The Mediating Roles of Third Party Organizations in ECR Adoption

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Abstract

The adoption of Efficient Consumer Response (ECR) by the grocery industry has become increasingly important in order to stay competitive. Due to the inter-organizational nature of ECR, its adoption involves various parties with different and conflicting objectives and requires the concerted effort of supply chain members. Thus, third party organizations may be important in ECR adoption, but the exact roles they play have received little research attention. Employing a multiple case study, this study uncovers five roles third parties play and extends a previously published model of ECR adoption to include third parties as mediators in the ECR adoption process. The results are important theoretically for understanding the complexities of inter-organizational systems adoption general, and practically to promote the growth of ECR in particular.

1. Introduction

Due to increasing global competition, adoption of inter-organizational systems (IOS), particularly those enabled by Electronic Commerce (EC) technologies, is becoming important for organizations to stay competitive [20]. Many organizations within a supply chain have made a joint effort and are working to improve the efficiency of product and information flow within the entire supply chain. This will, in turn, enable organizations to be responsive to the needs of the consumers, who are becoming more demanding in terms of prices and quality of products [12, 17].

Efficient Consumer Response (ECR) is an EC-enabled grocery supply chain management vision, which is designed to make the industry more efficient and responsive. It promotes initiatives in the areas of store assortment, product development and introduction, promotion, and product replenishment. These four strategic initiatives of ECR are supported by two process innovations: Category Management and Continuous Replenishment Program. These two programs are in turn supported by a number of enabling technologies: barcode / scanners, Electronic Data Interchange, Computer-Aided Ordering, alternative distribution methods (such as cross-docking, Direct Store Delivery, Vendor-Managed Inventory), and Activity-Based Costing [16].

As an example of an IOS, ECR cannot be adopted by individual organizations in isolation from other trading partners as it requires the concerted effort of participants in the same supply chains and third parties within the industry such as standard bodies or regulators [11]. In addition, multiple decision-making units, which normally have different and conflicting interests and objectives, are involved in IOS adoption. Furthermore, ECR adoption involves significant changes to an organization’s culture, structure, business relationships and working practices over time [1, 2, 9]. It also requires an integration of activities with business partners at the operational, tactical and strategic levels [6, 20]. Therefore, despite the many potential benefits of ECR, its adoption has been slow in many regions, notably in Europe, America, and Australia.

There have been a number of studies (see for example [9, 13, 15]) conducted to explore the adoption process of ECR in various regions. However, none of the previous studies, particularly in Australia, has looked into the role of external/third parties in the adoption process. Third parties are typically not part of the supply chains in the industry and some of them have been established mainly to assist the Grocery Industry participants with different issues regarding ECR adoption. Furthermore, third parties should have no obligations or financial interests in the coordination of activities for participants. Due the inter-organizational nature of ECR, these third parties may play an important role in assisting organizations within the grocery industry to adopt ECR [13]. In Australia, in particular, previous studies [13, 14] indicate the problem of unequal distribution of costs, benefits and risks among manufacturers, distributors and retailers and a lack of cooperation and trust between manufacturers and retailers. In such a situation, third
parties may play a role in assisting organizations to achieve mutuality which will, in turn, lead to improving the level of cooperation and trust, necessary for ECR adoption.

To address the gap in the literature, this study aims to explore how third parties assist organizations within the Australian grocery industry in adopting ECR. For this purpose, a multiple case study with a number of third parties within the Australian grocery industry was conducted. The findings indicate that third parties play several important roles in assisting organizations with their ECR adoption process through advising the industry members, conducting research on behalf of the industry, educating the industry members of the benefits of ECR, promoting the potential of ECR and facilitating working groups to achieve certain goals within the industry. Based on these findings, the existing model of ECR adoption in Australia has been refined to incorporate the influence of third parties as mediators in the adoption process.

In the next section, existing models of ECR adoption are presented. Then the multiple case study research method is described and the findings are discussed comprehensively. Finally, the implications of the findings to the existing ECR adoption model is outlined and conclusions are drawn.

