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Review of Quick Response: Investigation on its Fundamental Role of Supply Chain Collaboration

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Abstract

Purpose - This study investigates the key features of Quick Response as the fundamental form of supply chain collaboration by reviewing the selected past studies. Based on the findings from the literature review, this study provides the guideline for future researchers and business practitioners who search for more advanced collaboration programs.
Research design, data, and methodology - This study conducts the literature review on the past studies that had researched Quick Response. The selected studies are analyzed in terms of how to represent Quick Response in the models and which issue to address.
Results - This study finds that the past studies lack a unified concept of Quick Response, and they fail to provide the consistent guideline on how to run this program in practices. The literature review also shows that only a small number of research issues has been addressed by most researchers.
Conclusions - On the purpose of figuring out the real value of Quick Response, this study suggests that future studies apply its extensive application to the entire supply chain system. This study also shed light on the potential of Quick Response to be a more advanced supply chain collaboration program with additional collaborative functions other than information sharing.

Keywords: Supply Chain Collaboration, Quick Response, Inventory Management, Literature Review.

JEL Classifications: D24, D89, M11.

1. Introduction

Quick Response is the special program that is designed to reduce lead time and improve responsiveness to customer demands. In general, Quick Reponses has been recognized as a form of supply chain practices by many studies (Choi, Zhang, & Cheng, 2018; Chow, Choi, & Cheng, 2012; Derrouiche, Neubert, & Bouras, 2008; Krishnan, Kapuscinski, & Butz, 2010; Serel, 2012; Sullivan & Jikyeong, 1999), since its application requires the certain coordinated works among different supply chain parties, for examples, the agreement on when to place orders and sharing demand information based on POS system (Giunipero, Fiorito, Pearcy, & Dandeo, 2001; Palmer & Markus, 2000; Serel, 2009). Quick Response is commonly considered to be the one of supply chain collaboration initiates such as collaborative Planning, Forecasting, and Replenishment (CPFR), Vendor Managed Inventory (VMI), and Efficient Consumer Response (ECR) (Chow et al., 2012; Derrouiche et al., 2008; Sullivan & Jikyeong, 1999).

Originally, the apparel companies developed Quick Response to mitigate the inherited problem of volatile market demands in their industries by improving responsiveness to customers' needs (Birtwistle, Moore, & Fiorito, 2006; Giunipero et al., 2001). Due to its success in the apparel industry, the application of Quick Response has expanded to various business areas including automobiles, food, toys, and hospital industries (Birtwistle et al., 2006; Choi, Li, & Yan, 2006; van Wijk, Adan, & van Houtum, 2013; Weir, Browne, Byrne, Roberts, Gafni, Thompson, Walsh, & McColl, 1999). Many academic researchers also pay attention to Quick Response, and they conduct studies on this program with a series of issues including its benefits and manufacturing applications (Cachon & Swinney, 2009; Choi et al., 2018; Chow et al., 2012; Fernandes & do Carmo-

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Silva, 2006; Godinho Filho, Marchesini, Ganga, Riezebos, & Vandaele, 2017a; Lin & Parlaktürk, 2012).

This study reviews the literature on Quick Response. Different from the related past review studies that address the general issues of supply chain management (Erenguc, Simpson, & Vakharia, 1999; Govindan, 2013; Marques, Thierry, Lamothe, & Gourc, 2010), this study emphasizes the collaborative relationship between different supply chain parties in its review of literature on Quick Response (Hwang & Suh, 2017). Through the detailed analysis on the past studies that conducted research on Quick Response, this study intends to find out the special collaborative features of this program that allow the supply chain system to improve its performance. Furthermore, by identifying the key issues that have been addressed in the past studies, this study seeks to provide future researchers with the valuable guidelines that help them figure out the true nature of Quick Response as a supply chain collaboration program.

The literature review of this study shows that many past studies use different forms of Quick Response, and they rarely provide the business practitioners with the consistent guidelines on how to manage this program. Most studies on Quick Response address only a limited number of issues including its performance measurement and flexible manufacturing, and it is necessary to expand the research focus to more diverse areas such as demand forecasting and the program cost. The analysis on the past studies also discloses that there is a lack of key collaborative features in Quick Response compared with other proactive collaboration programs such as VMI and CPFR, and this study points out the critical collaborative functions that can be supplements to the original Quick Response.

