Understanding the Diffusion of Efficient Consumer Response in Australia: A Survey Study

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Abstract

Efficient Consumer Response (ECR) is a grocery industry supply chain management strategy designed to make the industry more efficient and responsive. Although ECR originated in the US, the concept has been adopted in many regions. Despite the many potential benefits obtainable from ECR, however, many studies indicate that the ECR diffusion rate has been slow, which is attributable to a number of factors. To enrich the findings of the studies conducted in the US and Europe in this respect, this paper examines ECR adoption in Australia, which presents another unique case. For this purpose, a survey of the Australian grocery industry was conducted. The findings suggest that in Australia, ECR diffusion has also been slow. Differences in barriers, perceptions of ECR, and benefits experienced were discovered among different sub-groups within the retail industry, which affect their ECR involvement level, satisfaction level, and ultimately the ECR diffusion rate. These differences further suggest that manufacturers are largely passive followers of an ECR initiative led by retailers.

Keywords: Efficient Consumer Response, Supply Chain Management, Exploratory Research, Survey, Innovation, Australia.
Introduction

Efficient Consumer Response (ECR) originated in the United States in late 1980’s and early 1990’s (Tripplet 1995), as a direct response to threats from alternative store formats which were taking market share away from the major supermarket chains. In order to survive, a group of U.S. grocery industry leaders attempted to learn how these alternative store types were carrying out their business activities and re-examined current supermarket practices to improve their competitiveness. This study led to the development of a new approach, known as Efficient Consumer Response (ECR). The term ‘ECR’ was first introduced at the Food Market Institute Conference in the U.S. in January 1993 (Robin 1994). ECR proposes various reforms to business procedures across the grocery supply chain, through collaboration and the use of a set of inter-organisational IT infrastructure initiatives.

ECR has the potential to remove significant costs from the grocery supply chain through the elimination of non-value-added activities, which will in turn, result in reductions in operating costs and inventory levels, and an increase in efficiencies at all levels within the supply chain (Tripplet 1995). All this will ultimately allow the industry to offer greater value to the grocery consumers through the provision of better prices, better store assortment, better service, better convenience, and better quality products (Kurt Salmon Associates 1993; Wood 1996). The ability to provide greater value to consumer is crucial for industry survival, since competition has become more intense and consumers have gained more power. Therefore, the concept of ECR has attracted many other regions, noticeably European countries and Australia, with different motivations from the US (Leggett 1996; Wheatly 1997; Kurnia 1997).

However, despite the benefits and potential savings obtainable from ECR, a number of studies indicate that the diffusion rate of the concept has been slow in the US and Europe (Kurt Salmon Associates 1995; Leggett 1996; Coopers and Lybrand 1997a; Greenbaum 1997; IBM 1997; Kurt Salmon Associates 1997). There are a number of factors influencing the diffusion of ECR. They include:

- The existence of organisation environmental barriers. These barriers may vary from one company to another, depending on the position of a company in the supply chain, the geographic location, and the size of the company (Greenbaum 1997; Porter 1997).

- Perception of ECR characteristics. These can be viewed in terms of the relative advantage of ECR, compatibility of the ECR concept with the current practices of the potential adopters, trialability of ECR components, observability of the benefits, complexity of the concept, switching costs, and risks of adopting the concept (Rogers 1983; Fidler and Johnson 1984; Frambach 1993). The less favourably the potential adopters perceive these ECR characteristics, the less likely they adopt the idea, despite the potential benefits reported from the studies.

- Realisation of ECR benefits. The more companies gain real benefits of ECR, the more companies will be committed to ECR, which will, in turn, affect the ECR diffusion (Anonymous 1994).

Study of ECR diffusion is not well developed at present. Differences in the retail industries and the environments of different countries should be exploited to increase understanding of the relative importance of various driving forces and the above three factors to ECR diffusion and adoption. Australia has a very different market structure to other countries, in which the consumers are fewer in number and dispersed over a wide geographical area. In addition, the impetus for ECR adoption is different from that of the US and Europe. Competitive pressure from alternative store formats is not present in this country. The Australian grocery industry is dominated by very few key players which
constitute the “big five” Australian retailers. The general motivation to embrace ECR, therefore, appears to be pressure from these large retailers. Other companies within the industry were forced to get involved in ECR, regardless their perceptions of the concept. This uniqueness of the Australian grocery industry enables Australian studies to potentially enrich the findings of other studies in different countries, to better understand the ECR diffusion process in general.