2. Existing Models of ECR Adoption

As an example of technological innovation, adoption of ECR can be studied using a ‘factor’ approach or ‘processual approach’ [5, 14, 18]. Early studies of ECR adoption in Australia (see for example, [9, 13]) were based on the adoption model developed by Iacovou [10] in the context of EDI adoption. These studies employed the factor approach. Such studies typically involve conducting a survey to explore various factors that may affect the adoption of ECR based on the individual organization’s experience. The unit of analysis was individual organizations within the Australian grocery industry. Based on this approach, Kurnia and Johnston [14] proposed a so-called a ‘first-order’ model of ECR, as shown in Figure 1. A number of variables in the model, which are categorized into ‘Nature of Technology’, ‘Capability of Organization’ and ‘External Factors’, were found to have a strong correlation with ECR adoption.

![Figure 1. Kurnia and Johnston’s first-order model of ECR adoption [14]](image)

The model posits that certain variables can explain the adoption of ECR by an individual company and implicitly by the Australian grocery industry. Firstly, the nature of technology or company’s perception of ECR in terms of its relative advantage, compatibility, trialability and so on, affects the decision to adopt. Likewise, a company’s perception of its own capability and readiness determines the likelihood of adoption. In addition, there are some factors beyond the control of individual companies such as pressure from trading partners, partnerships between trading partners, and...
declining competitiveness, to name a few, that drive individual companies to ECR adoption.

The model has been useful in exploring the experiences of the Australian grocery industry with ECR adoption and explaining the slow adoption rate within the industry [14]. However, other studies of IOS adoption employing case studies discovered some variations in levels of adoption, which cannot be explained by the first-order model of ECR adoption [3, 4]. Factors identified in the first-order model are necessary for adoption, but are not in themselves sufficient to account for the richness of adoption experiences. The inter-organizational nature of ECR requires concerted actions by firms in particular supply chains and perhaps across the entire industry for adoption. As a result, Kurnia and Johnston [14] proposed a ‘second-order’ model of ECR adoption, which is basically a modification of the first-order model, as shown in Figure 2. In this model, the existence and consequences of the inter-organizational context of ECR are explicitly recognized. Processual study over a period of time is required to understand the inter-organizational interactions in ECR adoption [5].

The second-order model depicts that when inter-organizational interactions are considered some factors identified as external forces in the first-order model are now seen to be part of internal industry interactions. For instance, pressure from trading partners, which is one of the external factors in the first-order model, now becomes part of the internal interactions between organizations and their trading partners, as organizations being pressured by their trading partners may negotiate trading terms to ensure the mutuality of ECR adoption. With this mutuality, cooperation between trading partners can be then obtained, leading to the establishment of partnership and trust over time. Therefore, partnerships and trust between trading partners are also no longer viewed as external factors that are beyond the control of organizations. These factors now become part of the internal industry interactions, which are very much tied in with the political, competitive, economic and corporate relations among the industry players [14].

![Figure 2. Kurnia and Johnston’s second-order model of ECR adoption [14]](image)

In addition, as the interactions of the organizations with their supply chains and the industry are considered, the nature of the causal links between actions of organizations and the nature of the technology, and between actions of organizations and their capabilities are now changed. Now, not only does the nature of technology affects organization’s action (arrow a in Figure 2), but also the attractiveness of ECR program can be enhanced (arrow b) through reciprocal interactions between the focal organization and its supply chain over time. Likewise, through these interactions, organizations can also modify their capability and their readiness in adopting ECR (arrow c). All these mutual interactions are mediated by the structure and conditions of the inter-organizational environment (arrow e), but this environment can be
changed if the organizations are powerful enough within the industry to routinize the changes (arrow f) [3, 14]. When intended or unintended consequences of adoption become routinized, a new structure of supply chains and the industry may be established which is consistent with ECR practices. Only at this stage, will the adoption of ECR be successful (arrow h).

This is a more emergent perspective on ECR adoption than the strong causal connection of the first-order model. All mutual interactions shown in the model are products of change processes that need to occur over time and space in the course of routinizing the Australian grocery industry’s own variations on work practices proposed by ECR. With this model, there are still external factors that are beyond the control of organizations and, therefore, have essentially a one-way influence on actions of organizations (arrow g).