2. Research Background

2.1. History and Definition

Quick Response has its origin in U.S. apparel industry. Due to high competition and volatile market condition, most companies in the apparel industry have suffered from mismatch between supply and demand (Giunipero et al., 2001). In 1984, a group of U.S. apparel companies organized the 'Crafted With Pride in the USA Council' to cope with the foreign companies threatening the domestic market. They realized that many companies experienced the serious problems of huge cost and lost sales due to the unexpectedly long lead time for manufacturing and distributing apparels. Quick Response was developed to remedy the inherent problem in the apparel industry through lead time reduction (Birtwistle et al., 2006; Derrouiche et al., 2008).

Quick Response is defined to be a strategic program that is designed to reduce the manufacturing and distribution lead times and improve the customer responsiveness. In order to achieve the lead time reduction, Quick Response equips with special functions regarding production, logistics, and information exchange. In the production process, Quick Response employs Just-In-Time system, the modular manufacturing system, cellular process, and computer-aided design and manufacturing processes to realize the rapid production procedure (Birtwistle et al., 2006; Perry, Sohal, & Rumpf, 1999; Serel, 2009). Under Quick Response, the automated warehousing system and fast transportation modes such as air freight are commonly used to shorten lead time in logistics (Perry et al., 1999; Serel, 2009). For accurate demand forecasting and fast communication between supply chain parties, the advanced information technologies including Electronic Data Interchange (EDI) and Point of Sale (POS) scanning systems frequently appear in Quick Response (Derrouiche et al., 2008; Krishnan et al., 2010).

Once the outstanding performance of Quick Response is recognized, its application expands to other areas beyond the apparel business such as automobile, food, toys, on-line shopping, and hospital industries (Birtwistle et al., 2006; Choi et al., 2006; van Wijk et al., 2013; Weir et al., 1999). In 1990's, Quick Response became the basis where the companies in U.S. Food industry developed Efficient Consumer Response with the supplemented functions designed to improve the efficiency in store assortment, replenishment, promotion, and product introduction (Birtwistle et al., 2006; Derrouiche et al., 2008; Göran, 2002; Holweg, Schnedlitz, & Teller, 2009; Lohtia, Xie, & Subramaniam, 2004).

2.2. Benefits

In general, Quick Response is known to benefit both manufacturer and retailer. Under Quick Response, the retailer can save the inventory holding cost by lowering the inventory level due to delayed ordering close to the sales point. Quick Response even increases the retailer's sales because the retailer can improve the customer service by estimating the customer's demand accurately based on the real time demand information (Chan, Shen, & Cai, 2018; Giunipero et al., 2001; Iyer & Bergen, 1997). Furthermore, Quick Response brings better communication between retail shops and it enables the head office and distribution centers to develop the proper schedules of stock allocation and replenishment (Birtwistle et al., 2006).

Quick Response also alows the manufacturer to save the production cost, because of predictable production cycles and increased order frequency. Due to the close relationship with the retailer, the manufacturer can have the flexible production schedule by closely monitoring sales to customers (Giunipero et al., 2001). The increased sales, reduced inventory level, and multitasking workforce are other benefits that the manufacturer can obtain from Quick Response (Birtwistle et al., 2006).

The significant benefits of Quick Response have been observed in the real business cases. Primark, British apparel retailer, applied Quick Response to its system and increased its market share by 10.1% due to the improved inventory turnover. Another famous clothing retailer, Marks & Spencer achieved additional 11.4% market share after the company implemented this program (Lin & Parlaktürk, 2012).

3. Literature Review

First, the main body of the literature review focuses on how Quick Response appears in the supply chain models proposed by the past studies. This study also identifies several issues that the researchers have commonly addressed in their studies on Quick Response.

3.1. Quick Response in Research Models

Evidently, the literature review shows that different studies represent Quick Response as distinct modes in their proposed models. When the researchers conduct investigation on Quick Response, they adopt its special features that they highlight according to their own research interests. In general, Quick Response appears as one of the following three operational functions in the past studies.

The first group of studies emphasizes lead time reduction as the key role of Quick Response to be responsive to what customers want. In their studies, Quick Response is represented as a time-based competition paradigm (Godinho Filho & Veloso Saes, 2013), a combination of Just-In-Time and information technology system (Birtwistle et al., 2006), a make-to-order system (Fernandes & do Carmo-Silva, 2006), or even a zero lead time case (Krishnan et al., 2010).