The research reported in this paper, therefore, aims to define the extent of ECR implementation in Australia and to identify the barriers to ECR adoption, perception of ECR characteristics and the realisation of ECR benefits in Australia. For these purposes, a survey of the Australian grocery industry was performed. In addition, in this study, we specifically wanted to test the following two hypotheses:

1. In Australia, retailers are leading manufacturers in the ECR implementation.
2. Australian retailers gained more benefits from ECR than manufacturers.

The responses to the survey were analysed for the Australian retail industry as a whole. In addition, differences and similarities among a number of binary sub-groupings within the industry were also examined. Three such candidate sub-groupings were considered: ‘Type of Company’ (Manufacturer versus Retailer); ‘Size of Company’ (SME versus Large Company); and ‘ECR Involvement Level’ (Actively Involved and Undecided). The last two variables were found to be strongly correlated leaving two sub-groupings for the subsequent analysis. The survey findings suggest that, as in the US and Europe, the ECR diffusion rate is low in Australia. Furthermore, the results of the analysis demonstrate that different sub-groups differ in relation to barriers to ECR implementation, perception of ECR characteristics and the benefits gained, in such a way that they support the above two hypotheses.

In the next section, we provide a more detailed description of ECR as a grocery supply chain management initiative, as well as the components of ECR. We next describe the survey research method employed in this study, and then discuss the survey findings comprehensively. Finally, we conclude the paper by outlining the limitations to this study and suggesting some related future research.

ECR as a Grocery Supply Chain Management Initiative

Efficient Consumer Response (ECR) is defined as "a complex management theory that calls for changes in nearly all grocery work processes and practices to make the industry more efficient and responsive to consumers' needs" (Tripplet 1995, p.3). It is designed to re-engineer the grocery supply chain away from the current push system, in which manufacturers “push” products to store levels, towards a pull system, in which products are “pulled” by consumer demand captured at the point of sale (POS). ECR can thus be considered as a grocery industry supply chain management strategy with an objective to improve efficiency and effectiveness of the business processes involved within the supply chain in order to deliver better value to grocery consumers (Harris and Swatman 1997).

Figure 1 depicts the vision of ECR in which products can be brought smoothly and continuously from manufacturer to consumer, as a result of timely, accurate and paperless information flowing from consumer back to manufacturer (Kurt Salmon Associates 1993). Partnerships among participants of a supply chain play a crucial role in achieving the vision of ECR, because they have the potential to create a win/win environment. Such an environment allows timely and accurate information flow and high-quality products flow within the supply chain (Kurt Salmon Associates 1993; Martin 1994).
ECR consists of three layers: strategic initiatives, operational programs and enabling technologies. The strategic initiatives promoted by ECR are based on four areas: store assortment, promotion, product introduction, and product replenishment (Kurt Salmon Associates 1993):

- **Efficient store assortment**
  This initiative is aimed at optimising the productivity of inventory and shelf management at the store level.

- **Efficient product introduction**
  The objective of this initiative is to maximise the effectiveness of new product development and introduction activities, in order to reduce costs and failure rates in introducing new products.

- **Efficient promotion**
  This initiative aims at maximising the total system efficiency of trade and consumer promotions. This can be achieved by introducing better alternative promotions, such as Pay for Performance or Every Day Low Price program.

- **Efficient product replenishment**
  The objective of this initiative is to optimise time and cost in the replenishment system by the provision of the right product to the right place at the right time in the right quantity and in the most efficient manner possible. This initiative is similar to the Just-In-Time strategy of the manufacturing supply chain.

These four initiatives are supported by two operational programs, namely, Category Management (CM) and Continuous Replenishment Program (CRP):

- **Category management**
  Category management supports the first three initiatives of ECR discussed above. It is an interactive business process in which retailers and manufacturers work together to manage categories as strategic business units within each store (Information Advantage 1996).

- **Continuous replenishment program (CRP)**
  This program supports the efficient product replenishment initiative. CRP is the practice of partnering among members of a distribution channel whereby the manufacturer monitors the withdrawal of goods from the retailer’s warehouse and has the responsibility to replenish the retailer’s inventory (Thayer 1995).
Figure 2 summarises all ECR components and their relationships. As the figure shows, the operational programs are, in turn, supported by a number of enabling technologies: barcode/scanner, Electronic Data Interchange (EDI), Computer Aided Ordering (CAO), cross-docking, and Activity Based Costing (ABC):

- **Barcodes / Scanners**
  The use of barcodes and scanners is a fundamental component for ECR implementation in the grocery industry as it allows accurate and faster information capture to be obtained, which in turn can be shared with trading partners (EAN Australia 1997).

- **Electronic Data Interchange (EDI)**
  Electronic Data Interchange (EDI) is defined by Emmelhainz (1990) as an inter-organisational exchange of business documents in a structured, machine-processable form. Besides purchase orders and invoices, another common business document exchanged electronically in the grocery industry is the Advance Shipping Notice (ASN) — the EDI message which precedes the arrival of pallets at their destination.

