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Research Article

A Model Predicting CRM Resource Effect on Business Performance through CRM Capabilities

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This study employs the CRM measurement model to the context of customer relationship management (CRM). It is aimed at indirectly examining the relationships between various resources of CRM and business performance. Additionally, this study is aimed at contributing to marketing research by placing an emphasis on CRM technology and their impact on performance. Through collecting secondary data, the direct and indirect effects of CRM resources and capabilities on business performance are examined within a sample of 6 case companies in the UK grocery market during 2015~2017. Additional measure of CRM capability is aggregated into the firm level to examine its relationship with their corporate performance. Furthermore, capability is categorized through defining the intention of initiating CRM programme. The results find a positive relationship between both CRM resources and their capabilities and performance. Besides, interactive capability is most essential for companies to enhance their CRM. Lastly, the interaction between technology and other resource is significantly associated with business performance. Managers may improve their CRM programs and eliminate side effects more effectively by concentrating on one type of resource to strengthen their most common CRM capability. This paper bridges significant gaps in the current literature through combining RBV and DC perspective, meanwhile, taking a capability view of CRM. Under a contemporary CRM measurement model, it examines how the possession of important CRM resource influences business performance in UK supermarket.

1. Introduction

Customer relationship management (CRM) has been defined as a process of recognizing, engaging, segmenting, and retaining customers [1]. Since 2011, CRM has been deployed as a significant approach to enhance customer satisfaction and upgrade business performance. Over the past decade, there were a growing number of investments in CRM practices [2]. Nevertheless, the actual level of integration between CRM projects and organizational systems was far below expectation [3]. Researchers argue that with focus on the technical aspect, CRM cannot solve people and organizational issues empirically [4]. Significantly, it has been mentioned that about 60% of CRM efforts have ended up in failures [5]. And in reality, nearly 70% of practices failed to meet the baseline improvement in business performance [6]. This study will adopt CRM antecedent and consequence model in the following analysis [7]. And this model has been found that CRM capabilities are both affected by technology resources and other resources such as culture and organizational factors.

CRM will be analyzed upon supermarket industry. Since retail industry is well known for heavy investment in CRM systems [8], the effectiveness of CRM is difficult to be measured [2]. This study is aimed at further developing CRM system operating mechanism within supermarket industry base on previous studies. Artificial intelligence-based CRM systems have been developed for business-to-business relationship management. The study in [9] developed a conceptual model using a partial least square–structured equation modeling which had significant impact on B2B relationship, customer satisfaction, and performance of an organization. Also, the study highlighted the negative impact of moderator technology turbulence on automated decision-making and operational efficiency in the case of B2B satisfaction. The

study in [10] analyzed the effect of e-marketing, e-CRM, and e-loyalty on customer performance using the SMARTPLS software. The data was collected from managers belonging to non-e-commerce companies during the pandemic and digital time period. It was found that e-CRM had significant effect on the performance of the companies and no effect on business sustainability using e-loyalty.

The unique contributions of the study include the following:

(i) The relationships among the different resources of CRM and business performance is analyzed

(ii) The direct and indirect impact of CRM resources and capabilities on business performance is analyzed

(iii) The additional measurement of CRM capability is integrated into the firm level, and its relationship with the corporate performance is also analyzed

The organization of the paper is as follows: Section 2 presents the review of related studies followed by Section 3 which presents the theoretical framework on CRM metrics and includes the key concepts in the contemporary CRM models. Section 4 discusses the findings and comparisons based on CRM measurement model, and finally, the conclusion section highlights the limitations and practical implications for UK grocery retailers.

2. Related Work

2.1. Introduction. The purpose of this literature review is to explore the theoretical context that guides our understanding concerning the implementation of CRM metrics within the supermarket industry and measurements deployed as a key performance index (KPI).

2.2. Common Performance Measurement Metrics. In terms of performance reporting, current research verifies that retailers give different names for closely related indicators. This is supported by reference [11], identifying that there are some easily recognizable overlap between different measures deployed by companies. According to reference [12], common measures are installed in a number of best-known supermarkets, for example, sales growth, customer satisfaction, and return on investment.

2.3. Metrics as KPI. Figure 1 condenses the common performance measurement metrics through reviewing the literature of retail management. With a focus on key performance index (KPI), practitioners like the reference [13] propose that 49% of current companies use customer satisfaction to measure their CRM success, and above 30% corporations measure CRM performance on sales index such as sales growth or on financial standards such as return on investment (ROI). Furthermore, the published research literature suggests that business performance measurement approach should not be limited to merely one function, rather, it should focus across many departments such as sales, marketing, operation, and finance. With consent of these metrics, we can propose a unified CRM measurement conceptual metrics through the integration of those different departments of a supermarket.

2.4. Implementation of CRM

2.4.1. Types of CRM (Categories). Some scholars [14] held that CRM can be divided into three categories: operational, analytical, and collaborative. Operational CRM focuses on improving the efficiency and productivity of business processes on interaction surface, such as call center and marketing automaton [15]. Analytical CRM is defined as the process of capturing, storing, and categorizing customer data in order to gain better understanding of customer-related information. Further, it is able to increase customer satisfaction by carrying out further relevant customized solutions to problems, such as data-mining tools [16]. Moreover, collaborative CRM collects information through integration of customer interaction channels and touch-points.

2.4.2. Detailed Description of Different CRM Tool Adoption. As a result of dissatisfaction and lost profits from not meeting customer demands, companies have recognized the significance of adopting CRM, increasing CRM budgets, and removing barriers that hold them back from attaining CRM success. More than 70% corporations admit that they are "somewhat" or "significantly" boosting their budgets around this area [17]. Over the past decade, companies have upgraded existing software (33%), increased employee training (33%), changed organizational structures (31%), implemented new software (29%), increased the number of customer service staff (29%), and added new channels/expanded existing channels (18%) as shown in Figure 2. These initiatives are helping companies to build the momentum and adjust their CRM strategy in the meantime. Some firms lay emphasis on deriving value from existing platforms, usually paid back by increasing revenue. Others tend to look into deeper issues, such as a certain CRM programme. Researchers found that 56% of corporations spend their IT budgets on sales, 51% on customer service and support, and 45% on marketing functionality [13]. However, less than 20% focus on data analytic, and merely 9% of these companies will think about integration or consolidation of their CRM system. Disappointingly, few firms would consider to incorporate CRM into business strategies and establish a company-wide CRM implementation. For instance, rewarding attentive customer service staff who always responds rapidly to customer requests or investing on mobile applications and intelligence-driven tools which collect and share real-time CRM data, thus optimizing corporate price choice. Some of the popular intelligence-driven tools in CRM include HubSpot CRM, Zoho CRM, Freshsales, Mailchimp, and many others.