The model, nevertheless, does not explain how organizations interact with third parties in ECR adoption process. These third parties include Standard Bodies (such as EAN Australia, Automatic Data Capture Association, TradeGate), Trade Associations (such as ECR Australasia, Australian Food and Grocery Council, Australian Retailers Association) and others (such as IBM Australia, Commerce Association, Pricewaterhouse Coopers). Built upon the existing ECR adoption model, this study assesses how these third parties assist organizations within the Australian grocery industry in ECR adoption and enriches the ECR adoption model by incorporating the third parties in the ECR adoption process.

3. The Multiple Case Study

For the purpose of this study, a multiple case study was used as it enabled us to collect rich information from various third parties of the Australian grocery industry regarding their involvement in ECR adoption. The research aim was theory building so case study is appropriate [21]. The unit of analysis used for this study was individual organizations that were considered third parties. Potential participants included trade associations, standard bodies and consultancies who also deal with the grocery industry. A list of trade associations, standard bodies and consultancies that deal with ECR was identified through an online search. Supply chain organizations were not included since they had been extensively studied in the previous study.

This study employed a combination of convenience sampling and theoretical sampling techniques [19]. The researchers began contacting various potential participants identified from the online search and started with any organizations that were willing to participate. After each interview, data were analyzed and related concepts were identified. The next participants were then chosen based on the emerging concepts identified in the previous cases, but the selection was also based on the availability and willingness of the participants. In the last two interviews, the researchers did not obtain much new information. When this theoretical saturation was achieved, the data collection was therefore terminated. In total, there were seven organizations involved in this study and nine individuals were interviewed. Details of the participants are summarized in Table 1.

The multiple case study was conducted in August and September 2004. Data were collected through semi-structured interviews with managers or individuals who are involved in ECR for the Grocery Industry and a review of relevant business documents. The first few interviews were rather unstructured to enable us to obtain as much information as possible from the participants. The subsequent interviews were then more structured since some emerging concepts had been identified from the previous ones. The interview protocol is available from the authors. Face-to-face interviews were conducted with the local participants while telephone interviews were conducted with those inter-state participants. Each interview took approximately one hour.

After each interview, using the transcribed field notes all possible concepts/themes in relation to what third parties could do in assisting ECR adoption in Australia were identified. These concepts were then compared across cases to identify the similarities and differences. Based on the cross case analyses, the concepts were further refined and then written systematically to ensure that all indicators supporting each concept identified from various cases had not been overlooked. In the end, from various concepts identified possible roles of third parties were then defined as discussed in the findings section.

4. The Participants

Seven organizations participated in this study. The organizations encompass a wide range of third parties working on ECR in Australia today. They included three Trade Associations, three Consultancies and a Standard Body. A brief description of each participant is provided below. The organization names have been substituted to preserve anonymity. However, they all had considerable expertise in ECR. Table 1 below summarizes the participating organizations, the interviewees and distinguishing attributes of the organizations.
4.1. Trade Associations

TA1 is a national body representing Australian food manufacturers. This trade association provides input into policies, develops strategies and informs members on current activities from a supplier’s point of view. The board is made up of food manufacturers in the industry. The interviewee was the Deputy Chief Executive who has extensive experience in the Grocery Industry and is well recognized in Grocery Manufacturing and Australian ECR.

TA2 was set up in 1999 to bring together manufacturers and retailers to develop ECR in Australia. TA2’s business is to promote ECR to manufacturers and retailers in New Zealand and Australia. Its board is made up of retailers and manufacturers. TA2 membership includes 98% of the retail companies, most big manufacturers and around twenty small-medium sized manufacturers. A board director was the point of contact at TA2.

TA3 delivers and maintains ECR scorecards around the world. The scorecards contain Key Performance Indicators which rank organizations’ ECR capabilities. They play an important role in monitoring the progress of ECR in Australia. A board member of TA3 was interviewed.

<table>
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<tr>
<th>Table 1. Overview of the Multiple Case Study Participants</th>
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<tr>
<td><strong>Company</strong></td>
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<td>TA1</td>
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<td>TA2</td>
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<td>TA3</td>
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<tr>
<td>C2</td>
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<td>C3</td>
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4.2. Standard Bodies

SB1 is Australia’s leading barcode standards provider. SB1 provides barcode standards, barcode testing services and ECR education. They are a non-profit organization, have been established for over 25 years and have over 14,000 members. The board of SB1 is made up of twelve representatives from different industries including four which are retailers. Several participants were interviewed including the Chief Operating Officer (COO), Executive Quality Systems Manager and the Education and Support Development Manager. Both the COO and Education Manager have extensive experience working in the Grocery Retailing Industry and the Quality Systems Manager has experience in barcode standards.