- **Computer-Aided Ordering (CAO)**
  Computer Aided Ordering (CAO) is an ordering system that automatically generates orders for replenishment when the inventory level drops below a pre-determined reorder level (ECR Central 1997).

- **Cross-Docking**
  Cross-Docking or “Flow-Through Distribution” is a direct flow of products at the distribution centre from receiving to shipping, thus eliminating additional handling and storage steps in the distribution cycle (Andel 1994).
• Activity-based costing

Activity-Based Costing is a new costing tool which works on the principle that activities (as opposed to product volumes or labour in traditional accounting) are what really affect costs. ABC offers a better understanding of how profits are generated, as it increases the visibility of costs in a particular environment. It can be used to gain top management commitment and leadership to support the implementation of ECR and its key components (Landry 1997).

The Survey Research Method

We decided that a mail survey would be the most appropriate method of achieving the aims of the study, because this would allow us to reach a wide range of organisations within the Australian grocery industry. Managers, or any individual with specific knowledge on ECR-type implementations, were requested to answer the questionnaire. An initial survey letter, seeking participation from the target population, was sent to 1000 companies. The mailing list of these organisations was obtained from the Grocery Industry Marketing Guide 1998, ignoring all duplicates (Retail World 1998).

Of the 1000 companies in the mailing list, only 52 companies indicated their willingness to participate in the survey. The probable reason for this low response rate (5.4%) is that few Australian grocery industry firms are as yet involved and interested in ECR. In addition, some companies already involved in ECR indicated that they had participated in the recent ECR study conducted by Coopers and Lybrand (1998) with different objectives to this study and, therefore, were not willing to participate in another study.

Before sending out the questionnaire to the sample population of 52 companies, pilot tests were conducted with a logistics researcher and a practitioner who resembled the actual respondents to whom the questionnaire would be sent. The final version of the questionnaire was then sent out to those 52 participants. After two follow-ups were made via mail and phone, the number of returned questionnaire was 42.

The questionnaire item generation was derived from a literature review on ECR, supply chain management, and diffusion of organisational innovation. Some items were adapted from the survey questionnaire of Kurt Salmon Associates for the US and European ECR progress study, since it is desirable to replicate existing well developed questionnaires in survey research (Lucas 1991). In addition, in keeping with the recommendations of Jackson (1998) and Fowler (1998), the use of open-ended questions in the questionnaire was limited to the question of the annual sales of the participants. The rest of the questions were closed-type questions which could be answered by simply ticking a circle. Whenever appropriate, the Likert-scale was used in the questionnaire.

Data Analysis

Simple statistical analysis methods such as frequency of each response were used for nominal data. Because of the small sample size, an exact hypothesis test for the difference between binomial proportions was used for nominal data. In some cases, Likert-scale responses were converted to numerical values using a linear scale from 1 to 5. While differences between groups were observed using means, which were found to be sensitive to small differences, the Mann-Whitney test for the difference of medians, based on the rank of responses, was used for significance testing of ordinal data.

The survey data allowed us to define sub-groups of the sample according to the following variables,
which were aggregated to two-point scales to improve the statistical significance of the results.

- **Type of Company**, which consists of two aggregated groups: ‘Manufacturer/Broker’ and ‘Retailer/Distributor/Wholesaler’. This classification is based on the position of the companies within the supply chain – the upstream (supply) party and the downstream (distribution) party. For simplicity, these categories are sometimes referred to as simply ‘Manufacturer’ and ‘Retailer’ in this paper.

- **Size of Company**, which consists of: ‘Small to Medium Sized Enterprises (SME)’ and ‘Large’. This classification is based on the annual sales of the company, in which companies with annual sales of less than $100 M is considered as SMEs, and the ones with annual sales of more than $100 M are considered as large enterprises.

- **ECR Involvement Level**, which consists of ‘Actively Involved’ and ‘Undecided’. The first category is for those companies who have fully implemented or are currently implementing ECR, while the second category is for those who are still considering the ECR implementation or not sure about it.

Independence between these candidate variables was tested using the Chi-square test which showed that there was a significant correlation between the ‘ECR Involvement Level’ and ‘Size of Company’ variables (Chi-square = 7.630, Degrees of Freedom, P-Value = 0.006). The null hypothesis was, therefore, rejected at the 99% level. Thus, either one of these two variables could be used in the analysis. For the purpose of this study, we decided to use ‘Type of Company’ and ‘ECR Involvement Level’ (whenever appropriate) as the independent variables in the analysis. Having these two variables allowed us to examine how the position of a company along the supply chain and the ECR involvement level affect barriers to ECR implementation, perception of ECR characteristics, and benefits experienced.

