

Aligning 4C Strategy with Social Network Applications for CRM Performance

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ABSTRACT

This article describes how in recent years, enterprises have increasingly adopted social technologies to support customer relationship management (CRM) practices. To increase CRM performance, enterprises have had to develop appropriate social CRM strategies in emerging social network applications. This article investigates the alignment between social network applications and the “4C strategy” as a social CRM strategy in organizations. It intends to understand how alignment influences CRM performance. A total of 225 Taiwanese companies, which have adopted Facebook to interact with customers, were surveyed. According to the results, alignment between the 4C strategy and social network applications has a positive and significant impact on CRM performance. The results also suggest that organizations require a high-level integration of social network applications with the 4C strategy to achieve high CRM performance.

KEYWORDS

4C Strategy, Alignment, CRM Performance, Customer Relationship Management (CRM), Facebook, Social CRM, Social Network Applications

INTRODUCTION

The Internet has changed the whole picture of the bonding relationship between information technology (IT) and CRM. Customers are increasingly engaged in business value chain activities by using, sharing, creating, and recreating information through social networks and applications. They demand personalized responses and instant services through a variety of social media channels and irrespective of conventional operating schedules (Pan & Lee, 2003). Facing such demands and challenges, organizations have to increasingly rely on social networks, including Facebook and Twitter, to facilitate customer engagement and promote products/services. As Web 2.0 technology continues to affect organizational technology infrastructure and architecture, two critical issues arise: (1) How can emerging social technology improve the relationship between upstream/downstream organizations and end customers? And (2) how can organizations create an alignment between emerging social technology and CRM strategy (Andriole, 2010)?

Through the integration of Web 2.0 technology, many businesses have gradually evolved to Enterprise 2.0 which refers to enterprises that use social technology platforms to facilitate internal and external communication and relationship building (McAfee, 2009). Another key feature of Enterprise 2.0 is a strong level of internal and external collaboration (Bughin, Chui, & Miller, 2009).

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To achieve this collaboration, organizations deploy Web 2.0 in three dimensions of alignment: (1) within-organization alignment; (2) organization and customer relationship alignment; and (3) organization and external suppliers or partners relationship alignment (Bughin et al., 2009). In other words, to success, businesses need to not only integrate the workflow with Web 2.0 technology but also establish an enterprise network by using the technology for the alignment with upstream suppliers and downstream customers.

Recently, many organizations extended their CRM systems to include social technologies. Research has found that 77% of companies have invested in at least one social network technology to improve internal and external communication efficiency and reduce communication cost (Bughin, 2007). Ninety-two percent have used Wikis or blogs for business purposes (McAfee, 2009). However, Gartner (2013) predicted that 80% of the social efforts would fail to some extent, as organizations continue to explore social network adoption both internally and externally. Past research found that broken linkages between organizations' CRM strategies and IT contributed to 60% to 80% of CRM project failures (Sen & Sinha, 2011). Therefore, simply adding social software to organizations' CRM systems without appropriate CRM strategies cannot guarantee customer value creation and communication efficiency. While CRM activities are increasingly popular on social network platforms supported by Web 2.0 technology, users undergo a substantial transformation from passive viewer (who passively accepts messages) to active creator of online content. The coordination and cooperation through social platforms can create greater customer value and customer relationships. Yet, such changes require companies to adopt an appropriate business strategy to reengineer their current operating processes (De Hertogh, Viaene, & Dedene, 2011).

Prior research has investigated CRM performance from various perspectives, including the information management process perspective (Payne & Frow, 2005), the resource- and capability-based perspective (Chen & Ching, 2004), and the service-profit chain perspective (Heskett, Thomas, Gary, Earl, & Leonard, 1994). Little research has explored CRM performance from the IT-business alignment perspective with some exceptions. For example, Sen and Sinha (2011) explored IT-business alignment for traditional CRM systems. Moreover, data from business practices discussed above pointed out that CRM practice changes as IT advances to Web 2.0. Thus, we argue that further research is needed to understand how the alignment between CRM business strategy and social network technology contributes to current CRM project success or failure.