Second, Quick Response is characterized as the operational process of ordering after knowing demands (Cachon & Swinney, 2009, 2011; Krishnan et al., 2010; Lin & Parlaktürk, 2012; Wang, Zhang, Cheng, & Hua, 2018). This special capability of Quick Response brings the significant benefits including accurate demand forecasting, resolving the demand uncertainty, and proper match between supply and demand.

Finally, a large number of studies focuses on the demand information updating that occurs in Quick Response. Most of the past studies in this group use the Bayesian approach to their analytical models and they assume that the retailer can use the market information obtained at the first period to update the demand information at the second period when he makes decisions on inventory control (Caro & Martínez-de-Albéniz, 2010; Chan, Choi, Hui, & Ng, 2015; Chan et al., 2018; Choi, 2013, 2017; Choi & Chow, 2008; Choi et al., 2006; Choi et al., 2018; Chow et al., 2012; Iyer & Bergen, 1997; Serel, 2009, 2012). Table 1 summarizes the different forms of Quick Response represented by the past studies.

Table 1: Forms of Quick Response appeared in past studies

Quick Response operations	Key benefits	Past studies
Lead time reduction	High responsiveness to customer needs	Godinho Filho and Veloso Saes (2013), Birtwistle et al. (2006), Fernandes and do Carmo-Silva (2006), Krishnan et al. (2010)
Ordering after knowing demands	Accurate demand forecasting, reduced demand uncertainty, reduced lost sales/ excessive stock	Cachon and Swinney (2009, 2011), Krishnan et al. (2010), Lin and Parlaktürk (2012)., Wang et al. (2018)
Demand information updating (Bayesian approach)	Proper replenishment decision based on the latest updated demands	Caro and Martínez-de-Albéniz (2010), Chan et al. (2015), Chan et al., (2018), Choi (2013, 2017), Choi and Chow (2008), Choi et al. (2006), Choi et al. (2018), Chow et al. (2012), Iyer and Bergen (1997), Serel (2009, 2012)

The literature review reveals that the past studies take their own ways to describe Quick Response and convey diverse visions on its applications happening in real industries. Since these studies rely on only partial features of Quick Response instead of its entire operations, however, they hardly provide the consistent managerial guidelines about how to manage Quick Response in practices.

3.2. Key Issues

This study identifies the main issues that have been frequently addressed by the past studies on Quick Response. First, since Quick Response became a major research topic in the academia, many researchers have sought to evaluate its value by using their theoretical models or surveys on the companies. Meanwhile, they possess different focuses in measuring the performance of Quick Response under diverse business situations.

Choi (2017) measures the profit difference between Quick Response and non-Quick Response in order to evaluate the value of this program. In his proposed model of two stage supply chain system, the retailer is assumed to be boundedly rational so that he determines his lot size non-optimally. The model analysis concludes that the retailer receives the benefit from Quick Response unless his ordering after Quick Response is extremely expensive. In both cases of Quick Response and non-Quick Response, the retailer's non-optimal lot sizing decision brings the significant damage to his own profit as well as the total supply chain profit. The retailer's boundedly rationality does not hurt the manufacturer's performance, and even the manufacturer can get the benefit from it by requiring the minimum ordering quantity from the retailer.

Choi et al. (2018) investigate the impact of Quick Response under the realistic situation where the retailer is

not perfectly rational. In their proposed model, the retailer has stochastic risk preference in choosing his order quantity, and the performance of Quick Response is measured in terms of each party's profit. Their numerical analysis shows that Quick Response increases the supply chain profit even when the retailer is stochastically risk sensitive. The manufacturer, however, losses his profit due to Quick Response. Their study also indicates that the retailer's benefit becomes bigger and the manufacturer's loss becomes smaller when the retailer is more risk averse stochastically under Quick Response.

Choi and Chow (2008) find out that the manufacturer may not receive the benefit from Quick Response, where the retailer can improve his performance. In order to realize the win-win situation for both retailer and manufacturer under Quick Response, they examine the effects of additional policies including price commitment, service level commitment, and buyback. The numerical analysis shows that three proposed policies can result in the wanted outcome but their detailed terms should be carefully designed.