2.5. CRM Measurement Model

2.5.1. The Resource-Based View (RBV) and Dynamic Capability (DC) Perspective. The resource-based view states that competitive advantages are derived from valuable, rare, inimitable, and nonsubstitutable (VRIN) resources [18]. The resource-based view is a management framework that helps

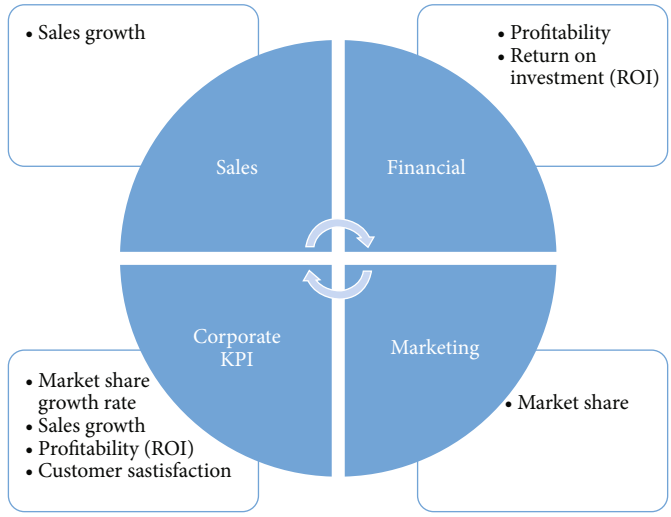

Figure 1: Performance measurement metrics.

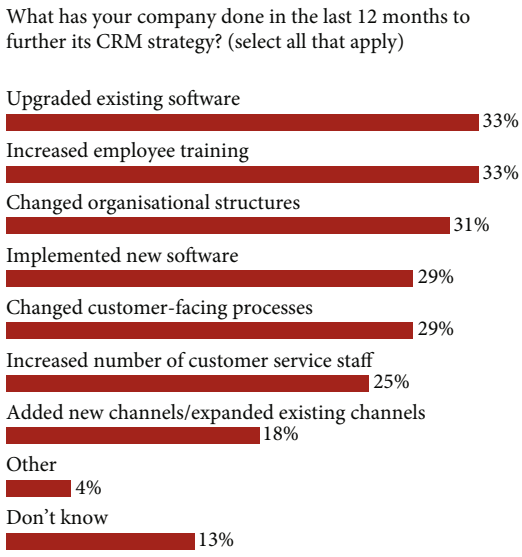

Figure 2: What has your company done to further develop CRM?

to identify strategic resources that a firm requires in order to achieve sustainable competitive advantage. There exist companies that have the exposure to external and competitive forces that are able to replicate various strategies and outperform each other. The resource-based view helps organizations achieve a competitive edge using various types of resources. Dynamic capability (DC) theory evolved as an extension to and response against the inability of resource-based view which helps to interpret the development and redevelopment of resources and its capabilities to address dynamic changing environment. However, the RBV has little focus on how those resources are managed under the background of the current dynamic business environment [19]. To compare, capability is generated from those resources, rather than resources itself, that can help a firm to sustain a competitive advantage and superior overall performance in the fast-changing environment [20, 21].

2.5.2. Difference Between Resource and Capabilities. Firm's capabilities are accumulated knowledge and skills that the firm uses to manage resources to build a core competence [21]. Organizational capabilities are embedded in organizational procedure and process which help companies to coordinate their corporate activities more effectively [22]. It has to be mentioned that firm's capabilities are largely different from VRIN resources because resources are static, but capabilities are dynamic in order to ensure that companies can always outperform their peers; thus, capabilities are the skills to deploy, manage, and leverage resources [23]. In the past, researchers have proved that marketing capabilities have a positive correlation with business performance [24]. Furthermore, reference [25] addresses that one of the most significant marketing capabilities is customer-dealing capability, which enables the company to make the best use of customer-related resources to achieve a competitive advantage. Therefore, by expanding the resource-based view (RBV) to a customer relationship management (CRM) perspective, reference [7] propose the measurement model of customer relationship management (CRM) capabilities to explore key resources and business performance consequence of CRM capabilities. This theoretical framework measures CRM capability and implies how these CRM resources, such as customer-oriented culture, customer-centric organizational system, and CRM technology, are deployed to improve business performance as illustrated in Figure 2.

2.5.3. CRM Capabilities. CRM is the organizational infrastructure that is used to identify, attract, acquire, and develop customer relationship, while improving long-term profits from valuable customers [26]. CRM capabilities are embedded within CRM activities and organizational context. Further, they represent skills and accumulated intelligence in order to maximize the value of existing customer relationships [27]. More importantly, CRM capabilities can be captured within major CRM activities [6], such as customer interaction management (e.g., customer identification,

customer acquisition, and customer retention), customer relationship upgrading (e.g., cross-selling and upselling), and customer relationship win-back (reestablishing relationships with lost but profitable customers) [6]. Accordingly, within this CRM measurement model in Figure 2, CRM capabilities are categorized into three components: (1) interactive capability; (2) customer relationship upgrading capability; and (3) customer win-back capability. Interactive capability is the skills related to customer identification, customer acquisition, and customer retention. Customer relationship upgrading capability is skills used for upselling and cross-selling to existing customers based on analytical data. Additionally, customer win-back capability refers to the skills that help firms to reconstruct the relationship with lost or inactive but profitable customers [28].

2.5.4. Customer Orientation. According to [29], successful customer relationship management needs to be customer-centric. Therefore, the first variable on X-axis is customer orientation, which reflects the culture-based concept that a company has to value their customers and put their interest in the first place [30]. As a special kind of VRIN resource, customer orientation represents a distinctive corporate value, a strategic direction, or a corporate culture. VRIN stands for valuable, rare, inimitable, and nonsubstitutable. It is a framework that was developed as an organization strategic scheme to evaluate its value proposition in any competition. These four attributes help a firm to achieve a sustained competitive edge. Nevertheless, practitioners criticize that the culture itself cannot directly impact on corporate performance. However, through emphasizing the long-term benefits from positive customer relationships, reference [25] argues that customer orientation will guide corporate mission, value, and attitude towards CRM activity completion. What is more, reference [7] discover that customer orientation has a positive association with CRM capabilities, which in return strengthen the CRM capability and enhance their bushiness performance.

2.5.5. Customer-Centric Organizational System. As the CRM capabilities are derived from the organizational processes, the effectiveness of a company's customer relationship management is highly depending on the integration of CRM practices with the firm's existing resources and structures [31]. Thus, a company needs to incorporate CRM activities into organizational operation system. Reference [32] states that it is likely to be achieved when employees are trained towards customer-facing activities or through increasing customer service staff. A customer-centric organizational system enhances the firm's ability to collect more customer data, initiates customer information sharing, and dedicates to customer-centered actions, for example, customer relationship retention and upgrading. Besides, reference [7] uncover that a customer-centric organizational system will result in stronger CRM capabilities and a higher level of business performance.

