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Efficient Consumer Response Adoption at the Store-Level

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ABSTRACT

The Efficient Consumer Response (ECR) initiative is an industry-wide, collaborative effort to reengineer the grocery supply chain. While the success of ECR depends on widespread adoption, the details of ECR implementation will almost certainly differ across firms in any segment of the supply chain, across geographic and market divisions within individual firms, and even across product categories within a single firm. This paper reports findings from an exploratory study of ECR adoption in Minnesota grocery stores. Data were collected through a series of forty interviews with store managers. The overall objective was to describe ECR adoption in the retail store segment of the grocery supply chain. Three general conclusions can be drawn from this study. (1) Location in a major metropolitan area facilitates adoption of some components of the ECR initiative. (2) Stores that are part of a chain, especially a large corporate chain, are making faster progress toward implementation of ECR initiatives than are single stores. (3) ECR adoption and superior performance are closely associated.

KEYWORDS: Efficient Consumer Response, Vertical coordination, Food supply chain

INTRODUCTION

Efficient Consumer Response (ECR) is an industry-wide, collaborative effort to reengineer the grocery supply chain. ECR is aimed at increasing both intra- and interfirm efficiency and responsiveness to consumers. In the longer term, ECR is likely to have profound effects on the structure of the retail food industry, either through the strengthening of cooperation and coordination among independent firms or through increased vertical coordination.

While the success of ECR depends on industry-wide adoption, the details of ECR implementation will almost certainly differ across firms in any segment of the supply chain, across geographic and market divisions within individual firms, and even across product categories within a single firm. Such differences in implementation can be beneficial, since they are the basis for organizational learning and for ongoing identification of best management practices in the context of ECR. One the other hand, the feasibility of many ECR practices depends on having a critical mass of firms using them.

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This paper reports findings from an exploratory study of ECR adoption in Minnesota grocery stores. Data were collected through a series of forty interviews with store managers. The overall objective of the study was to describe ECR implementation in the retail store segment of the grocery supply chain in the Upper Midwest. Specific objectives were:

1. To describe the operational and organizational changes retail grocery stores are experiencing with the implementation of ECR.
2. To identify factors that may explain significant differences in patterns of ECR implementation across firms and across major product categories.

Issues of particular interest included: (1) the effects on inventory costs and efficiency in the use of labor and store space associated with changes in internal business processes, (2) changes in decision responsibility for activities such as inventory management, space allocation, and product assortment, and (3) differences in ECR implementation in retail store chains and single stores.

In the sections that follow, we first provide a brief introduction to the ECR initiative. We then describe the data collection procedures for this study and summarize the characteristics of the stores interviewed. Next, we present findings on ECR adoption and store productivity for stores grouped from three distinct perspectives: by location, by organizational form, and by the level of adoption for ECR practices. Each perspective provides unique insights on the ECR adoption process. In the concluding section, we summarize our findings and identify issues for future research.

THE ECR INITIATIVE

As originally articulated in a report prepared by Kurt Salmon Associates (1993), the ECR initiative focuses on four interrelated core processes in the retail food supply chain: (1) selection of product assortments, (2) product replenishment, (3) product promotions, and (4) new product introductions. The objective is to trim costs and waste, while continuing to serve the customer effectively. Often actions at one level of the chain affect costs at another. The ECR initiative focuses on the development of trading relationships and the coordination of investments and decisions across different levels of the supply chain.

King and Phumpiu (1996) describe a variety of new interfirm relationships that are being developed under the ECR initiative. These include the establishment of category management teams made up employees from two trading partners, shifting day-to-day replenishment decisions from a retailer to a supplier, and unbundling product and service costs to give trading partners incentives to consider the effects their actions have on each other. As firms experiment with these new relationships, questions emerge about who will participate and how the benefits will be shared. Our study of ECR adoption in Minnesota grocery stores provides some initial insights on the answers to these questions.

DATA COLLECTION PROCEDURES AND PARTICIPANT PROFILE

In the spring and summer of 1996 we conducted a series of forty interviews with store managers throughout Minnesota. Interview questions focused on: (1) store and manager characteristics; (2) inventory management and ordering processes; (3) store layout, shelf-space allocation, and product assortment; and (4) product pricing and promotion decisions. The forty stores interviewed for this study are not a representative, random sample of Minnesota grocery stores. Rather, they were chosen purposively to ensure a broad distribution of store sizes, locations, and types. Therefore, data collected in this study cannot

be used to make formal inferences about all stores in Minnesota or the broader U.S. market. Nevertheless, we believe our findings point to patterns of technology adoption and organizational change that are generally reflective of important trends in the industry.