**The Survey Findings and Discussion**

**Demographic Information**

Table I depicts the locations of the participants and the numbers of questionnaires sent to each location, as well as the numbers of questionnaires returned from each location. The majority of participants are located in the two most densely populated states: New South Wales (NSW) and Victoria (VIC). The 42 respondents consist of 59% manufacturers, 14% brokers, 7% retailers, 10% wholesaler and 10% retailers, as shown in Table II.
Figure 3 shows the distribution of the annual sales of the respondents. Seventy percent of the respondents are SMEs, with an annual sale below $100 million in the last financial year, and 30% of the participants are large enterprises.

![Figure 3. Annual Sales of Respondents](image)

**ECR Involvement Levels**

To obtain the ECR involvement level of the participants, participants were asked to describe their level of ECR involvement from the following options: ‘Fully Implemented’, ‘Currently Implementing’, ‘Considering’, ‘Not Sure’, or ‘Not Involved’. Figure 4 depicts the ECR involvement levels of the respondents. Only two respondents (5%) have fully implemented ECR, 17 respondents (40%) are currently implementing, four respondents (10%) are considering, two (5%) are not sure whether they are involved in ECR, and 17 respondents (40%) are not involved in ECR at all. This gives us a total of 25 participants who are most likely able to provide us with useful responses for detailed ECR questions in the questionnaire.

![Figure 4. ECR Involvement Level of the Sample](image)

Some reasons for non-involvement have also been identified from the responses of those 17
participants. Participants were allowed to choose more than one reason for non-involvement from a list of possible options. Table III below depicts the ten most commonly cited reasons by the respondents. It is worth noting that none of the respondents believe ECR is a passing fad. The most frequently cited reason (cited by 65% of the respondents) is ‘Do Not Understand ECR’, suggesting that ECR is not widely understood in Australia.

<table>
<thead>
<tr>
<th>Reasons (n=17)</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Do Not Understand ECR</td>
<td>65</td>
</tr>
<tr>
<td>Other Priority More Important</td>
<td>41</td>
</tr>
<tr>
<td>Lack of IT Infrastructure</td>
<td>35</td>
</tr>
<tr>
<td>Shortage of Skilled Personnel</td>
<td>29</td>
</tr>
<tr>
<td>Customers/Suppliers are Not Interested</td>
<td>18</td>
</tr>
<tr>
<td>Costs Outweigh Benefits</td>
<td>18</td>
</tr>
<tr>
<td>Lack of Financial Resources</td>
<td>18</td>
</tr>
<tr>
<td>No Commitment From Senior Management</td>
<td>12</td>
</tr>
<tr>
<td>ECR is Too Complex</td>
<td>12</td>
</tr>
<tr>
<td>Concerns with the Risks Involved</td>
<td>6</td>
</tr>
</tbody>
</table>

Table III. Reasons for Not Being Involved in ECR

Further analysis was carried out to discover if there were any differences in responses between the upstream and downstream parties within the supply chain. Both manufacturers and retailers cited ‘Do not understand ECR’ as the main reason for not being involved. Other common reasons cited by manufacturers include ‘Other priority more important’, followed by ‘Lack of IT infrastructure’, ‘Lack of financial resources, and ‘No commitment from senior management’. This suggests that manufacturers are not particularly interested in ECR. For retailers, diverse answers spread over the reasons shown in Table III were given. Interestingly, ‘Lack of financial resources’ and ‘No commitment from senior management’ were not cited by any of the retailers. This suggests that those retailers who are not involved in ECR are prepared to devote their financial resources to ECR once they gain adequate understanding of the concept.

The Driving Forces

From the other 25 participants, a number of driving forces to get involved in ECR have been identified, as shown in Table IV. The analysis indicates that for manufacturers, the major driving force is exogenous, whereas for the retailer it is endogenous. This finding reinforces the idea that in most supply chains, retailers are the ones who initiate the ECR program in order to improve their internal operations. Most manufacturers simply embraced the concept of ECR just to meet the requirement of their larger trading partners in order to stay in business.

Similar analysis was also conducted to scrutinise the differences in ECR driving forces for ECR involvement between those who are actively involved and those who are still undecided. The results demonstrate that both groups are pressured by trading partners to get involved in ECR. However, those who are actively involved in ECR also have perceived needs to improve their business operations, while there are very few undecided companies perceived such needs, as depicted in Table IV.
Table IV. ECR Catalysts

Implementation Level of ECR Components

To measure the ECR implementation level, participants were requested to describe their current implementation status with the ECR components from a range of responses: ‘No plan to implement’, ‘Keen to explore further’, ‘Plan to begin in 12 Months’, ‘In testing/pilot stage’, and ‘Fully operational’. For each component, they were also asked to indicate if they were pursuing the component as part of ECR. Figure 5 depicts the proportion of manufacturers and retailers who are actively pursuing the components, defined as either testing them or having fully implemented them.