The issue of asymmetric benefit of Quick Response between the manufacturer and retailer is also addressed by Iyer and Bergen (1997). They test three contractual commitments made between the manufacturer and retailer on the purpose of realizing the pareto-improvement where every supply chain party is profitable after Quick Response adoption. Their model analysis shows that the service level arrangement and volume commitment enable Quick Response to be beneficial for both manufacture and retailer. Meanwhile, the wholesale price commitment requires more than the flat pricing scheme to make the pareto-improvement.

Chow et al. (2012) investigates how the combination of Quick Response and the minimum order quantity commitment affects the supply chain performance. According to the numerical examples of their supply chain model, the manufacturer may not have profit loss, but the retailer's profit and the efficiency of the supply chain system can be significantly decreased because the minimum order quantity requirement hinders the merits of Quick Response. Instead, they propose the dynamic minimum order quantity policy with the specific terms modified depending on the updated demand information. The numerical analysis shows that their proposed policy can achieve the pareto-improvement under Quick Response.

Lin and Parlaktürk's study (2012) examines the impact of retail competition on the performance of Quick Response by formulating the supply chain system where two retailers compete over the single manufacturer. In their model analysis, three competition cases are considered depending on which retailer possesses the Quick Response capability. The results of their numerical analysis imply that the manufacturer and the whole supply chain can obtain the maximum profits when a single retailer has the exclusive capability of Quick Response. Caro and Martínez-de-Albéniz (2010) also examines the impact of Quick Response on the firm performance in the supply chain system where two retailers compete in inventories. Based on the model analysis, they find that Quick Response enables the retailer to take the competitive advantage over another retailer, and even the retailer without Quick Response capability performs better when he competes with another retailer who has that ability than the one who does not.

Cachon and Swinney (2009) examine how the strategic consumer behavior affects the performance of Quick Response. In their proposed supply chain model, the retailer has the Quick Response capability to deal with the consumers who strategically choose when to purchase the products. According to their model analysis, Quick Response diminishes consumers' strategic purchasing behaviors and increases the product availability.

In addition to Quick Response, the study conducted by Cachon and Swinney (2011) considers the case of enhanced design, where the company invests in the product design to increase the consumer's value. The outcomes of their analysis imply that the combination of Quick Response and enhanced design increases the company's profit by making the consumers less willing to take risk for delaying purchasing the products.

In the supply chain model proposed by Wang et. al. (2018), the consumers have different risk preferences in determining time to purchase products and time erodes their valuation of the products. They investigates how the Quick Response strategy affects the profit of the retailer who sells the products to those consumers. Their model analysis shows that the Quick Response strategy increases the retailer's profit unless the Quick Response cost, which is the retailer's additional purchasing cost due to the delayed order, is significantly high. Their study also indicates that greater risk preference or higher valuation decreasing rate lowers the retailer's benefit from Quick Response. Different from Cachon and Swinney's study (2009, 2011), Wang et al. (2018) find out that the Quick Response strategy can remedy the negative impact of strategic consumer's behavior only when consumer's risk preference, valuation decreasing rate, and Quick Response cost are low.

Yang et al. (2015) focus on the decision-making structure of the supply chain system when they evaluate the value of Quick Response. Their study compares two distinct supply chain systems including the decentralized system where a manufacturer and a retailer are independent companies and the centralized system consisting only single company who manufactures and retails the products. Their analysis shows that Quick Response performs better under the centralized system than decentralized one, unless the additional cost due to Quick Response adoption is relatively high. They also test the role of the additional contracts under Quick Response, and the revenue sharing contract is found to be the effective tool that allows the decentralized system to outperform the centralized system. The revenue sharing

contract, however, shows its weakness because it may hinder the flexible allocation of the profits between the manufacturer and retailer.

Sullivan and Kang (1999) conduct the survey on New York State clothing manufacturers to examine the impact of Quick Response on the firm performances and they find that 82% of the companies that use Quick Response experience the improved returns on assets and 90% of them receive the increased inventory turnover rates. Their study also shows that 58% of Quick Response users perceive saving the production cost and 63% of them can reduce the work-in-process inventory.