4.3. Consultancies

C1 and C3 are both subsidiaries of a multi-national organization that spans hardware, software development to business consulting. C1’s offices reside in Singapore and C3’s in Sydney. Head of Consulting in both organizations participated. C2 is also a well recognized business consulting service organization with international branches. A consultant at C2 was interviewed.

5. The Findings

The findings of the multiple case study are discussed based on possible roles that third parties can play in ECR adoption in Australia, as identified in this study. These include the roles of advisor, researcher, educator, promoter, and facilitator.

5.1. Advisor

Third parties offer advice and guidance to organizations within the Grocery Industry that are involved in ECR adoption. This advice is towards developing their ECR solutions further and guiding on problematic areas. It includes advising small manufacturers within the grocery industry to adopt the international standards in order to make the industry stay in harmony with international business practices, as revealed below:

“The industry is much more global in its position these days ...Australian retailers are importing significant amount of products and Australian
5.2. Researcher

Research within the grocery industry is important with the rapid development of new technologies and best practice initiatives in ECR. Trade Associations and third parties need to be advising a party or the industry as a whole, rather than being involved in any negotiation between trading partners that is going to work for their organization. Thus, third parties need to be able to draw a line between advising and negotiation. Companies within the industry need to build a relationship with their third parties to become a point of contact for their members and understand the benefits of ECR. Organisations within the industry can use the research findings, which cost them less than the cost of gathering information by themselves.

Furthermore, third parties conduct Market Analysis for the Australian Grocery Industry to compare it with overseas grocery markets. There was a general consensus across the research participants that the Australian Grocery Industry needs to compare it with overseas grocery markets, which is very different from the Australian market. The Australian Grocery market is a very concentrated region market. Eighty percent of the local market is dominated by two major suppliers. The Trade Associations and third parties can conduct research on behalf of the grocery industry and gain sponsorship. By conducting research on behalf of the grocery industry, third parties become a point of contact for their members and understand the benefits of ECR.

5.3. Educator

Educating organizations in the benefits of ECR was a distinguishing feature in the aid to encourage the adoption of ECR, especially with small manufacturers who struggle to understand the benefits of ECR. Some of the international standards are not applicable in Australia. The Trade Associations and third parties can educate organizations to understand their cost structures. According to Head of Consulting C1, many organizations do not understand their cost structures and therefore are often reluctant to implement ECR. Chains and, therefore, are often reluctant to implement ECR.

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organizations in this respect, SB1 have developed Proof of Concept Case Studies. These case studies are created from small and large companies who have gone through a similar process to the organization in question. Quality Systems Manager from SB1 said:

“...we are trying to build up those case studies all the time because that seems to convince people more than just walking in there and saying ‘do this’.”

5.4. Promoter
The Trade Associations, Standard Bodies and Consultants advertise their ECR services in trade magazines, newsletters and web-sites to increase the industry’s awareness of ECR. Industry recommendations and reports can be prepared by any third parties. These can be generic industry reports covering issues affecting the entire industry. Organization specific reports can be requested from Consultants by an individual company. Work is often generated through contacts, approaching customers and word-of-mouth.

In most cases, there was no formal follow up when a party was assisted in ECR. To encourage further adoption, third parties should build on their first relationship to ensure further ECR initiatives are implemented and current ECR initiatives are maintained. It was found that both Trade Associations involved in this study, TA1 and TA2 are continually involved with grocery participants. Trade Associations deal at the industry level and support the industry through producing industry reports and conducting tracking studies. However, there is no formal follow up after ECR integration assistance has been given by SB1. Thus, the findings suggest that the role of promoter played by the third parties should be further improved in order to encourage wider adoption of ECR.

5.5. Facilitator
The Trade Associations act as facilitators to ensure that progress in ECR is smooth. In some cases they also provide the physical venue for parties to come together. TA2, for example, brings together parties from the Grocery Industry to have forums on current issues. Working groups are set up to temporarily work together on an industry goal. Third parties set up and facilitate these working groups. The external independent view is important to develop a trustworthy environment for trading partners. Their independent view ensures they are reputable in ensuring fair outcomes in any scenarios.