2.5.6. CRM Technology. CRM technology refers to the information technology and information system to aid better management decision-making of customer relationships [6]. It includes mobile applications installed by consumers which support marketing, sales and services, and the data collection and storage through launching and upgrading software that may integrate and analyze data about customers, as well as social media in terms of consumer complaints. According to reference [7], "CRM technology may improve an organization's ability to sustain profitable customer relationships by gathering and analyzing information about profitable customers, facilitating more efficient and effective firm- customer interactions, and streamlining product or service customization." Apart from that, they found that CRM technology has a positive association with CRM capabilities and organizational performance.

2.5.7. CRM Capabilities Result in Higher Business Performance. Since the RBV [33] and DC perspective [34], both insist that superior capabilities help firms to build core competence and thus enhance business performance. In the literature of marketing capabilities, firms with superior marketing capabilities in possession such as brand management capabilities [21] and customer-relating capabilities [32] usually have superb financial performance [24]. Researchers support that outstanding capabilities are precious and valuable not only because they assist the firm to create and deliver higher customer value which in return form a larger base of customer loyalty but also because they create competitive advantages [21]. Additionally, these CRM capabilities provide a much more accurate and timely insight for organizations to view and scan their customers' needs, in adaption with the dynamic business environment. Therefore, in a new product development or cross- selling, those firms with dynamic CRM capabilities will always be the first movers to capture higher profits by quickly adjusting to customer's needs. Reference [27] empirically tests this statement and demonstrates that business unit profits generated from successful CRM are three times higher than the average approximately. Reference [35] further support that CRM capabilities enable a firm to increase its share price. Reference [36] pinpointed additional benefits from CRM implementation, for example, the level of customer satisfaction and customer loyalty is higher. To sum up, reference [7] have proved that stronger CRM capabilities lead to improved business performance.

2.6. Barriers to Control in CRM Model. Although the CRM measurement model constructed by reference [7] has revealed that CRM resources, such as customer orientation (culture-based concept), organizational system, and technology, are positively related to business performance through much stronger CRM capabilities (interactive, upgrading, and customer win-back capability), the greatest contribution about their study is the combination of RBV and DC perspective together. However, it has to be mentioned that some limitations such as industry, firm size, and competition intensity have to be controlled.

Initially, previous studies argue that the market environment may have an influence on the strategy adoption by firms thus business performance through strategy's impact

in different countries [37]. Secondly, reference [7] employed an informant approach to collect their first-hand data. Given the exploratory nature of this study, previous literature suggests that senior managers may provide valid and reliable answers as well. Hence, the objective data collected from multiple informants could be replaced by senior managers' answers to some extent. Thirdly, the moderating effects of the contextual factors (industry and intensity of competition) are not examined. For example, financial sectors are spending more on CRM than any other industries; thus, the data given are much more reliable comparatively [38]. Eventually, given that the management of customer relationship in reality is relatively complicated, practitioners discover that large-sized firm is more likely to allocate budget on CRM and easily deploy CRM resources to reach higher CRM capabilities compared to small firms (e.g., start-ups) [39]. Additionally, the competition intensity is another control factor which needs to be discussed further.

The use of big data technologies in association with CRM could significantly improve an organization's sales performance. The study in [40, 41] developed a resource-based view (RBV) theory that was validated using partial least squares and structured equation modeling. The results highlighted the positive effect of CRM on the organization sales performance. The study in [42, 43] analyzed the relationship between E-CRM and customer experience which further impacted customer loyalty. The study revealed that the customer experience did not affect customer satisfaction or customer loyalty. However, customer satisfaction affected e-CRM on customer loyalty.

3. Methodology

3.1. Method of Reasoning. This study conducts an inductive method for reasoning. As Frankel and Devers proposed, inductive reasoning is to employ qualitative analysis through fact interpretation and idea extension. Further, in this study, our approach is to restrict independent variables from CRM measurement model and manage them into tables. Meantime, we try to critically evaluate all events collected and condense them in several nonnumerical and numerical metric in order to find further results.

3.2. Case Study Approach. This easily uses a case study method to conduct qualitative and exploratory analysis on target samples based on secondary data collections. First, within supermarket industry in the UK, these case companies need to have actively applied CRM in yearly practices. Second, case companies (Waitrose, Aldi, Sainsbury's, Asda, Tesco, and the Cooperative) were chosen in accordance with their UK customer satisfaction index (UKCSI) as illustrated in Figure 3. As for resourcing, research data about what companies have done in their CRM have been collected from authoritative channels, such as IDG Retail Analysis and the Institute of Customer Service (ICS), which is a professional research institution releasing customer satisfaction index across the UK annually. ICS publishes reports based on professional analysis of nationwide customer service and company's annuals. As a result, UKCSI collected from this institute can be considered suitable to evaluate candidates' CRM programme in terms of customer satisfaction.

All the cases and examples were gathered through secondary data collection from authoritative sources, for example, Mintel Reports and each companies' annual report. Moreover, the criteria on our study are objective. This paper is aimed at analyzing CRM objectives from annuals, chairman announcements, and corporate strategic direction. Additionally, the basic principles on event identification and data selection are also rigid to standard, where each case should include at least one sort of customer relationship management.

3.3. Sample. In accordance with UKCSI (2017/2018), Waitrose, Aldi, and Sainsbury's have been randomly selected from the outperforming cluster as the top three in customer satisfaction level. Tesco, Asda, and the Cooperative have been chosen from the least five, which ranked lower in UKSCI. It is reasonable to choose samples in this method because the objects of study are uniformly distributed in the customer satisfaction map, and companies within the sample set have already included the best performed (Waitrose) and the worst (the Cooperative). Therefore, the established sample set in this study is representative for the UK grocery industry. Furthermore, this study will gather 10 to 14 real CRM practices from each company between the year 2015 and year 2017.

3.4. Measurement. The measurement metrics of this study are based on antecedence and consequences of the CRM measurement model [7]. And this model includes 3 main variables: resources, capabilities, and business performances.