In presenting our findings, we use three distinct store groupings. First, stores are grouped by location. Twenty-six of the stores in this study are in the Minneapolis-St. Paul metropolitan area; fourteen are in out-state locations. Some of the out-state stores are located in small rural communities. Others are in cities with populations that exceed 70,000.

Second, the stores are grouped by organizational form. Seventeen of the stores in this study are part of a corporate chain consisting of eleven or more stores. This category includes distributor-owned stores, franchise stores within distributor-owned chains, and stores that are part of a distributor-supplied chain with eleven or more stores. Eight of the stores are part of an independent chain with from two to ten stores. Finally, fifteen of the stores are independently owned and not part of a chain. In some cases, these independent stores share a common name and some aspect of their format with other stores served by the same distributor. In the case of corporate and independent chains, a conscious effort was made to select a single representative store or, if more than one store was selected from the same chain group, efforts were made to select stores considered to be significantly different, from a management standpoint, by the owners of that particular group of stores.

An "ECR readiness" score is the basis for the third scheme for grouping the stores in this study. This score is an unweighted adoption rate for seventeen technological, organizational, and management practices that are considered necessary for the implementation the ECR initiative. Some of these practices were identified from "best practice" publications prepared by the Joint Industry Project on Efficient Consumer Response — e.g., Efficient Consumer Response Performance Measures Operating Committee (1994) and Category Management Subcommittee of the Efficient Consumer Response Best Practices Operating Committee and the Partnering Group (1995). Others were included as a result of our own observations regarding technological, organizational, and management practices that were likely to differ across supermarkets. Adoption rates for individual practices vary from as low as 15% up to 100%. By construction, the index of ECR readiness equals 100% when a store implements all of the seventeen practices, and the index equals 0% when a store does not implement any of the practices. Higher ECR adopters are considered to be stores already practicing more than 75% of the seventeen store level ECR practices, moderate ECR adopters are stores that have implemented between 75% to 40% of the seventeen practices, and low ECR adopters are stores that have implemented fewer than 40% of the seventeen practices. There are eleven stores in the high ECR readiness group, fifteen in the moderate group, and fourteen in the low ECR readiness group.

FINDINGS

Phumpiu and King (1997) and Phumpiu (1997) present detailed summaries of findings from the forty store interviews. Only key results related to ECR adoption and store performance are presented here.

ECR Adoption

Percentage adoption rates for stores grouped by location, organizational form, and ECR readiness are presented in Table 1 for the seventeen technologies and practices that comprise the ECR readiness index. The first ten indicators — "scan merchandise" through "shelf tags have movement and/or reorder information" — pertain primarily to in-store

technology adoption and practices associated with efficient replenishment. The last seven indicators — “resets based on formal planograms” through “pricing/promotions coordinated with outside parties” pertain primarily to practices associated with category management and coordination of decisions with outside parties.

Table 1. ECR Readiness Indicators and Indices

ECR Readiness Indicators	Location		Organizational Form			ECR Readiness		
	Metro	Out-State	Corporate Chain	Independent Chain	Single Store	High	Moderate	Low
	Scan merchandise	83%	94%	100%	100%	67%	100%	100%
Scan coupons	33%	31%	41%	38%	20%	55%	20%	29%
Scan incoming shipments	46%	31%	53%	25%	33%	100%	33%	0%
Telxon units used for price verification	75%	88%	100%	75%	60%	100%	93%	50%
Manager has access to personal computer	8%	25%	29%	0%	7%	27%	20%	0%
Scanning coordinator trained on scan data quality	67%	50%	71%	63%	47%	91%	73%	21%
EDI transmission of orders	100%	94%	100%	100%	93%	100%	100%	93%
EDI transmission of movement data	100%	94%	94%	38%	33%	100%	73%	14%
Weekly sales forecasts based on POS data	63%	69%	100%	38%	40%	91%	87%	21%
Shelf tags have movement and/or reorder information	13%	31%	24%	13%	20%	27%	27%	7%
Resets based on formal planograms	21%	19%	24%	13%	20%	55%	7%	7%
Manager has category management training	42%	44%	65%	0%	33%	91%	40%	0%
Non-DSD resets coordinated with outside parties	46%	25%	71%	13%	13%	91%	33%	0%
Non-DSD assortment coordinated with outside parties	71%	44%	88%	75%	20%	100%	73%	14%
DSD resets/assortment coordinated with outside parties	42%	38%	71%	0%	27%	100%	27%	7%
Store uses competitor price information	71%	63%	88%	87%	40%	100%	87%	21%
Pricing/promotions coordinated with outside parties	71%	25%	65%	75%	27%	64%	60%	36%
ECR Readiness Index	53%	49%	70%	43%	35%	82%	56%	23%