The results demonstrate that a relatively large proportion of manufacturers and retailers are actively pursuing ECR components. Retailers, however, are much more enthusiastic than manufacturers about the Continuous Replenishment Program and Computer Aided Ordering implementations. This suggests that retailers are more concerned with overall supply chain management than manufacturers. These differences, however, are not statistically significant at 5%. Although the results suggest a high implementation level for most of the ECR components, most manufacturers indicated that they were pursuing each component not as part of the ECR program. Half of the retailers indicated that they were involved in CRP, EDI, and cross docking as part of the ECR program. This finding again supports our hypothesis that retailers are leading the ECR implementation in Australia, and
manufacturers only attempt to conform to the retailers’ requirement.

Figure 6 shows that there are more retailers than manufacturers who plan to begin pursuing the ECR components within 12 months and some of these differences are significant at 5% level. The most prominent component to be pursued is EDI, followed by CRP, CAO, and cross docking. Manufacturers, by contrast, seem to be more interested in pursuing ABC than retailers. This suggests that manufacturers are more sceptical about the ECR concept than retailers, and therefore, they plan to conduct Activity Based Costing to investigate if ECR is indeed beneficial.

![Figure 6: Plan to Get Involved in 12 Months by Company Type](image)

\[ n_{\text{man}} = 19; \ n_{\text{ret}} = 6 \]

\* Difference between the two groups is significant at 5% level

A further analysis was also conducted to investigate the implementation level of ECR components as a function of ECR involvement level. The results indicate that some companies who are undecided have implemented a number of ECR components, although in most cases, the proportion of this group is less than the proportion of those who are actively involved in ECR. These differences are significant at 5% level for barcode and CAO implementation, as depicted in Figure 7. Almost all companies of this category are actively pursuing ECR components but not as part of an ECR program and less than 50% of those companies who are actively involved implement ECR components as part of the ECR program. A large number of undecided companies are pursuing Activity Based Costing to gain better understanding on how ECR can remove costs. Companies in this category do not plan to implement most of the ECR components in the next 12 months.
\( n_{\text{involved}} = 19; n_{\text{undecided}} = 6 \)

* Difference between the two groups is significant at 5% level

**Figure 7. Actively Pursuing ECR Components by ECR Involvement Level**

*Satisfaction Level with the ECR Initiatives*

Participants were asked to describe their satisfaction level with the four ECR initiatives based on the following 5 scales: -1 = very disappointed; -0.5 = disappointed; 0 = neutral; 0.5 = satisfied; 1 = very satisfied. The means of the responses were calculated and are presented in Table V and the Mann-Whitney test was performed to test the significance of differences between manufacturer and retailer responses.

The findings suggest that retailers are more satisfied with the ECR initiatives, particularly the Efficient Promotion and Efficient Product Introduction initiatives. Manufacturers, on the other hand, show a very low satisfaction level, suggesting that most of them were driven by retailers to get involved in ECR, without any particular interest.

<table>
<thead>
<tr>
<th>Efficient Store Assortment (( n_{\text{man}} = 18; n_{\text{ret}} = 5 ))</th>
<th>Efficient Promotion (( n_{\text{man}} = 19; n_{\text{ret}} = 5 ))</th>
<th>Efficient Product Introduction (( n_{\text{man}} = 19; n_{\text{ret}} = 5 ))</th>
<th>Efficient Product Replenishment (( n_{\text{man}} = 17; n_{\text{ret}} = 5 ))</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Manufacturer</strong></td>
<td>-0.11 *</td>
<td>-0.05</td>
<td>0.13</td>
</tr>
<tr>
<td><strong>Retailer</strong></td>
<td>0.20 *</td>
<td>0.40</td>
<td>0.40</td>
</tr>
</tbody>
</table>

* Scale: -1 = very disappointed; -0.5 = disappointed; 0 = neutral; 0.5 = satisfied; 1 = very satisfied

* Difference between Manufacturer and Retailer groups is significant at 5% level

**Table V. The Mean of the Satisfaction Level with the ECR Initiative by Company Type**

*Attitude of Management Functions and Trading Partners*

Participants were requested to describe the overall attitude of various management functions and their trading partners towards ECR, 12 months ago and today, based on 5 point scales: from very negative (-1) to very committed (1). Table VI summarises the means of the responses by company type and ECR involvement level and again, the Mann-Whitney test was carried out to test the significance of differences between sub-groups and between years.