Alignment between IT and business strategy has been an important research topic for researchers and a top concern for business executives for more than two decades (Baker, Jones, Cao, & Song, 2011; Sen & Sinha, 2011). The ongoing interest in this topic is partially due to the understanding that IT-business alignment is different and challenging under various IT-business contexts and environments. Moreover, the concept of alignment is complex and difficult to understand. Consequently, extant research has studied various aspects of IT-business alignment, such as measurement of alignment (e.g., Venkatraman, 1989), dynamic alignment (e.g., Baker et al., 2011), single- and multi-dimensional alignment (Chan, Huff, Barclay, & Copeland, 1997; Chong, Ooi, Chan, & Darmawan, 2011), and antecedents of alignment (Preston & Karahanna, 2009). However, little research has examined alignment in the context of social networks.

The 4C (customer demand, customer cost, convenience, and communication) strategy proposed by Kotler et al. (1999) is one of the most advocated CRM strategies based on customer orientation. Scholars believe that the 4C strategy could support various e-business models and enable Internet relational marketing (Krueger, Lu, & Swatman, 2003). While CRM strategies involve various aspects of an organization (i.e., people, management, and IT infrastructure), emerging social technology is customer-oriented. Thus, to align with emerging social technology, organizations need a strategy to emphasize customer insight, customer engagement, and a customer-centric environment.

Given its customer orientation, the 4C strategy has been adopted as a strategic framework for organizations to implement social CRM. However, little research has explored the alignment between the 4C strategy as a social CRM strategy and social technology, while how to use social technology to

support CRM strategy may be the key to improving social CRM performance. To fill gaps discussed in this section, this study strives to answer the following research questions: Can social network technology and the 4C strategy work together to increase CRM performance? What are ideal patterns of alignment between social network technology and the 4C strategy for higher CRM performance?

LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

CRM Performance

Prior research investigated CRM performance from various perspectives. From the process perspective, Payne and Frow (2005) pointed out that the evaluation of CRM performance is a process of studying the discrepancy between CRM goals and pre-established evaluation criteria serving as the basis for performance improvement. The resource- and capability-based perspective of CRM performance argues that high CRM performance relies on building CRM capabilities with rich organizational resources (Chen & Ching, 2004). CRM performance could be achieved by deploying various technologies (i.e., telephone service, Internet service, and social media service), which facilitate the adoption use of automatic service and data integration within and outside the organization (Sen & Sinha, 2011).

While the concept of customer-orientated CRM prevails, studies (e.g., Cannon & Homburg, 2001) suggest that integrating and sharing customer information, as well as increasing customer touch points, are critical in enhancing the efficiency of customer-orientated CRM. Stefanou, Sarmaniotis, and Stafyla (2003) also suggested that successful CRM activities must enable organizations to continually satisfy customer demands, desires, and satisfaction. Moreover, successful CRM must utilize more channels, especially Internet-based channels, for easy internal and external communication (Jayachandran, Sharma, Kaufman, & Pushkala, 2005). From the customer's point of view, CRM performance should be measured by customer satisfaction and retention (Jayachandran et al., 2005). This study, therefore, chooses customer satisfaction and customer retention to investigate CRM performance because social CRM is customer-oriented and Internet-based.

Social CRM

CRM is an organization-level approach to identify, recruit, and retain customers, as well to develop and maintain customer relationships. By integrating channels, products, infrastructure, and customers, CRM improves customer acquisition, retention, and value creation (Sen & Sinha, 2011). When CRM activities are transmitted or applied through network-based media, it is known as *eCRM*. *eCRM* integrates organization processes and strategies using information and network communication technology. It promises a unified, 360-degree view of customers with improved customer value, service, and satisfaction (Sen & Sinha, 2011; Sigala, 2011).