According to Perry et al.'s study on the Australian textiles, clothing, and footwear industry (1999), after the companies use Quick Response, their on-time orders increase from 5% to 92.6%, sales revenue is enlarged from $A1.1 million to $A2.1 million, inventory turnover becomes doubled from 8 to 16 per year, and the majority of companies experiences that more customers are satisfied with their services.

Second, a group of studies focus on Quick Response Manufacturing that aims at improving utilization and efficiency with the time-based achievement in the production system (Godinho Filho, Marchesini, Riezebos, Vandaele, & Ganga, 2017b). Some researchers consider Quick Response Manufacturing as a more advanced production practices than the lean manufacturing and explore its key elements through empirical or case studies (Gómez & Filho, 2017; Godinho et al., 2017a). Other studies in this group propose the mathematical or simulation models that represent the characteristics of Quick Response Manufacturing (Fernandes & do Carmo-Silva, 2006; Kuroda & Takeda, 1998)

Third, the facility location is another issue that some researchers address in their studies on Quick Response. Since the physical distance between different operational facilities has a severe impact on the lead time, the careful decision on locating the facilities becomes a critical matter in Quick Response application. van Wijk et al. (2013) analyze the multi-warehousing system to determine the optimal choice between local and Quick Response warehouses. In Warburton and Stratton's study (2005), the tradeoff between cost and responsiveness is cautiously examined to obtain the strategic combination of onshore Quick Response manufacturing and offshore make-to stock production systems. Yang and Wee (2001) develop the mathematical model that determines the location of final production lines in response to changing market demand and continuing inventory deterioration under the Quick Response production strategy.

Other issues founded in the past studies on Quick Response include the solution algorithm development for the optimal inventory policy under the Quick Response system (Johnson & Scudder, 1999; Serel, 2009, 2012; Vaagen, Wallace, & Kaut, 2011; Yan & Yen, 2007), environmental protection (Chan et al., 2018; Choi, 2013), the choice between Quick Response production and outsourcing (Liu & Nagurney, 2013), the effect of different demand updating modes in Quick Response (Choi et al., 2006), and the impact of Quick Response on the retailer's sales efforts (Krishnan et al., 2010).

Despite all the efforts made by many researchers to investigate Quick Response, their key research topics are relatively limited in number. In order to understand the true nature of Quick Response and furthermore, develop the better supply chain collaboration program, the researcher should study about Quick Response in more diverse research perspectives.

The literature review on Quick Response reveals that many past studies have explored the value of Quick Response under various situations by considering competition, additional contracts, risk taking behaviors, and supply chain structures. Meanwhile, most of them simply assume that the well-known features of Quick Response, such as lead time reduction, demand information updating and order postponement bring the cost saving benefit to the supply chain system and ignore the comprehensive examination on how Quick Response results in the improved performance.

In addition, most studies using the mathematical models to evaluate the value of Quick Response assume the simple supply chain structure with two stages (Chan et al., 2015; Choi, 2017; Choi & Chow, 2008; Krishnan et al., 2010; Yang et al., 2015). Even though the majority of studies perceive Quick Response as one of supply chain collaboration programs, they still describe that this program occurs at the dyadic relationship between the manufacturer and retailer.

To achieve perfect understanding the true value of Quick response, future studies should conduct the sophisticated analysis on its detailed outcomes under the realistic situation where the supply chain system has more than two echelons, and identify its exact functions that lead to performance improvement. In particular, the prospective researchers can provide the business practitioners with specific managerial implications about how to run Quick Response properly by assessing its benefits in terms of the revenue increase as well as cost saving (Cachon & Swinney, 2011).

4. Implications for Future Study and Practical Application

From the literature review, this study obtains several findings about the past studies on Quick Response and provides the following suggestions that may be helpful for future researchers and business practitioners. First, many past studies define Quick Response in their own ways so that they are not able to offer the consistent managerial guideline about how to manage this program to the company managers. When the most researchers analyze Quick Response in their studies, they represent different features of this program in their models such as lead time reduction (Birtwistle et al., 2006; Krishnan et al., 2010),

demand information updating (Chan et al., 2015; Choi, 2013; Fernandes & do Carmo-Silva, 2006; Gómez & Filho, 2017; Serel, 2012; Warburton & Stratton, 2005), and ordering with knowledge of real demand (Cachon & Swinney, 2009, 2011; Krishnan et al., 2010; Lin & Parlaktürk, 2012; Wang et al., 2018).