| Management Functions | Manufacturer (\( n=19 \)) * | Retailer (\( n=6 \)) * | ECR Involvement Level | | | | |
|---|---|---|---|---|---|
| | 12 Months Ago | Today | 12 Months Ago | Today | 12 Months Ago | Today | 12 Months Ago | Today |
| Senior Management | 0.47 \(^{ab} \) | 0.71 \(^a \) | 0.58 \(^b \) | 0.92 | 0.53 \(^a \) | 0.84 \(^{bc} \) | 0.42 | 0.50 \(^b \) |
| Marketing/Merchandising | 0.58 \(^a \) | 0.63 | -0.01 \(^b \) | 0.25 | 0.45 | 0.61 | 0.33 | 0.33 |
| Logistics /Distribution | 0.48 | 0.68 | 0.63 | 0.88 | 0.61 \(^c \) | 0.83 \(^{bc} \) | 0.10 \(^c \) | 0.30 \(^c \) |

12
Table VI. The Mean of the Attitude of Management Functions and Trading Partners

<table>
<thead>
<tr>
<th></th>
<th>0.27</th>
<th>0.53</th>
<th>-</th>
<th>-</th>
<th>0.46</th>
<th>0.67c</th>
<th>-0.13</th>
<th>0.25c</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Manufacturing</strong></td>
<td>0.21</td>
<td>0.54</td>
<td>0.50</td>
<td>0.75</td>
<td>0.40</td>
<td>0.68</td>
<td>0.00</td>
<td>0.40</td>
</tr>
<tr>
<td><strong>Retail Outlets</strong></td>
<td>0.44b</td>
<td>0.72</td>
<td>0.83b</td>
<td>0.92</td>
<td>0.60</td>
<td>0.82c</td>
<td>0.30</td>
<td>0.60c</td>
</tr>
<tr>
<td><strong>Total (Average)</strong></td>
<td>0.41</td>
<td>0.64</td>
<td>0.46</td>
<td>0.70</td>
<td>0.50</td>
<td>0.73</td>
<td>0.19</td>
<td>0.46</td>
</tr>
<tr>
<td><strong>Trading Partners</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Large Suppliers</strong></td>
<td>0.47</td>
<td>0.44b</td>
<td>0.58</td>
<td>0.83b</td>
<td>0.61c</td>
<td>0.62</td>
<td>0.17</td>
<td>0.33</td>
</tr>
<tr>
<td><strong>Small Suppliers</strong></td>
<td>0.17b</td>
<td>0.32b</td>
<td>-0.33b</td>
<td>-0.08b</td>
<td>0.03</td>
<td>0.23</td>
<td>0.08</td>
<td>0.17</td>
</tr>
<tr>
<td><strong>Large Customers</strong></td>
<td>0.63</td>
<td>0.83</td>
<td>0.63</td>
<td>0.63</td>
<td>0.65</td>
<td>0.78</td>
<td>0.58</td>
<td>0.83</td>
</tr>
<tr>
<td><strong>Small Customers</strong></td>
<td>0.08</td>
<td>0.29b</td>
<td>-0.33</td>
<td>-0.17b</td>
<td>0.09</td>
<td>0.20</td>
<td>-0.20a</td>
<td>0.30a</td>
</tr>
<tr>
<td><strong>Total (Average)</strong></td>
<td>0.34</td>
<td>0.47</td>
<td>0.14</td>
<td>-0.10</td>
<td>0.35</td>
<td>0.46</td>
<td>0.16</td>
<td>0.41</td>
</tr>
</tbody>
</table>

Scale:
-1 = Very Negative; -0.5 = Somewhat Negative; 0 = Not Committed; 0.5 = Somewhat Committed; 1 = Committed

* Not all respondents indicated the attitude of all management functions and their trading partners toward ECR
  a Difference between 12 months ago and today is significant at 5% level
  b Difference between Manufacturer and Retailer is significant at 5% level
  c Difference between Actively Involved and Undecided is significant at 5% level

In general, there has been an improvement in the attitude of the management functions and trading partners for all parties in the last 12 months, indicating that all parties are becoming more convinced and fervent about the ECR program. A further look at the means of the responses indicated that the finance functions of manufacturers and those companies undecided about ECR are less committed than other management functions.

The results also suggest that, in general, the management functions of retailers are more committed than manufacturers and most of the differences in attitude are significant at 5% level, consistent with our hypothesis that retailers are leading manufacturers. Interestingly, the findings indicate that the marketing/merchandising function of retailers has a very low commitment. The probable reason for this is that this management function is the one that interacts directly with manufacturers, who in general, are not very fervent about ECR.