With advances in the Internet, *eCRM* has evolved to use social network platforms. It is then called social CRM. Social network platforms are supported by Web 2.0 technology which is defined as “the philosophy of mutually maximizing collective intelligence and added values for each participant by formalized and dynamic information sharing and creation” (Hoegg, Martignoni, Meckel, & Stanoevska, 2006, p. 12). Two advantages of integrating Web 2.0 technology into CRM processes are: (1) leveraging social wisdom/knowledge contributed by customers to provide a collaborative customer experience and (2) creating a relationship network with instant interaction, high customization, and high personalization (Enrico, 2007).

Past research indicated that Web 2.0 technology supports various social network applications with different social dimensions, including collective intelligence, communication, customization, and collaboration (Hoegg et al., 2006). In addition, there is a wide range of social network applications that organizations have adopted to support social CRM. However, when adopting different social network applications, organizations must focus on fundamental business goals provided by these

applications. These include obtaining content, conducting commerce, and connecting customers. Therefore, this study adopts the four dimensions of social network application adoption from Wirtz, Schilke, and Ulrich (2010) because the classification of the four dimensions matches the business goals of the 4C strategy. The four dimensions are (1) social network; (2) interaction orientation; (3) customization; and (4) user-added value (Wirtz et al., 2010).

A social network is a technically structured network for users to interact for the purposes of building relationships and image, obtaining resources, or gaining information. The interaction orientation aspect of Web 2.0 for CRM means that the Web technology supports interactions and information sharing among users for creating new or improved products/services based on constant communication with customers (Cooke & Buckley, 2008). Customization in the Web 2.0 environment enables a large number of users to choose their favorite products/services in the virtual world with a minimum level of service resources (Wirtz et al., 2010). Like customization, user-added value denotes that Web 2.0 has enabled customers to be an organization's value-creation partner by efficiently sharing innovative ideas through social networks (Bughin et al., 2009; Sigala, 2011). Wirtz et al. (2010) further pointed out that to obtain the benefits of social CRM, organizations cannot depend solely on increasing investment on social software and technology. They must also develop a CRM strategy surrounding both market integration and customer integration to align with social technology capability.

The 4C Strategy

The 4C strategy was proposed to replace the traditional 4P strategy, which focused on marketing via product, price, place, and promotion (Kotler et al., 1999). The 4C strategy helps organizations transform themselves into a customer-orientated organization, develop an action plan concerning customer-oriented marketing, and respond to the demands of e-commerce. The 4C strategy includes four aspects: (1) customer demand; (2) customer cost; (3) convenience; and (4) communication (Kotler, Armstrong, Saunders, & Wong, 1999). Critical issues of the customer demand aspect involve how to provide customers with the needed product/service and how to predict their current and future purchases. Characteristics of customer demand include a 360-degree view of a customer based on integrated data, a customer-centric environment, mass customization and personalization, and downloadable products and services (Kotler et al., 1999; Krueger et al., 2003). Customer cost aspect concerns both the monetary cost for the customer to obtain a product/service and the costs of purchasing (i.e., time cost, effort cost, psychological cost, and other intangible costs). The spirit of 4C strategy advocates cost reduction through e-marketing, segmented pricing, and zero-based pricing (Kotler et al., 1999; Krueger et al., 2003). The convenience aspect in the 4C strategy addresses rapid delivery and instant service. For the Web as distribution channel, the focal issues for research include immediate access, direct selling, and disintermediation/new intermediaries (Kotler et al. 1999; Krueger et al., 2003). Finally, the communication aspect tackles critical issues regarding building collaborative relationships with customers and converting customers into business partners. Main characteristics of communication include customer-generated content, customers as an integral part of product/service/brand, multichannel communication, and online advertising and promotion (Kotler et al., 1999; Krueger et al., 2003).

The 4C strategy was proposed for organizations to deal with challenges from marketing and CRM in the Internet age. Yet, it is still unclear how this strategy aligns with various kinds of social technology and how it guides social CRM activities.

IT-Business Alignment

Prior research on IT-business alignment can be grouped into three categories. The first topic is the conceptualization and measurement of alignment. For example, Venkatraman (1989) conceptualized alignment (fit) from six different perspectives: (1) fit as moderation; (2) fit as mediation; (3) fit as

matching; (4) fit as covariation; (5) fit as profile deviation; and (6) fit as gestalts. The terms alignment and fit are interchangeable in this study.