For stores grouped by location, the average overall ECR readiness index is slightly higher for metro stores. However, the similarity in average levels for the overall index masks important differences for particular components of the index. There is no consistent pattern in adoption rate differences between metro and out-state stores for the indicators that pertain primarily to in-store technology and efficient replenishment practices. Stores outside the Minneapolis-St. Paul metropolitan area have higher adoption rates for scanning merchandise, using Telxon units for price verification, giving managers access to a personal computer, using weekly sales forecasts based on scanner data, and using shelf tags that have movement and/or reorder information printed on them. On the other hand, stores located in the metropolitan area are more likely to use backroom scanning to record incoming shipments, to train scanning coordinators in procedures that ensure scan data quality, and to use EDI for exchanging data with trading partners. Overall, out-state stores actually score slightly higher for this subset of ECR readiness indicators. In contrast, metro stores consistently score as well or considerably higher for the indicators that pertain primarily to practices associated with category management and coordination with outside parties. Stores in the two location categories have essentially the same adoption rate for the use of planograms, category management training, and coordination of DSD resets and product assortment with outside parties. Metro stores are much more likely to coordinate non-DSD reset and assortment decisions and pricing and promotions with outside parties.

In summary, while stores located outside the Minneapolis-St Paul metropolitan area may actually be more innovative in adoption of new technologies and practices that streamline in-store operations, stores located in the metropolitan area are more likely to coordinate activities with outside parties, such as a distributor or chain headquarters. We hypothesize that this is due to the simple fact that proximity lowers the transaction costs associated with establishing closer relationships with trading partners. In the long term, this may have important implications for the spatial uniformity of adoption of ECR practices and for the performance of retailers whose operations are far removed from the offices of their trading partners. New communication technologies may lessen this location effect, but they are not likely to eliminate it.

For stores grouped by organizational form, there is a large disparity between the average overall ECR readiness index for stores that are part of a corporate chain and the overall indices for single stores and stores that are part of an independent chain. With the exception of the last indicator — coordination of pricing and promotion decisions with outside parties — corporate chain stores always have the highest adoption rate. The difference is especially dramatic for EDI transmission of movement data, training in category management, and coordination of DSD resets and product assortment decisions with outside parties. Comparing stores that are part of an independent chain to single store, there is only a slight difference in the overall ECR readiness index. Differences in adoption rates are sizeable for individual indicators, however, though there is no clear pattern in these differences.

We hypothesize that the ability to spread the fixed costs of adopting new technologies and practices over larger stores and a larger number of stores may explain the higher level of ECR readiness in stores that are part of a corporate chain. For example, the average corporate chain store in our sample is considerably larger, carries many more items, and has a higher sales volume than the average store in the other two organizational forms (Phumpiu and King, 1997, p. 7). This makes it easier to recover the fixed costs of investing in new technology, such as that required to use scanning to record incoming shipments. Similarly, costs can be considerable for acquiring or developing systems that generate sales forecasts using scanner

data and training managers to use them. Here large chains have an advantage because these costs need only be incurred once, whether for a single store or for many stores.

Finally, for stores grouped by ECR readiness, averages for the overall ECR readiness index and for individual indicators are expected to be consistent with the high, moderate, and low ECR readiness groupings. For many indicators, the differences in average adoption rates are large for stores in the high and low groups. These differences appear to be more consistently large for the last seven indicators — those that pertain primarily to practices associated with category management and coordination with outside parties. On the other hand, the differences are smaller for scanning merchandise (a mature technology), for the use of EDI to transmit orders (which is usually required by suppliers), and for scanning coupons (a relatively new technology).

Store Performance

Ultimately, the success or failure of the ECR initiative will depend on the impact it has on performance in each segment of the retail food supply chain. During the interviews, we collected data that could be used to construct estimated values for three important store productivity measures: sales per labor hour, weekly sales per unit of selling area, and annual inventory turns. The sales per labor hour measure was calculated by dividing weekly sales, as reported by the manager, by an estimate of weekly labor hours constructed under the assumption that full-time employees work 40 hours per week and part-time employees work 20 hours per week. The weekly sales per unit of selling area measure was calculated by dividing weekly sales by store selling area, using figures reported by the store manager. Finally, annual inventory turns was calculated by dividing annual sales — weekly sales as reported by the manager multiplied by 52 — by the average inventory value reported by the manager. The values we calculated for these measures are only approximations. Therefore, they should be interpreted with caution. Also, it should be noted that two of the forty store managers interviewed did not provide the financial information needed to construct these productivity measures.