With distinct perceptions about Quick Response, after all, the past studies hardly obtain generalizable conclusions about the specific operations of this program. Therefore, future studies need to refine the current diverse concepts of Quick Response and reach the consentient research results to present the company managers with the universal guidelines about how to run this program in a way to achieve the optimal performance.

Second, most past studies address a limited numbers of issues regarding Quick Response. While many studies conduct research on Quick Response, they focus on only a few subjects such as its performance measurement (Choi et al., 2018; Wang et al., 2018; Yang et al., 2015), supplementary contracts for pareto-improvement (Choi & Chow, 2008; Chow et al., 2012), and solution algorithm for optimal policy (Serel, 2012; Vaagen et al., 2011; Yan et al., 2007) In order to figure out the true nature of Quick Response, future studies should address additional issues such as the effect of demand forecasting (Iyer & Bergen, 1997) and Quick Response cost (Giunipero et al., 2001).

Third, Quick Response has been analyzed under the simple two stage supply chain system in the most past studies. While many studies examine how Quick Response affects the supply chain performance, most of them assume the simplified structure of the supply chain system having two echelons (Cachon & Swinney, 2011; Chan et al., 2018; Chow et al., 2012; Iyer & Bergen, 1997; Lin & Parlaktürk, 2012; Wang et al., 2018). Conventionally, the majority of past studies perceive that Quick Response occurs between the manufacturer and retailer, and only a few of them consider the supply chain system with more than two echelons. Even those studies that assume the multi-stage supply chain system focus on only the Quick Response production system instead of the general Quick Response process including logistics and distribution (Fernandes & do Carmo-Silva, 2006; Kuroda & Takeda, 1998).

Meanwhile, some researchers cast doubts on the studies that examine the supply chain collaboration based on the dyadic relationship between two members, and they claim that the supply chain collaboration programs should be applied to the entire supply chain system (Danese, 2004). It is typical of any collaboration programs to be fully beneficial to the supply chain system only when every party in the system collaborate together (Chopra & Meindl, 2010). With the aim of assessing the true value of Quick Response, therefore, the future studies need to consider the practical case where this program is employed at more than two echelons of the supply chain system.

Finally, Quick Response appears to be merely a preliminary form of supply chain collaboration where the supply chain parties share demand information. Even though quite a number of researchers admit that Quick Response is the one of supply chain collaboration initiatives (Chow et al., 2012; Derrouiche et al., 2008; Sullivan & Jikyeong, 1999), this program is perceived as only the passive collaborative practice. Compared with the active collaboration programs such as VMI and CPFR, which install the joint decision making process based on shared information, Quick Response equips with no other than information sharing activities as shown in Table 2 (Ryu, 2014).

Table 2: Supply chain collaboration programs analyzed in terms of three collaborative features

Supply chain systems	Information sharing	Cost payment	Decision authority
Traditional system	No information is shared.	Associated with ownership.	Associated with ownership.
QR	Limited information is shared.	Associated with ownership.	Associated with ownership.
ECR	Limited information is shared.	Associated with ownership.	Associated with ownership.
VMI	Information of retailer's inventory and demand is shared.	Vendor pays the entire cost of ordering and holding inventory.	Vendor determines ordering and holding inventory at retailer's warehouse.
CPFR	Information of demand, planning, and forecasting is shared.	Associated with ownership.	Associated with ownership, but decisions are made based on pre-set agreements

Source: Ryu (2014), "Review of Collaborative Planning, Forecasting, and Replenishment as a Supply Chain Collaboration Program", Journal of Distribution Science.

While a group of studies examines that the additional contracts such as the revenue sharing, price/service commitment, and buyback play the supplementary roles under Quick Response, most past studies still focus on a limited collaborative function of this program (Choi & Chow, 2008; Yang et al., 2015). Even though information sharing is the critical feature of any supply chain collaboration programs (Kim & Song, 2013), this study recommends that both researchers and company managers work together to explore the potential of Quick Response to be a more proactive collaboration program by considering additional collaborative functions other than information sharing.

5. Comparison with other literature reviews

There is a group of the past studies that conduct literature review on the research subject related with Quick Response. Some researchers investigate the characteristics

of Quick Response based on the literature review, and the others examine how the previous studies analyze the supply chain collaboration by observing the related programs including Quick Response and Vendor-Managed Inventory.