Similarly, the management functions of those companies actively involved in ECR are more enthusiastic than those who are undecided, and many of the differences in attitude are statistically significant. Only the IT function and the retail outlet of those who are still undecided show a favourable attitude. This result suggests that large trading partners have a major influence in the ECR implementation of other companies. In addition, small trading partners for most parties, noticeably those of retailers, show a very unfavourable attitude towards ECR. This again provides an evidence that manufacturers are being led by retailers.

Implementation Problems

A number of implementation problems have also been identified from the survey. Table VII depicts the top six problems encountered by manufacturers and retailers. The similarities in the responses indicate that both groups experience ‘Conflicting priorities for resources’, ‘Shortage of personnel with necessary skills’, and ‘Inflexible Information Systems’ as three of the major barriers to ECR.
implementation. The differences in the responses indicate that manufacturers and retailers have different implementation concerns. Other major problems indicated by manufacturers are related to the pressure enforced by retailers. They include the problem of lack of a clear roadmap in their ECR implementation and lack of training for their category managers. The problem of information sharing experienced by manufacturers indicates that retailers still have low level of trust in manufacturers. This last problem is consistent with the problems of ‘Resistance to change’ faced by retailers. For retailers, by contrast, the other barriers are all internal barriers, such as ‘Functional territory issues’ and ‘Inaccurate / inappropriate performance measures’.

An analysis has also been performed to examine the differences in implementation barriers experienced by those companies actively involved and anticipated by those who are undecided. Interestingly, both groups cited ‘Shortage of personnel with necessary skills’, ‘Conflicting priorities for resources’, and ‘Inflexible Information Systems’ as the three most severe problems. However, those companies who are undecided describe each problem more severely than those who are actively involved. This implies that the ECR implementation barriers are not as severe as anticipated by those companies with a ‘wait-and-see’ attitude.

**The Consequences of Adoption**

Table VIII shows the experience of manufacturers, retailers, companies actively involved in ECR, and those who are undecided. Only retailers and those actively involved in ECR experienced that ECR exceeded their expectation. For those who are actively involved and undecided, the differences in their experiences of whether ECR meets their expectation are significant at 5% level. This suggests that those who are actively involved in ECR are satisfied with the program, while those who are undecided are sceptical about it.

<table>
<thead>
<tr>
<th>Company Type</th>
<th>ECR Involvement Level</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Company Type</strong></td>
<td><strong>Manufacturer (n=19)</strong></td>
</tr>
<tr>
<td><strong>Failed to Meet Expectation</strong></td>
<td>47%</td>
</tr>
<tr>
<td><strong>Met Expectation</strong></td>
<td>53%</td>
</tr>
<tr>
<td><strong>Exceeded Expectation</strong></td>
<td>0% *</td>
</tr>
</tbody>
</table>

* Difference between sub-groups is significant at 5% level
Table VIII. Experience with ECR

Respondents were also asked if they had experienced any negative consequences of adopting ECR. A number of possible consequences were provided in this question, which included: ‘Losing key personnel’, ‘More costs involved’, ‘Employee morale problem’, ‘Diminished customer service level’, ‘Losing valuable trading partner’, and ‘Lost sales due to out-of-stock’. For both manufacturer and retailer groups, ‘Employee morale problem’ was the most frequently cited consequence, followed by ‘Lost of sales due to out-of-stock’ and ‘More costs involved’ for manufacturers. For retailers, diverse responses over other negative consequences were given. When the responses were analysed in terms of the ECR involvement level, the most frequently cited negative consequence by both groups was ‘More costs involved’. Interestingly, those who are undecided did not expect any other negative consequences of getting involved in ECR. This suggests that ECR may introduce a number of unanticipated negative consequences, when companies get involved in the program.

In terms of performance measures, respondents were asked to indicate how ECR affected each performance measure provided in the questionnaire. The survey results show some improvement in a number of performance measures. For retailers, the most salient improvement was identified for profit, warehouse fill rate, dollar sales per square foot, inventory level, customer satisfaction and market share. In addition, retailers have experienced reductions in various costs such as for raw materials, purchasing, transport, warehouse, administrative, and marketing. For manufacturers, the most noticeable improvement was identified in sales, profit, and customer satisfaction. Reductions in transport costs and finished goods inventory were also experienced by manufacturers. Consistent with the idea that the retailer is leading ECR implementation in Australia, these findings suggest that retailers have experienced more benefits from ECR than manufacturers.