The second topic contains a range of studies investigating levels of alignment. The alignment levels range from strategy level and structure level to process/technology level and individual level. Chan et al. (1997) used an empirical study to confirm the positive relationships among organization strategy orientation, information systems strategy orientation, and information systems strategy alignment, and the impact of perceived effectiveness of the information system on organization performance. Tallon (2007) found a positive association between alignment and perceived IT business value in primary processes in the value chain. Chong et al. (2011) studied the effects of the employee level of IT-business alignment.

The last topic is the investigation antecedents and consequences of alignment in causal structures. Preston and Karahanna (2009) found that shared understanding, which is influenced by shared language, chief information officer (CIO) business knowledge, and the top management team's IS knowledge is a proximal antecedent of information system strategic alignment. Huang (2012) found that IT management sophistication impacts business-IT strategic alignment in terms of plan, control, organization, and integration.

However, research on alignment in the context of social CRM, especially alignment between social network technology and the 4C CRM strategy, has been rare. Given the increasing popularity of social CRM activities in large and small organizations, this study examines alignment in a causal structure by using the following competing models as suggested by literature: (1) covariation model; and (2) direct effect model (Bergeron, Raymond, & Rivard, 2001; Venkatraman, 1989). The covariation model validates alignment from a holistic and systematic perspective. It examines how variables from the 4C CRM strategy and social network technology collectively and simultaneously define CRM performance via a coherent fit covariation (Bergeron et al., 2001; Venkatraman, 1989). On the other hand, the direct effect model explores the ideal pattern of alignment by looking at the direct effect from the 4C CRM strategy and social network technology on CRM performance (Bergeron et al., 2001; Venkatraman, 1989). In this research, alignment refers to strategic alignment defining as the extent to which an organization's IT missions and goals on social network technology matches the missions and goals of its social CRM strategy (Bergeron et al., 2001).

Hypotheses Development

Strategic selection and use of IT can enhance business performance and competitive advantage (Porter, 2001). In other words, the key to efficiently improving organizational performance through IT investment is business strategy (Prahalad & Krishnan, 2002). Li and Ye (1999) found that alignment between business strategy and chief executive officer/CIO interactions, and between IT investment and environmental dynamics influenced business performance. Gefen and Ragowsky (2005) found that enterprises could derive greater benefits from ERP installation when they fit an organization's specific needs and characteristics with the ERP. Ragowsky, Stern, and Adams (2000) found that different organizational benefits were derived from IS applications, including customer and supplier applications.

According to the covariation model of fit (Venkatraman, 1989), coalignment between IT and business strategy is the key to business performance. Empirical evidence showed that relational information processes focusing on customer information collection and usage played a vital role in enhancing an organization's CRM performance (Jayachandran et al., 2005). It also showed that management strategy changes that effectively support CRM activities improved CRM performance (Ryals, 2005). In applying the covariation model of fit to the current research context, we argued that the 4C strategy is highly customer-oriented. Therefore, carrying out the 4C strategy requires strong support from IT to enable data integration, interactive communication channels, customer engagement, and customer contribution. On the other hand, social network technologies based on Web 2.0 technology are designed for instant interaction and collective intelligence creation (Wirtz et al., 2010). Prior

research showed that social networking technologies were effective real-time channels for customers to share experiences and opinions with respect to the organizations' products (Baird & Parasnis, 2011). Prior research also found that the use of social network technology enabled organizations to establish customer knowledge bases. Therefore, organizations could be more efficient in providing customized/personalized products or services and promptly respond to customer complaints (Ballings & Van den Poel, 2015). Prior research further showed that social networking technology supporting customer communication and collaborative social experiences (i.e., enabling customers to share opinions on online communities) improved social CRM performance (Baird & Parasnis, 2011). Based on the covariation model of fit, as well as adopting the theoretical foundation of alignment from Bergeron et al. (2001) and Venkatraman (1989), we argue that a match between the 4C strategy and social network applications would be a steroid for CRM performance. In other words, through social network technology, organizations should become more efficient when implementing the 4C strategy to enhance customer satisfaction and retention. Based on the above rationale, we hypothesize H1 and use Figure 1 to explain the variables and relationships involved in H1.