3.4.1. Resources. Resources are initial variables in this model. They are divided into 3 categories: customer orientation, customer-centric organizational system, and CRM technology. Importantly, these 3 categories will be set as 3 main columns in our table. First, as for customer orientation, it is a culture-based influence from organization towards customers. Second, this study categorizes organizational system into 3 types, which are amount of customer-facing staff training (1), optimization of organizational structure (2), and speed-up delivery (3) [7]. Thirdly, CRM technology is a certain type of information technology that is used for a better performance in customer relationship management [6]. In this study, we further divide CRM technology practices into 5 categories, which includes (1) social media, (2) new software, (3) upgrade software/Internet retailing, (4) mobile apps, and (5) loyalty card/partnership card. To be noticed, the principles for this subcategories' classification are initially following by the method used in reference [13] as illustrated in Figure 4. This research above basically divided CRM-related technologies into (1) upgrading existing software, (2) implementing new software, and (3) adding/expanding channels (including social media and mobile apps). Additionally, loyalty card/partnership card is added as a separate new technology application in subcategory. Loyalty or partnership cards are usually being

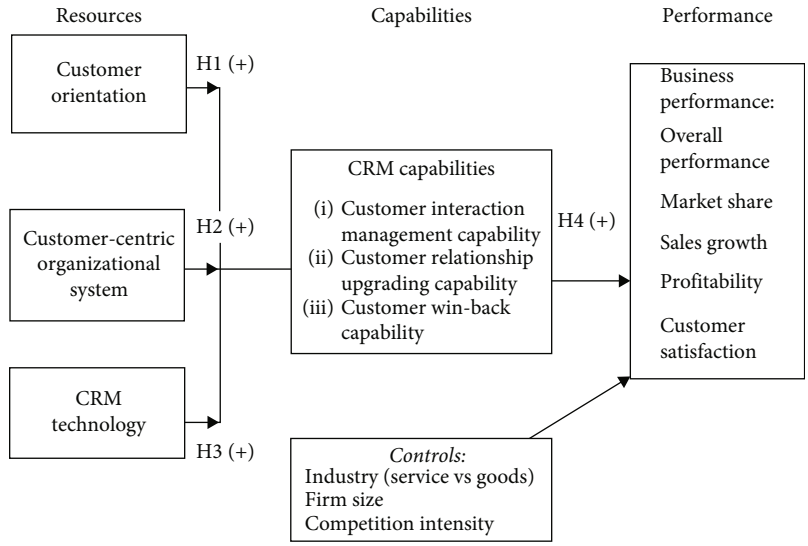

Figure 3: CRM measurement model.

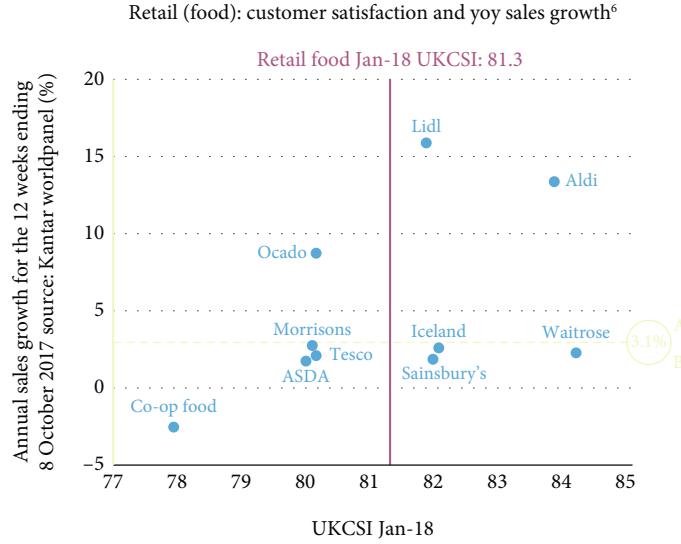

Figure 4: UKCSI.

combined to use in point collection in supermarket. Finally, these 3 kinds of resources, namely, customer orientation, customer-centric organizational system, and CRM technology, will be measured in a quantitative manner in order to counter numbers of event in CRM and to conduct qualitative analysis for discussion.

3.4.2. Capabilities. Capability is an intermediate variable which can be influenced by resources in CRM measurement model. The first element in CRM capabilities is customer interactive capability. In this study, we will categorize events into interactive capability if they are covered with abilities among customer identification, acquisition, and retention according to definition. And the second component of CRM capabilities is upgrading capability. This study will generally count supermarket CRM practices into this capability if they held promotion activities for upselling or cross-selling. And the last category of CRM capabilities is customer win-back. It is used to judge whether firms have actively engaged in reestablishing the relationships with lost or inactive but profitable customers [7].

3.4.3. Business performance. Business performance is a dependent variable for either resources or capabilities directly and indirectly. And it was measured by 4 areas: (1) market share; (2) sales growth; (3) profitability; and (4) customer satisfaction. In this study, the overall performance will be measured according to the average ranks of the other 4 metrics. Additionally, sales growth between 2015 and 2017 will be calculated in equation4. In addition, profitability will be calculated in the manner5. Furthermore, customer satisfaction score will be the same as those in UKCSI reports (2015~2017).

3.5. Tables and Table Interpretation

3.5.1. Resource-Capability Table for Each Company. The resource-capability table positioned each case company within CRM resources and capability metric. Resources are independent variables and spread out in column, whereas capabilities are the dependent variable spread out in lines as illustrated in Figure 5. Therefore, each event will be positioned at a point of intersection within the lines and columns, indicating the most prominent CRM resource and capability. This study then will then calculate the overall percentage usage of each resource and capability. The resources or capabilities with high percentages will be seen as the major drivers of companies' performance. And the sum total percentage of each resource or capabilities should be equal to one.

3.5.2. Influential Pattern between Resource and Capability. The aggregated table below tries to provide a quantitative analysis between the resource-capability relationship and their business performance. From Figure 6, each company can spot its most frequently used CRM capabilities and the most prominent resource. Therefore, we are able to list all of the six companies according to their business performance and further discuss the similarities, differences, and overall trend in adopting prominent resources or capabilities in different supermarkets. Usually, companies may adopt more than one resource towards each single capability or enhanced performance. However, one sort of resource may have a larger impact on business performance than others.

3.5.3. Capability-Business Performance Table. Table 1 identifies the relationship between 3 types of CRM capabilities and overall business performance by simplifying the effect of technology. Within the table, firm's performance rank will be measured by two variables: one is the amount of a certain type of capability and the other is percentage of technology usage in forming this capability. Therefore, 3 types of capabilities can be further examined through: (1) frequency of using one capability and accordingly business performance; then divided by (2) percentage of total technology usage in that capability and accordingly business performance above all.

4. Findings

The first finding is about the individual business performance of the six supermarkets and their overall performance. Then, CRM resources and capabilities of each company will be identified in six individual resources. Next, the figure summarizes their major CRM capability, major CRM resource, and major resource contributing to their CRM capability. The table highlights what resource is used most frequently for each company. Then, several groups of comparisons between two different supermarkets are made, to find out the positive and negative effect of their CRM resources on business performance. Finally, three charts are formed to further research the relationship among CRM technology, CRM capability, and business performance.

4.1. Overall Performance Rank List. Initially, we found that Waitrose ranked the top on the list, Aldi ranked as no. 2, Sainsbury's ranked as no. 3, Asda ranked as no. 4, Tesco ranked as no. 5, and the Cooperative ranked as no. 6. Table 2 lists the business performance measurement of each supermarket, in terms of market share growth rate, sales growth, profitability, and customer satisfaction. These results are derived from the data of each company's annual reports from 2015 to 2017. Noticeably, the profitability and the customer satisfaction column employ the average among the three year's relevant data, respectively. In terms of the market share growth rate and sales growth rate, the calculation equation is added in the footnote part. We ranked the companies in each column and then added their rank separately to get their overall performance rank.