Summary information on store productivity measures is presented in Table 2. There are relatively clear differences under each of the three descriptive profiles. On average metro stores perform better for each measure than do out-state stores. Lower sales per labor hour and weekly sales per unit of selling area in out-state stores may partly reflect lower labor and real estate costs in those areas. Turning next to summary figures for stores grouped by organizational form, corporate chain stores have the best average performance measures. Labor efficiency in independent chain stores approaches that of the corporate chain stores, and both have much higher sales per labor hour than do single stores. In contrast, both independent chain stores and single stores have similar average values for annual inventory turns, and both perform at levels well below the average realized by corporate chain stores. Perhaps the most striking differences in average productivity levels are those seen across ECR readiness categories. For each measure, the average performance level for stores in the low ECR readiness group is only about half the average level for stores in the high ECR readiness group. The differences are least striking for labor productivity. This may reflect the fact that some ECR practices add to labor requirements at the store level. Finally, it is not possible to determine whether adoption of ECR practices leads to better performance or strong performance facilitates adoption of ECR practices. It is clear from these findings, however, that there is a strong association between adoption of ECR practices and superior performance. This adoption-performance link is not observed only for chain stores. In fact, three of the most innovative and efficient stores were single stores operated by their owners.

Table 2. Store Productivity Measures

Productivity Measure	Location		Organizational Form				ECR Readiness		
	Metro	Out-State	Corporate Chain	Independent Chain	Single Store	High	Moderate	Low	
Sales per labor hour (\$/hr)	109.08	87.37	116.77	114.39	75.39	124.01	104.61	78.07	
Weekly sales per unit of selling area (\$/m ²)	113.45	93.75	133.69	105.49	76.42	146.93	115.17	65.23	
Annual inventory turns	27	22	30	23	22	37	26	16	

SUMMARY AND IMPLICATIONS FOR FUTURE RESEARCH

The findings presented in this paper are based on structured, but open-ended interviews with managers of forty Minnesota grocery stores. The stores ranged from very small independently owned and operated grocery stores to large supermarkets that are part of corporate chains, from stores located in the Minneapolis-St. Paul metropolitan area to stores located in small rural towns, and from stores that are well on the way to implementing a wide range of practices associated with the ECR initiative to stores that are still using more traditional technologies and business practices. While not a random, representative sample, these stores do represent a broad cross section of Minnesota grocery stores.

While we believe the primary value of our findings is in the details, there are three general conclusions that can be drawn from this study.

1. Location in a major metropolitan area makes an important difference in implementing some components of the ECR initiative. On average, metro and out-state stores differ little with respect to store size or the adoption of technologies than support the ECR initiative. Metro and out-state stores differ significantly, however, in the degree to which they coordinate their activities with outside trading partners.
2. Stores that are part of a chain, especially a large corporate chain, are making faster progress toward implementation of ECR initiatives than are single stores. This is to be expected, since large chains are able to spread the fixed costs of ECR adoption over a larger number of stores. It is also interesting to note, however, that three independently owned single stores were among the most innovative of those we visited. In these stores, it appears that a visionary, energetic owner/manager is able to quickly respond to new opportunities.
3. ECR adoption and superior performance are closely associated. We cannot be sure whether one of these factors "causes" the other. We can conclude, however, that competitive forces will almost certainly drive more stores toward adoption of a wider range of technologies and business practices that support the ECR initiative.

The findings from this study reflect trends for a small number of stores in a limited geographic area. Our conclusions should, perhaps, best be viewed as hypotheses that need to be tested through survey research that collects data from a larger, more representative cross section of stores throughout the country. Based on the experience we gained through the interviews conducted for this study, we believe data to test these hypotheses can be collected using a carefully designed survey instrument. We also believe more attention needs to be given to collecting accurate data on a wider range of store performance measures, since improved efficiency and responsiveness to customers is the objective of ECR. Finally, if possible, a panel of firms should be surveyed periodically to gain a better understanding of the dynamics of ECR adoption and its relationship to store performance.

In closing, it is clear that, in one way or another, grocers are reinventing their stores in order to compete in a rapidly changing market. Scale economies realized through increasing store size or through replicating a format in multiple stores within a chain influence store investments in physical layout, new technologies, and information systems. Size is not the only factor in this transformation of the industry, however. Our results also suggest that stores of any size and organizational form that are willing and able to adopt new technologies, develop cooperative relationships with their trading partners, and

respond to the unique needs of their customers will be more likely to succeed in this competitive market.

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