6. A New Model of ECR Adoption: Third Parties as Mediators

While the ECR adoption model proposed by Kurnia and Johnston [14] captures the complex interactions between trading partners in the course of ECR adoption, it does not explicitly show that various interactions occurring in the industry actually involve third parties, since the role of third parties in ECR adoption was not examined in that study. From this study, it is clearly evident that the third parties play an important role and, hence, impact on the way ECR is adopted in Australia.

To capture the role of third parties in ECR adoption, Figure 3 shows the modified ECR adoption model by including the third parties as mediators of the prime causal relationships. The extension in Figure 3 shows third parties assisting organizations in ECR adoption by mediating casual links a, b, c, d, e and f and indicates the empirically identified third party roles relevant to each link.

For the causal link that represents the affect of organization’s perception of ECR on the decision to adopt (arrow a), third parties stand between the devisor of ECR (Kurt Salmon Associates) and organizations within the industry as they promote and explain the ECR vision to the industry. Thus, through their role as promoters and educators, third parties establish organization’s perception of ECR, which affects organization’s decision to adopt.

Furthermore, third parties also intermediate change to the ECR vision by organizations as they experienced and put the program into practice (arrow b). For example, third parties may conduct research on behalf of the industry to find out what is suitable for the Australian grocery industry, advise on appropriate standards, and assist organizations to collectively modify the ECR vision to suit the local condition, including market situations and supply chain structures. Likewise, third parties can educate small organizations that typically do not have a clear idea of the benefits of ECR. Through third party’s roles as advisor, researchers, facilitators, and educators, the vision of ECR can be therefore be adapted and enhanced, which will improve the attractiveness of the program.

For the causal link that represents the affect of organizations capability on the likelihood of adoption (arrow d), third parties can also help organization assess their capabilities through benchmarking and allay their fears that they cannot implement ECR with their current capabilities. This can be achieved through the roles of third parties as advisors and researchers. In addition, third parties can help improve organization’s capability and readiness to adopt ECR (arrow e), which will, in turn, increase the likelihood of adoption. For example, by educating organizations about ECR benefits, top management commitment and clear vision can be obtained. Similarly, by facilitating
working groups, third parties enable trading partners to share ideas, discuss any issues regarding ECR adoption and increase each party’s capability in adopting ECR. Thus, the relevant roles of third parties in this case are educators and facilitators.

For causal links represented by arrows e and f, figure 3 indicates that the third parties mediate the interaction between the actions of individual supply chain firms and the structure of the collective of firms. This relation between firm action and collective structure has previously been discussed using Gidden’s Structuration Theory [8, 11]. In fact, the roles played by third parties are consistent with the three modalities of interactions proposed by the theory [7, 8, 11], which are interpretive schemes, facilities and norms. In the context of ECR adoption, third parties help organizations share knowledge, facilitate/inhibit the exercise of power of large trading partners over small organizations and establish industry norms (rules) to encourage ECR adoption through their roles as advisors, researchers, educators, and facilitators. For example, for the causal link representing the affect of the structure of the supply chains (industry) on the ability of organizations to adopt ECR (arrow e), third parties can explain to small organizations of the benefits of being involved in ECR as mandated by large trading partners. Furthermore, they can help small organizations understand their cost structure. Thus, the intermediation of third parties in this causal link is achieved through their roles as advisors, researchers, educators and researchers. Likewise, through knowledge sharing and an understanding of the cost structure, organizations can renegotiate trading terms to ensure costs, benefits are equally shared by supply chain participants and, this, in turn, leads to improving relationships between trading partners in the supply chain (arrow f). With an improved supply chain (industry) condition, the likelihood of organizations to adopt ECR is also improved. Through working groups, third parties also assist organizations and the industry to establish appropriate rules necessary for ECR adoption. Thus, third parties intermediate in the last causal link (arrow f) through their roles as advisors, researchers, educators, and facilitators.

Table 2 summarizes the way third parties mediate each causal link between the focal organization, the nature of the technology, the capability of the organization and the supply chain / industry structure.