4.2. Individual Companies' Resources and Capabilities. This section illustrates how to interpret the event list. Every event can be interpreted as "using certain resources to improve certain capabilities". Taking Waitrose as an example, the first event is named "Ecrebo's marketing platform." This event can be described as using Ecrebo's marketing platform to send targeted offers to customers, based on the products they have bought. Additionally, Ecrebo's platform is a new software with CRM technology to analyze their buying behavior in order to improve the customer retention level. Therefore, "Ecrebo's marketing platform" is ticked at the intersection of "New software" in the resource column and "Interactive capability (related to customer retention)" in the capability column. However, it is noticed that some events may improve two capabilities at the same time. For example, in the Waitrose case, using "Quick Check mobile app" can extend the channel to acquire customers' information and make customers buy more other similar products on the app. Therefore, this event appeared in both interactive capability and upgrading capability (used for cross-selling and upselling).

In order to find out how frequently a company adopts a certain resource, the table counts the number of each resource used and its proportion, then shows them in the bottom of the table as "Total." Secondly, the table counts the number of events contributing to the three capabilities and shows them on the rightmost side of the table as "Total." Thirdly, it is also aimed at finding out the proportion of one main resource out of each capability. In other words, it intends to solve the question such as "How much do customer-orientation, organizational system and technology resource make up for interactive capability respectively." Therefore, "Capability events per resource" column is added in the interval between each two capabilities. The findings are described in Table 3.

4.3. Summary. In all, there are major findings about these six supermarkets. First, interactive capability is the major capability for all these six supermarkets. Sainsbury's and Tesco's interactive capabilities occupy the largest proportion, which are 86% among three capabilities, while Asda and Waitrose only witness 54% and 64% improvement in their interactive capability. Interactive capability appeared in the tables most frequently. This is because interactive capability is closely related to customer identification, acquisition, and retention.

Waitrose											
		Customer orientation	Organizational system			Technology					
	Name of events	Culturebased concept	Increase customer lacing staffe/training	Organizational structure	Speed up delivery	Social media	New software	Upgrade software/ internet retailing	Mobile apps	Loyalty card/ partnership card	Total
Interactive capability	Ecrebo's marketing platform						√				9 (64%)
	In-store self-check-in										
	Cookery schools	√									
	Information-swapping system										
	Quick check mobile' app							√			
	Free drinks	√									
	Partnership card with John Lewis									7	
	Healthcare label. fitness lifestyle ideas	√									
	Digital shelf-edge ticketing										
Capability events per resource		3		0				6			
Upgrading capability	New customer-focused provision	√									4 (29%)
	Quick check mobile app										
	Earn points from John Lewis									7	
	Additional customer searching areas	√									
Capability events per resource		2		0				2			
Win-back capability	Complaint handling on facebook										1 (7%)
Capability events per resource		0		0				1			
Total		5 (36%)		0 (0%)				9 (64%)			14 (100%)

Figure 5: Example of resource-capability table for Waitrose.

		Company					
		Waitrose	Aldi	Sainsbury's	Asda	Tesco	The Cooperative
Major capability		64% Interac.	70% Interac.	86% Interac.	54% Interac.	86% Interac.	85% Interac.
Proportion of each resource		64% Tec. 36% Orien.	60% Orien. 30% Tec. 10% Sys.	50% Tec. 29% Sys. 21% Orien.	54% Orien. 31% Sys. 15% Tec.	57% Tec. 29% Sys. 14% Orien.	42% Orien. 37% Tec. 21% Sys.
Most frequently used resource		Tec.	Orien.	Tec.	Orien.	Tec.	Orien.
Major resource to capability	Interactive	67% Tec.	57% Orien. 29% Tcc.	42% Tec. 33% Sys.	57% Sys. 14% Tec.	58% Tec. 33% Sys.	50% Orien. 33% Tec.
	Upgrading	50% Tec. 50% Orien.	50% Orien. 29% Tec.	100% Tec.	100% Orien.	100% Orien.	100% Sys.
	Win-back	100% Tec.	100% Tec.	100% Tec.	50% Orien. 50% Tec.	100% Tec.	100% Tec.
Major influential pattern between resource and capability		Tec.	Orien.	Tec. Sys.	Orien. Sys.	Tec. Sys.	Orien. Tec. Sys.

Figure 6: Influential pattern between resource and capability.

Therefore, interactive capability is the main focus on CRM capability. Besides, the most outstanding function of social media is complaint handling; hence, the company is far more likely to prove its customer win-back capability on their social media official accounts.

Second, CRM technology and customer-orientation are the two most frequently used resource for the six supermarkets. Waitrose, Sainsbury's, and Tesco prefer CRM technology the most. Aldi, Asda, and the Cooperative deploy customer-orientation resource to a large extent. However, there seems no actual correlation between those resource and their business performance rank. In other words, the business performance rank cannot be determined by whether the company uses which of the two resources most

Table 1: Capability-business performance table.

Capabilities (%)/percentage of using technology in forming capabilities (%)		Capabilities		
		Interactive capability	Upgrading capability	Win-back capability
Business performance	(1) Waitrose	64%/67%	29%/50%	7%/0%
	(2) Aldi	70%/29%	20%/50%	10%/0%
	(3) Sainsbury's	86%/42%	7%/100%	7%/100%
	(4) Asda	54%/14%	31%/0%	15%/50%
	(5) Tesco	86%/42%	7%/0%	7%/100%
	(6) The Cooperative	86%/33%	7%/0%	7%/100%

Table 2: Overall performance rank.

		Business performance (from 2015 to 2017 in the UK)				
		Market share growth rate	Sales growth	Profitability (ROI) (aver.)	Customer satisfaction (UKSQ) (aver.)	Overall performance
Company	Waitrose	0%	6.22%	7.63%	84.37	1
	Aldi	25.00%	46.11%	3%	83.13	2
	Sainsbury's	-3.07%	2.60%	3.91%	80.8	3
	Asda	-7.80%	-6.80%	4.24%	80.3	4
		-1.70%	0.50%	0.95%	78.6	5
	The Cooperative	-1.50%	2.40%	0.05%	77	6

frequently. For Waitrose and Aldi, we also reveal the similar pattern between their resource and capability. Surprisingly, both of them have single-resource-driven capabilities, while Sainsbury's, Asda's, and Tesco's capabilities are driven by two resources simultaneously. To be more specific, Sainsbury's and Tesco's capabilities are driven by both technology and organizational system; Asda is customer-oriented and organizational system oriented. Particularly, the Cooperative did not adopt concentrated resource, and therefore, there is no driven resource for its CRM capabilities.

5. Discussion and Comparison

This discussion section will first rank the case companies base on their overall performance. Accordingly, Waitrose (as no. 1) tops the list, Aldi ranks the second (no. 2), no. 3 represents Sainsbury's, no. 4 is Asda, Tesco ranks fifth (no. 5), and no. 6 is the Cooperative.