Based on the direct comparison with several relevant past review studies as shown in Table 3, the significance of this study can be identified. The literature review of this study addresses the issues regarding Quick Response in the perspective of supply chain management, as the past review studies do. This study shares the same research goal with other studies in that it pursues providing the guidelines for future studies. Meanwhile, the following uniqueness of this study can hardly found in any other related review studies.

First, this study emphasizes the collaborative functions of Quick Response by representing it as one of the supply chain collaboration programs. By illustrating Quick Response as a cooperative relationship between different supply chain parties instead of a mere supply chain management tool, this study identifies the collaborative features of this program.

Second, this study figures out the chance to improve research on Quick Response by conducting different classification from other studies. While most review studies classify the past studies in terms of supply chain operations or research methodologies, this study observes them based on how they define Quick Response in their models. Through the new classification of literature, this study concludes that a unified concept of Quick Response is needed to provide the consistent managerial implications to the company managers.

Finally, this study provides the useful implications for the business practitioners as well as the academic researchers. Most past review studies give suggestions to improve future studies on the related research subjects. This study presents both researchers and managers with the idea of improving the current form of Quick Response into more advanced supply chain collaboration program.

6. Conclusion

Quick Response has expanded its application to diverse business areas and shown the excellent achievement in many industries. Due to its prominence in real businesses, many studies have conducted research on this program as the supply chain collaboration program. This study reviews the past studies on Quick Response and aims to provide useful guidelines to future researchers and company managers.

The detailed literature review of this study reveals that most past studies fail to present the consistent ideas about how to manage this collaboration program to business practitioners, since they apply the different concepts of this program to their analyses. This study identifies only a limited number of research issues handled by many previous researchers who conduct research on Quick Response.

A simple dyadic relationship between two supply chain parties and a preliminary form of collaboration are the additional weaknesses that this study finds out from the past studies.

Based on the findings from the literature review, this study obtains the following valuable implications that may be helpful for the company managers who are willing to apply Quick Response to their business as well as the academic researchers who seek the true nature of this program in the future. First, the researchers should provide the business practitioners with the consistent managerial guideline on how to manage Quick Response based on the unified concept of this program. Second, more diverse research issues should be addressed by the researchers to understand the complete characteristics of this program. Third, the future studies need to examine the value of Quick Response by considering the case that this program is implemented to more than two stages in the supply chain system. Finally, both academic researchers and company managers should explore more proactive collaborative functions than information sharing of the current Quick Response and examine its potential to be more advanced collaboration program.

Table 3: Comparison with the related review studies

Authors (Year)	Review subject	Classification	Research Goals
Choi and Sethi (2010)	Quick Response	Information management, value of information, supporting technologies	Suggestions for future research and practical application
Godinho Filho and Veloso Saes (2013)	Lead time reduction process (Time-based competition, Quick Response manufacturing)	Research methods, Scope of work, principles/tools, contributions	Suggestions for future research
Erenguc, Simpson and Vakharia (1999)	Supply chain integration	Operations at different supply chain stages	Suggestions for future research
Govindan (2013)	Vendor-Managed Inventory	Operational dimensions, benefits, structure levels	Suggestions for future research
Marques, Thierry, Lamothe and Gourc (2010)	Vendor-Managed Inventory	Research methodology, proposed macro process	Suggestions for future research
This study	Quick Response	Forms of Quick Response, main issues	Suggestions for future research and practical application

The contributions of this study to the industries and academia are twofold. First, this study offers the conceptual basis used to represent Quick Response as the one of supply chain collaboration initiatives. While a quite large number of past studies focus on the limited definitions of Quick Response, this study identifies that this program requires a significant collaborative relationship between supply chain members. By implication, when Quick Response is implemented to the real industry, it should be managed as the collaboration program rather than a single company's individual operations.

Second, this study shed light on the potential of Quick Response to be a more advanced collaboration program. In the literature review, Quick Response found in the most past studies equips with merely a limited version of information sharing as its key collaborative feature. This study figures out the collaborative features that the current Quick Response misses, and provides the idea to develop a more advanced form of Quick Response, in which both business practitioners and academic researchers must be interested.

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