Figure 3. A Revised model of ECR adoption including third party organizations
In short, the revised model suggests that third parties intermediate the way the focal organization interacts with its trading partners within the supply chain and the industry. Through these interactions, the nature of the ECR program, the capabilities of the organizations, and the structure of the supply chain and industry can be altered over time and be aligned with the ECR adoption requirements. Thus, the comprehensiveness of the ECR adoption model proposed by Kurnia and Johnston [14] is enhanced by the inclusion of the third parties in the adoption process.

### Table 2. Summary of the influence of third parties in ECR adoption

<table>
<thead>
<tr>
<th>Causal Link</th>
<th>Mediation</th>
<th>Relevant Roles</th>
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<tbody>
<tr>
<td>Arrow a - the perception of technology determines adoption decision.</td>
<td>Third parties promote and explain ECR vision to the industry.</td>
<td>Promoter, educator.</td>
</tr>
<tr>
<td>Arrow b – through interactions with inter-organizational environment, organizations can modify the nature of ECR</td>
<td>Third parties conduct research, advise on appropriate standards and vision, facilitate collective action to modify ECR vision and educate organizations in ECR benefits.</td>
<td>Advisor, researcher, facilitator and educator.</td>
</tr>
<tr>
<td>Arrow c - organizations modify their capability through interactions with their inter-organizational environmental.</td>
<td>Third parties help organizations improve their capabilities such as in obtaining top management commitment by demonstrating the benefits and improving communication openness and selection of performance measures through working groups.</td>
<td>Educator and facilitator.</td>
</tr>
<tr>
<td>Arrow d – organization capability determines adoption decision.</td>
<td>Third parties help organizations measure and be aware of their own capabilities and readiness to adopt ECR.</td>
<td>Advisor, researcher.</td>
</tr>
<tr>
<td>Arrow e – the structure of supply chain and industry determines adoption decision.</td>
<td>Third parties explain to small organizations the benefits of being involved in ECR as mandated by large trading partners. They also help them understand how the cost structure is affected by ECR.</td>
<td>Advisor, educator, researcher.</td>
</tr>
<tr>
<td>Arrow f – new structure is produced through routinization of changes.</td>
<td>Third parties improve knowledge sharing within the industry, facilitate renegotiation of trading terms and facilitate establishment of industry norms.</td>
<td>Advisor, educator, researcher and facilitator.</td>
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### 7. Conclusions

The inter-organizational system nature of ECR has created inherent barriers to its adoption. Its adoption requires commitment from various trading partners within the supply chain, which is difficult to achieve since trading partners usually have different and conflicting objectives. In Australia, particularly, the grocery industry is dominated by two large, powerful retailers who have been interested in pursuing various ECR initiatives. However, it has been difficult for the retailers to adopt ECR since there is generally a low level of trust and cooperation between Australian retailers and manufacturers. Many manufacturers believe that ECR only benefits the retailers and, therefore, are not interested in ECR. Hence, the involvement of third parties is necessary to promote the growth of ECR.

Through a multiple case study involving various types of third parties in the Australian Grocery Industry, this research has demonstrated that third parties play an important role in assisting organizations to adopt ECR. Third parties are greatly involved in educating the Grocery Industry on the benefits of ECR as there is no common consensus in the industry on the benefits. In particular, they assist small suppliers to understand the benefits they could obtain from retailer-mandated processes and empower them with a better understanding of the cost structure in order to better negotiate trading terms with the retailers. With more recognition of ECR benefits by organizations of all sizes within the Australian grocery industry, the adoption of ECR can be further encouraged. This study has also allowed an existing model of ECR adoption in Australia by Kurnia and Johnston [14] to be made more comprehensive by explicitly showing the mediating roles of third parties in the adoption process.

There are, however, some limitations to this study. Firstly, the number of third parties involved in this study was limited. Involving other third parties might have been useful to enrich the findings. However, because theoretical saturation was reached during the multiple case study, it is believed that the findings of this study are valuable and generalizable to some extent. Secondly, organizations involved in ECR adoption could be involved in this study to verify the opinions of third parties identified. Nevertheless, the findings should be valid and reliable through triangulation obtained from the cross case analyses and because some of the participants were also manufacturers and retailers within the Australian grocery industry. Finally, further study to explore how third parties assist organizations in other regions to adopt ECR, and the effectiveness of this role, would be valuable in complementing the findings of this study.
9. References