5.1. Comparison among Sainsbury's, Asda, and Tesco. Different effects of using technology and customer-orientation on business performance will be unraveled in this section through comparing no. 3 Sainsbury's, no. 4 Asda, and no. 5 Tesco. CRM is jointly affected by customer-orientation, customer-centric organizational system, and technology. Therefore, when discussing differences between customer-orientation and technology's frequency of use, the third variable-organizational system should be kept constant. As it is shown in resource-capability tables (Table 4 (Sainsbury's), Table 5 (Asda), and Table 6 (Tesco)), the frequency of deploying organizational systems resource in capabilities is 29%, 29%, and 31% for Sainsbury's, Asda, and Tesco, respectively. Therefore, it is reasonable to compare differences between customer-orientation and technology regardless of their usage of organizational systems. And the following part will make a pair comparison between these three groups: (1) Sainsbury's and Asda, (2) Asda and Tesco, and (3) Sainsbury's and Tesco.

As it is shown in Sainsbury's and Tesco's resource-capability tables, the increasing frequency of customer orientation deployment has helped Sainsbury's performed relatively better. Meanwhile, between Asda and Tesco, Asda with higher customer-orientation resource also performed better. Additionally, through comparison between Sainsbury's and Asda, it indicates that technology using frequency may also raise supermarkets' overall performance. It can be explained by technology, as the most prevalent resource in Sainsbury's, that it has been smartly deployed in the mostly adopted interactive capabilities. However, as the most popular resource in Asda, customer orientation was used less effectively to improve upgrading and win-back capabilities. This opposite consequence on Sainsbury's and Asda's performance was due to different CRM resource deployment.

Therefore, in general, increasing using the frequency of customer orientation may work more effectively than that of technologies. This finding can be supported by reference [2], who have proposed that companies with B2C schemes should concentrate more on customer orientation. Furthermore, reference [44] added that there will be extra benefits for companies with this customer orientation. Moreover, reference [45] claimed that when management practices (including CRM practices) are adopted, social pressures will mitigate the effectiveness of technical side on business performance. In conclusion, customer orientation resource has

Table 3: Waitrose's resource-capability.

		Waitrose								
		Customer orientation	Organizational system			Technology				
	Name of events	Culture-based concept	Increase customer-facing staff/training	Organizational structure	Speed-up delivery	Social media	New software	Upgrade software/ internet retailing	Mobile apps	Loyalty card/ partnership card	Total
Interactive capability	Ecrebo's marketing platform						√				9 (64%)
	In-store self-check-in										
	Cookery schools	√									
	Information-swapping system										
	Quick check Mobile' app							√			
	Free drinks	√									
	Partnership card with John Lewis									*7*	
	Healthcare label fitness lifestyle ideas	√									
	Digital shelf-edge ticketing										
Capability events per resource		*3*	0					6			
Upgrading capability	New customer-focused provision	√									4 (29%)
	Quick check mobile app										
	Earn points from John Lewis									*7*	
	Additional customer searching areas	√									
Capability events per resource		2	0					2			
Win-back capability	Complaint handling on Facebook										1 (7%)

Table 3: Continued.

	Waitrose									
		Customer orientation	Organizational system			Technology				
	Name of events	Culture-based concept	Increase customer-facing staff/training	Organizational structure	Speed-up delivery	Social media	New software	Upgrade software/ internet retailing	Mobile apps	Loyalty card/ partnership card	Total
Capability events per resource		0	0					1			
Total		5 (36%)	0(0%)					9 (64%)			14 (100%)

Table 4: Sainsbury's resource-capability.

		Sainsbury's									
		Customer orientation	Organizational system			Technology					
	Name of event	Culture-based concept	Increase customer-facing staff raining	Organizational structure	Speed-up delivery	Social media	New software	Upgrade software/ internet retailing	Mobile apps	Loyalty card/ partnership card	Total
Interactive capability	Customer-driven strategy	√									12 (86%)
	Doubling employee number		√								
	Internet retailing							√			
	Same day delivery				√						
	Automated packing system						√				
	Nectar loyalty card									√	
	Media advertising					√					
	High-quality private label	√									
	Reorganized store format			√							
	Partnership operation			√							
	Training courses	√									
	Large-scale customer feedback						√				
Capability events per resource		3		4				5			
Upgrading capability	Personalized mailings									√	1 (7%)
Capability events per resource		0		0				1			
Win-back capability	Cobranding							√			1 (7%)
Capability events per resource		0		0				1			

Table 4: Continued.

	Sainsbury's										
		Customer orientation	Organizational system			Technology					Total
	Name of event	Culture-based concept	Increase customer-facing staff raining	Organizational structure	Speed-up delivery	Social media	New software	Upgrade software/ internet retailing	Mobile apps	Loyalty card/ partnership card	
Total		3 (21%)	4 (29%)					7 (50%)			14 (100%)

Table 5: Asda's resource-capability.

		Asda									
		Customer orientation	Organizational system			Technology					
	Name of event	Culture-based concept	Increase customer-facing staff training	Organizational structure	End-up delivery	Social media	New software	Upgrade software//Internet retailing	Mobile apps	Loyalty card/ partnership card	Total
Interactive capability	Demographic tailoring stores				√						7 (54%)
	Integrated with Walmart WMX platform						√				
	Shopper-preference data analysis	√									
	Shrink-wrapped upgrading	√									
	Defer closure and ahead of opening time		√								
	Facilitate click-and-collect service				√						
	Asda's food trading organization			√							
Capability events per resource		*2*		4				1			
Upgrading capability	In-store self-service area	√									4 (31%)
	"Under one roof" campaign	√									
	New butchery service in stores	√									
	"Wonky veg boxes""misshapen vegetable"	√									
Capability events per resource		4		0				0			
Win-back capability	"That's better" campaign	√									2 (15%)
	Chef inspirational TV interaction						√				
Capability events per resource		1		0				1			

Table 5: Continued.

		Asda								
		Customer orientation	Organizational system			Technology				
	Name of event	Culture-based concept	Increase customer-facing staff training	Organizational structure	End-up delivery	Social media	New software	Upgrade software//Internet retailing	Mobile apps	Loyalty card/ partnership card	Total
Total		7 (54%)	4 (31%)					2 (15%)			13 (100%)

Table 6: Tesco's resource-capability.

