharing of market threats. Even though there were long-term contracts with main suppliers, there was not a specific blanket order. The relation between organizations has been conflict

oriented with individual interests rather than pursuing mutual interests or cooperation. When organizations build up partnerships with suppliers, the organizations enter into business with the suppliers that have good terms and conditions and offer desired quality. Even though large organizations are somewhat aware of the necessity for long-term business or interests from building up partnerships, few have a concrete plan. Large organizations built up only basic elements for sharing information, technology and experience at the least common denominators.

**Cultural Homogeneity**

Each company recognizes its cultural differences between companies from the prospective of pursuing the homogeneity of culture and management method, which are the foundation for inter-enterprise communication and partnerships. Since the transactional practices in the Korean textile industry have problems, only any one individual company cannot have enough impact on improving QR/SCM. In addition, different management methods between companies have influenced terms for credit, quality and the time for payment. Differences of companies’ scales and their core competitive powers are the main factors.

**Problems and Solution of QR/SCM in the Korean Textile Industry**

As a result of the case study, we diagnose the problems of QR/SCM and present a solution for QR/SCM’s problems. The problems and solutions of QR/SCM based on the Korean textile industry are shown in Table 3.

**Table 3. QR/SCM’s Problems and a Solution**

<b>Problems</b>	<b>Solution</b>
? <i>Lack of QR/SCM’s awareness</i>	! Building QR/SCM infrastructure, ! Long term insight on equipment and human resource
? <i>Short term insight of sale performance</i>	! Long-term insight profit through information sharing system
? <i>High launching cost</i>	! CEO’s strong support, ! Certainty of QR/SCM effect
? <i>Lack of cooperation with other suppliers</i>	! Restructure task process
? <i>Conservative information sharing with suppliers</i>	! Extension of information sharing ! Standardization of information system
? <i>Absence of systematic management for suppliers</i>	! Extension of partnership of suppliers ! Fair evaluation system
? <i>Unbalance of supply chain’s structure between apparel organizations</i>	! Enhancing linkage within apparel industry ! Building QR/SCM for apparel industry
? <i>Unbalance of supply chain’s structure between apparel organizations</i>	! Enhancing linkage within apparel industry ! Building QR/SCM for apparel industry

**Conclusion**

In the field of QR/SCM the Korean textile industry is behind the USA and Japan. However, few companies in the Korean textile industry try to use the techniques of QR/SCM. From the prospective of the supply chain, QR/SCM in the Korean textile industry would mean the integration of the internal structure stage while stressing internal liaisons.

The current stage doesn’t reach the target stage, which improves external relationships with business acquaintances. Particularly, in the area of information sharing, the Korean textile industry is not only conservative but also lacks a proper infrastructure, such as standardization, in order to share information between companies. There are some hostile relationships and conflicting interests among the members of the supply chain. There are also different traditional practices on transactions and cultural differences. This study examined several problems based on current QR/SCM implemented in the Korean textile industry.

First, the Korean textile industry has less awareness of QR/SCM than its Japanese and American counterparts. Second, sacrifice performance in exchanges for short-term insight. Third, there is high launching cost for QR/SCM. Fourth, there is a problem with

the lack of participants' cooperation across the supply chain. Fifth, the conservativeness regarding information sharing with suppliers is problematic. Sixth, absence of systematic management for suppliers is a barrier. Seventh, the unbalance of the supply chain's structure between apparel organizations is needs to be addressed.

In order to solve these problems with QR/SCM, it is necessary to lead the Korean textile industry to a better understanding of QR/SCM. To restore the Korean textile industry, it is necessary for it to consider these areas of concern and context.

In sum, we suggest QR/SCM allow organizations to realize the advantages of vertical integration or virtual integration. To do successful QR/SCM implementation, certain conditions must be present. The most important prerequisite is that the organizations consider QR/SCM as competitive priorities (Baatz, 1995).

Another key to QR/SCM implementation is a state-of-the-art information system as a mediator between assemblers and suppliers or between assemblers and consumers. As Bensaou (1997) demonstrates, for Information Technology to have a positive and significant addition explanatory power on the degree of buyer and supplier cooperation, information sharing system is needed to allow QR to strengthen action plans for the supply chain (Polakoff, 1992; Romero, 1991).

Finally, we recognize that when CEOs strongly support QR/SCM, QR participants in the supply chain, such as product designers, manufacturers, distributors, and consumers should be linked.

## References

- American Apparel Manufacturers Association (AAMA), *Getting Started in Quick Response*. Arlington, VA., 1987
- APICS Dictionary, 8<sup>th</sup> ed., American Inventory and Production Society, Inc., Falls Church, Virginia, 1995.
- Baatz, E.B. "CIO 100 - Best Practices: The Chain Gang", *CIO*, Vol. 8, No. 19, 1995, pp. 46-52.
- Bensaou, A. "Inter-organizational Cooperation: The Role of Information Technology An Empirical Comparison of U.S. and Japanese Supplier Relations," *Information Systems Research*, Vol. 8, No. 2, 1997, pp. 107-124.
- Davis, T. "Effective Supply Chain Management," *Sloan Management Review*, Summer, 1993, pp. 35-46.
- Galliers, R. and Swatman, P. "Strategic Information Systems Planning: Comparative Advantage from EDI," *Journal of Information Technology*, Vol.10, 1995, pp.149-157.
- Handfield, R. and Nichols, E., *Introduction to Supply Chain Management*, Prentice-Hall, New Jersey, 1999.
- Kincade, D. H. "Quick Response Management System for the Apparel Industry: Definition through Technologies", *Clothing and Textiles Research Journal*, Vol. 13, 1995, pp. 245-251.
- Ko, E., and Kincade, D. H., "Product Line Characteristics as Determinants of Quick Response Implementation for U.S. Apparel Manufacturers", *Clothing and Textiles Research Journal*, Vol. 16 No.1, 1998, pp. 11-18
- Korean Textile Industry Association (KTIA), "Development Partnership of Quick Response System in Taegu Industrial Complex," 1999, pp. 63-65
- Lehtonen, J., Holmstrom, J., and Slotte, J., "Constraints to Quick Response Systems in the Implosive Industry", *Supply Chain Management*, Vol. 4, No. 1, 1999, pp. 51-57
- Murphy, P. and Daley, J., "International Freight Forward Perspectives on Electronic Data Interchange and Information Management Issue," *Journal of Business Logistics*, Vol. 17, 1996, pp. 63-84.
- Polakoff, J. C., "Of Kites, Cranks, and Switches - And JIT purchasing" *Corporate Controller*, Vol. 12, No. 5, 1992, pp. 30-32.
- Romero B. P., "The Other Side of JIT in Supply Management," *Production and Inventory Management Journal*, Vol. 32, No. 4, 1991, pp. 1-3.
- Stalk, G. Jr., and Hout T. M., *Competing Against Time: How Time-based Competition Is Reshaping Global Markets*, Free Press: New York, 1990.
- Stevens, J., "Integrating the Supply Chain," *International Journal of Physical Distribution and Materials Management*, Vol. 19, 1989, pp. 3-8.
- Vickery, S., Droge, C., and Markland, R. E. "Dimensions of Manufacturing Strength in the Furniture Industry," *Journal of Operations Management* (15), 1997, pp.317-330.
- [http://www.kurtsalmon.com/KSA\\_consumer/Thought%20Leadership/QR/QR.html](http://www.kurtsalmon.com/KSA_consumer/Thought%20Leadership/QR/QR.html)