The Perceived Characteristics of ECR

Respondents were asked to describe ECR in terms of its relative advantage, compatibility with their needs, trialability of ECR components, observability of ECR benefits, complexity, switching costs, and perceived risks. The responses are presented using the following scale: 1 = very low; 2 = Low; 3 = Medium; 4 = High; 5 = Very High.

Table IX summarises the means of the responses for each characteristic by company type and ECR involvement level. The Mann-Whitney test was performed to look for significant differences. Due to the small sample, most of the test results showed no significant difference between the two groups within a variable. However, some key differences can still be identified from the survey results.

The findings demonstrate that both groups agree that ECR is a rather complex program, but the risks of getting involved in the program are low. The perceived relative advantage of ECR is higher for retailers than manufacturers. Consistently, retailers can observe the benefits of ECR more clearly than manufacturers. These results reinforce that idea that retailers are leading manufacturers. Interestingly, manufacturers’ perceptions of the compatibility of ECR and the trialability of ECR components are higher than retailers and retailers perception of the switching costs for ECR is higher than manufacturers.
The results further suggest that those companies with a wait-and-see attitude perceive the relative advantage of ECR to be low and they do not see many benefits obtainable from ECR. In addition, this group also assesses the risks of getting involved in ECR as relatively higher than does the group of those who are actively involved in the program. By contrast, those companies who are actively involved in ECR agree that ECR has medium relative advantage, compatibility, trialability, observability, and switching costs, but the complexity is rather high, with relatively low risks. The perceived risk findings appear to contradict the previous finding that the undecided group failed to anticipate negative consequences of ECR.

Conclusions

This study has provided additional insights towards understanding of the slow diffusion rate of ECR, by surveying the Australian grocery industry. While the small sample size meant that many differences observed in the data were not significant at 5% level, the accumulation of evidence favours the research hypotheses. As expected, the survey results demonstrate that the major driving force for manufacturers to get involved in ECR is pressure from their retailer trading partners. Retailers, on the other hand, are interested in embracing ECR in order to improve their business performance. Consequently, this affects the implementation level of ECR components among manufacturers and retailers. Most manufacturers have implemented some ECR components as a stand-alone system and they show little interest in improving supply chain management following the holistic approach of ECR. Many manufacturers plan to adopt Activity Based Costing in order to gain a better understanding of what they can achieve from ECR, before embracing the whole idea. By contrast, retailers are more enthusiastic in improving the efficiency of the supply chain as a whole using the concept of ECR.

The attitude of various management functions of retailers and manufacturers and their trading partners towards ECR indicated in this study reinforces the idea that retailers are driving the ECR implementation in Australia. The only management function of retailers that shows unfavourable attitudes toward ECR is the marketing/merchandising function. This function is the one that has direct interaction with manufacturers, who are not necessarily interested in ECR. Between those companies who are actively involved and undecided about getting involved in ECR, lower commitment level is shown among various management functions, particularly the manufacturing and finance functions.

This study also suggests that the level of satisfaction with ECR initiatives is low among manufacturers. The explanation for this is possibly that, while most manufacturers do not perceive a need to embrace ECR, they must do so if they did not want to lose their major customers. By contrast, retailers have perceived real needs to change their way of business and, thus, have gained more benefits than manufacturers in implementing ECR. This, in turn, affects the satisfaction level between the two groups.
In relation to the future of ECR adoption in Australia, it should be recognised that ECR is an inter-organisational innovation. In order to gain the maximum potential benefits of ECR, all participants within the supply chain need to collaborate to achieve the goals of ECR. In Australia, this kind of collaboration has not been achieved, as indicated by the survey results in general, and in particular by reluctance of retailers to share information with their trading partners, despite the fact that they are the ones who encourage the trading partners to get involved in ECR in most cases. In Australia, the major reason for not being involved in ECR is found to be lack of understanding of the concept. This suggests that the grocery industry Supply Chain Committee of Australia, which was established in 1996, needs to organise some conferences or seminars on ECR, or distribute publications on ECR to educate the industry. In addition, retailers need to educate their trading partners to ensure that the trading partners are well informed about the benefits of involvement in ECR. Without good partnership, ECR will fail to achieve its ultimate objectives, and this, will in turn, result in slow diffusion rate of ECR.

In keeping with the limitations of the survey method in general, the results of this study have provided only partial insights into the nature of barriers to ECR diffusion, the perception of ECR and realisation of ECR benefits in Australia. In addition, the unit of analysis in this study, which is individual companies within the Australian grocery industry as dictated by the survey method, may limit our understanding in this respect, since ECR diffusion is concerned with the entire supply chain. Therefore, in order to overcome these limitations, in-depth case studies along the supply chain, are being conducted to compliment the findings of this study.

References


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