		Tesco									
		Customer orientation	Organizational system				Technology				
	Name of event	Culture-based concept	Increase customer-facing staffs/training	Organizational structure	End-up delivery	Social media	New software	Upgrade software/ Internet retailing	Mobile apps	Loyalty card/ partnership card	Total
Interactive capability	Online grocery website								√		12 (S6%)
	Same-day delivery				• V						
	Facebook, Twitter, Pinterest, Google+					√					
	One-hour delivery										
	Soft-scanner service						√				
	Doubled club card points									√	
	Added 3.000 customer-facing staff		√								
	Free fruit for kids'healthy lifestyle	√									
	Consolidated customer center			√							
	Partnership on digital loyalty card									√	
	Cooperation on digital loyalty card										
	Pay quick service						√				
Capability events per resource		1		1				7			
Upgrading capability	Exclusive fresh food brands	√									1 (7%)
Capability events per resource		1		0				0			
Win-back capability	Complain handling on Facebook										1 (7%)
Capability events per resource		0		0				1			
Total		2 (14%)		4 (29%)				8 (57%)			14 (100%!

a greater impact on overall performance. Although technology resource is also important in forming company's CRM capabilities, it is less effective than cultural-based customer orientation in improving overall performance.

5.2. Comparison Between No. 2 Aldi and No. 4 Asda. To explore the relationship between the customer-centric organizational system and CRM technology, it is necessary to keep the customer-orientation usage frequency stable. Illustrated by resource-capability table, both Aldi and Asda have implemented a similar amount of customer-orientation resource, which accounts for nearly 50% separately. Therefore, it is reasonable to compare Aldi and Asda regardless of customer orientation. Resource-capability tables (Tables 3–8) demonstrate that nearly all supermarkets with high performance rank have relatively small proportion use of organizational system. In addition, even with lower frequency of organizational system's usage, Aldi performed better than Asda. Reference [2] supports that organizational system can directly affect the outcome of CRM practices. Therefore, the organizational system may not work as efficiently as the other two types of resource. To solve this problem, reference [46] proposed that, reengineering organizational system and adopting corresponding software should be a solution in CRM implementation. Therefore, it can be implied that organizational resource should be adopted in consistent with CRM technology. In conclusion, the increasing usage of organizational systems may have a negative side effect on supermarkets' business performance.

5.3. Analysis of the Cooperative Compared with Other Companies. This section analyzes whether heterogeneous resource adoption is more effective than the homogeneous. As discovered in resource-capability influential pattern table (Table 9), the Cooperative had the most heterogeneous use in resource, spending more evenly on customer-centric system (21%), CRM technology (37%), and customer orientation (42%). However, Tesco, Asda, and Sainsbury's tend to concentrate on main resources. For instance, Tesco and Sainsbury's consume more on technology and organizational system, whereas Asda prefers customer orientation and organizational system. Further, Waitrose and Aldi have a much more concentrated manner on deploying CRM resources, while Aldi is focusing on customer orientation to a large scale (60%), and Waitrose is using technology the most (64%). In summary, there is an evolving pattern drawing from those best-performing supermarkets. In conclusion, homogeneous resource is more effective than the heterogeneous. Thus, companies should focus more on a specific resource rather than diversification.

5.4. The Effect of Using CRM Technology Resources on Interactive and Upgrading Capabilities. In Figure 7, it can be seen that interactive capability and upgrading capability are the two strongest CRM capabilities among UK supermarkets. Since technology resource has a huge overall impact on business performance and CRM capabilities. It is reasonable to have a further discussion about how CRM technology influences those two strong capabilities.

Through the combination of business performance (Table 2) and resource-capability (Tables 3–8), the third main table was drawn to investigate the relationship between CRM capability and business performance. As it is shown in the table below (Table 10), three variables include overall performance rank, amount of interactive capability, and percentage of technology used to strengthen their interactive capability. To be noticed, technology is an independent variable, whereas the capabilities are an intermediate variable, and business performance is the dependent variable. Through these chart analysis, findings are drawn; CRM technology positively influences the interactive capability; nevertheless, it does not have a direct influence on business performance.

Figure 7 shows relationships among the three variables listed above (business performance, interactive capability, and technology use), with interactive capability as a mediator. First, Waitrose, as the best performer, consumes the largest percentage of using technology in forming its interactive capability (67%), whereas Asda employs the lowest level of usage (14%) which also has the worst interactive capability. Additionally, regarding with corporate interactive capability, approximately all the companies possess this as the major capability. Furthermore, it can be seen that interactive CRM capability always flows with the technology use. Therefore, there is a correlation between technology and interactive capability. However, there is no correlation between technology or interactive capability and their business performance. Generally, the degree of using technology can indicate the level of corporate interactive capability. However, it has to be added that either the independent variable—CRM technology—or interactive capability cannot predict their overall performance, which may be impacted by other environmental factors. Thirdly, when it comes to the upgrading capability, it is negatively related with CRM technology. But when technology is not deployed, upgrading capability will be positively associated with business performances (Table 11 and Figure 8).

Figure 8 illustrates the relationship among three variables when upgrading CRM capability that serves as the mediator. First, it can be seen that Asda and Waitrose have the highest level of upgrading capability, with 31% and 29%, respectively, whereas Sainsbury's, Tesco, and the Cooperative have the lower level of upgrading capabilities. Second, in terms of technology utility, Waitrose, Aldi, and Sainsbury's rank as the first three. On the contrary, either Asda, Tesco, or the Cooperative seldom use it in CRM practices. Surprisingly, when retailers add technology into their CRM project, their upgrading capability level decreases as the use of technology increases, whereas when there is no technology used in upgrading capability, retailers' business performance will decline with upgrading capability. Thus, it can be concluded that companies with less upgrading capabilities generally have a lower level in their business performance. Furthermore, increasing the usage of technology in order to promote upgrading capability may have negative effects. This phenomenon can be owed to insufficient delivery of additional products or service and lack of cross-selling and upselling information [7]. And this may also due to

Table 7: Aldi's resource-capability.

		Aldi									
		Customer orientation	Organizational system			Technology					
	Name of event	Culture-based concept	Increase customer-facing staff/training	Organizational structure	Speed-up delivery	Social media	New software	Upgrade software/ Internet retailing	Mobile apps	Loyalty card/ partnership card	Total
Interactive capability	Parenting events										7 (70%}
	Upgrading existing stores	√		√							
	GB Olympic sponsorship					√					
	Dining events										
	Create one-stop destination	√									
	Facebook and Twitter campaign					√					
	British-sourced materials										
Capability events per resource		4		1				2			
Upgrading capabilities	E-commerce store							√			2 (20%)
	Special buy lessons for customers	√									
Capability events per resource		1		0				1			
Win-back capability		√									1 (10%)
Capability events per resource		1		0				0			
Total		6 (60%)		1 (10%)				3 (30%)			10 (100%)

Table 8: Cooperative's resource-capability.

		The Cooperative									
		Customer orientation	Organizational system			Technology					
	Name of events	Culture-based concept	Increase customer-facing staffs/training	Organizational structure	End up delivery	Social media	New software	Upgrade software/ Internet retailing	Mobile apps	Loyalty card/ partnership card	Total
Interactive capability	Progression on digital space					√					12(85%)
	Mobile apps								√		
	New member benefits									√	
	Cooperation with J DA software							√			
	Private fable line for locate	√									
	Add 50 jobs in new stores										
	Create 28 jobs in a new store										
	Enhance the shopping experience	√									
	Enhanced healthy food range	√									
	Invest to support local community	√									
	Extended home-grown fruits	√									
	Trial compostable tea bags	√									
Capability events per resource		6		2				4			
Upgrading capability	Transform the store			√							1 (7%)
Capability events per resource		0		1				0			
Win-back capability	Complaint handling on Facebook					√					1 (7%)

Table 8: Continued.

		The Cooperative								
		Customer orientation	Organizational system			Technology				
	Name of events	Culture-based concept	Increase customer-facing staffs/training	Organizational structure	End up delivery	Social media	New software	Upgrade software/ Internet retailing	Mobile apps	Loyalty card/ partnership card	Total
Capability events per resource		0	0					1			
Total		6 (42%)	3 (21%)					5 (37%)			14 (100%)

Table 9: Resource-capability influential pattern table.

		Company					
		Waitrose	Aldi	Sainsbury's	Asda	Tesco	The Cooperative
Major capability		64% Interac.	70% Interac.	86% lnterac.	54% lnterac.	86% lnterac.	85% lnterac.
Proportion of each resource		64% Tec. 36% Orien.	60% Orien. 30% Tec. 10% Sys.	50% Tec. 29% Sys. 21% Orien.	54% Orien. 3l% Sys. 15% Tec.	57% Tec. 29% Sys. l4% Orien.	42% Orien. 37% Tec. 2l% Sys.
Most frequently used resource		Tec.	Orien.	Tec.	Orien.	Tec.	Orien.
Major resource to capability	Interactive	67% Tec.	57% Orien. 29% Tec.	42% Tec. 33% Sys.	57% Sys. 14% Tec.	58% Tec. 33% Sys.	50% Orien. 33% Tec.
	Upgrading	50% Tec. 50% Orien.	50% Orien. 50% Tec.	100% Tec.	100% Orien.	100% Orien.	100% Sys.
	Win-back	100% Tec.	100% Tec.	100% Tec.	50% Orien. 50% Tec.	100% Tec.	100% Tec.
Major influential pattern between resource and capability		Tec.	Orien.	Tec. Sys.	Orien.Sys.	Tec. Sys.	Orien. Tec. Sys.

Resource (independent variables): Orien.: customer orientation; Tec.: technology; Sys.: customer-centric CRM system. Capability (dependent variables): Interac.: interactive capability.

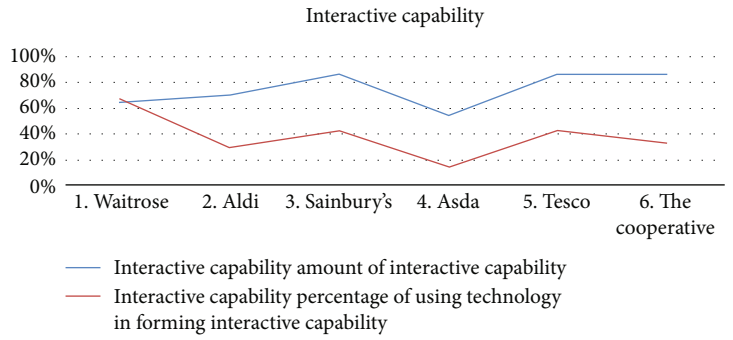

Figure 7: Interactive capability-business performance graph.

Table 10: Interactive capability-business performance table.

	Interactive capability	
Business performance rank	Amount of interactive capability	Percentage of technology in performing interactive capability
1. Waitrose	64%	67%
2. Aldi	70%	29%
3. The Sainsbury's	86%	42%
4. Asda	54%	14%
5. Tesco	86%	42%
6. The Cooperative	86%	33%

Table 11: Upgrading capability-business performance table.

	Upgrading capability	
Business performance rank	Amount of upgrading capability	Percentage of using technology in performing upgrading capability
1. Waitrose	29%	50%
2. Aldi	20%	50%
3. Sainsbury's	7%	100%
4. Asda	31%	0%
5. Tesco	7%	0%
6. The Cooperative	7%	0%

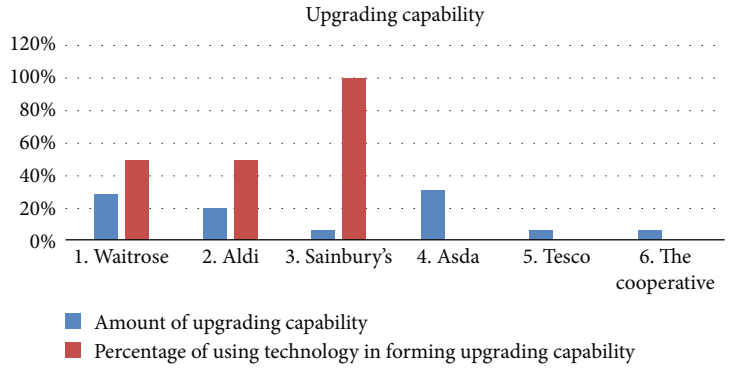

Figure 8: Upgrading capability-business performance graph.

customers' resistance in buying additional expensive products through online channel or technology.

Although a great number of research claim that CRM practices are beneficial to business [47]. Other studies have also found CRM efforts may have negative or insignificant impacts on business performance [48]. Our study stands neutrally to evaluate both sides of opinions. Firstly, there are no direct correlations between interactive capability and business performance. However, there is a positive relationship between upgrading capability and business performance. Therefore, it can be assumed that CRM investments should focus more on the upgrading capability which may lead to business operation enhancement. Therefore, referring to Discussion 1, technology's negative impact on upgrading capability may be offset by its positive effects on interactive capability. Therefore, there are no uniform effects from technology towards organizational performance through capabilities.

To summarize, although technology resource has an overall positive impact on certain CRM capabilities and business performance, nevertheless, it may have different influence on each type of capabilities. For example, a positive coefficient is found between technology and interactive capabilities. However, there is a side effect derived from technology implementation to upgrading capability. Therefore, technology may not have a direct correlation with overall capability levels or indirect correlation with overall business performance.

In conclusion, apart from the summaries drawn above (Discussion 1 ~ 4), it should also be noticed that the market environment may have an influence on the strategy adopted by firms and have an indirect influence on overall performance [37]. Additionally, we have put selected companies in the same UK industry (supermarket) and controlled comparison intensity within a relative range. However, reference [7] address that firm size may still affect each companies' performance as an uncontrollable factor in our discussions.

The study could also include change management factors in CRM and the impact of machine learning on the same. Also the results of ML lag in interpretability and transparency. The use of explainable AI could enhance transparency on the predictions and achieve more insight on analyzing the effect of CRM on performance.

Data Availability

The datasets used during the current study are available from the corresponding author on reasonable request.

Conflicts of Interest

The author declares that he has no conflict of interest.

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