H1: Alignment between the 4C strategy and social network applications has a significant impact on CRM performance.

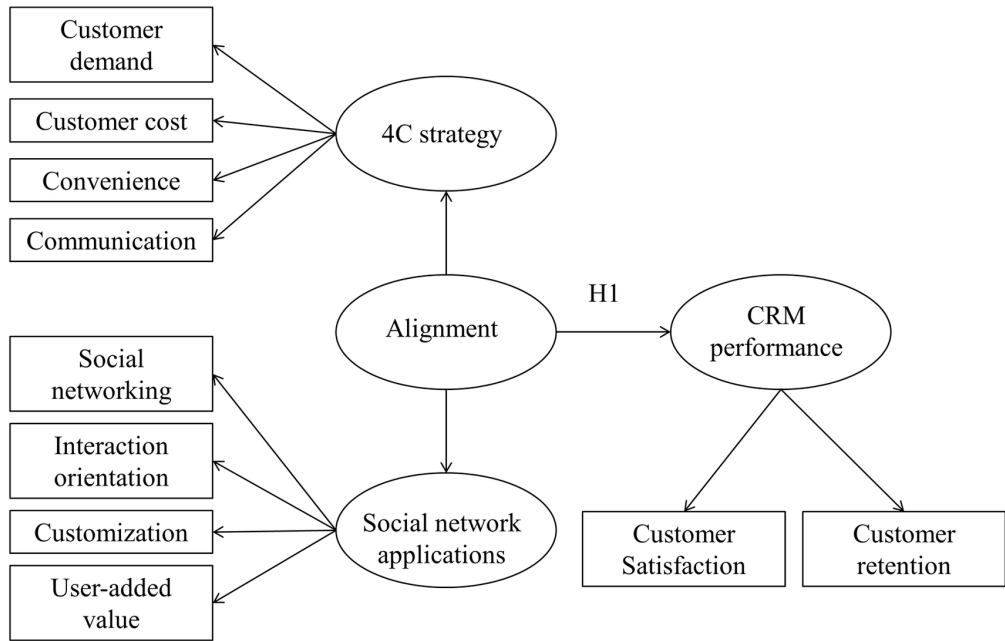
Figure 1 shows that the model hinges on three piers: (1) the 4C strategy proposed by Kotler et al. (1999), including customer demand, customer cost, convenience, and communication; (2) social network application types proposed by Wirtz et al. (2010), including social network, interaction orientation, customization, and user-added value; and (3) business-IT alignment (Venkatraman, 1989). The model investigates the impact of alignment (as covariation) between social network applications and the 4C strategy on CRM performance based on the theoretical foundation of the fit as covariation. This is a system approach that treats the 4C strategy, social network applications, and CRM performance as second-order, multidimensional constructs while examining the aggregated relationships among those constructs (Chan et al., 1997; Venkatraman, 1989).

The 4C strategy, which focuses on customer-oriented relationship management, views customers as important assets to an organization (Kotler et al., 1999). Implementation of the 4C strategy could significantly change organizational culture, as well as influence an organization's mission, goals, and strategic plan (Jayachandran et al., 2005). The 4C strategy can guide an organization to direct its resources on changing its business plans, initiatives, and processes to include a customer relationship orientation. Past research found that customer-oriented strategy positively impacted relational information processes (Jayachandran et al., 2005). Prior study also found that customer-oriented strategy focused on customer engagement and insight produced values throughout the value chain and enhanced business performance (Woodcock, Green, & Starkey, 2011). Following the direct effect model of fit (Venkatraman, 1989), given the match of the goal in customer insight and engagement between the 4C strategy and social CRM, we argue that an ideal profile for social CRM strategy is to fully implement the 4C strategy. This leads to ideal CRM performance. Hence, we hypothesize H2.

H2: A higher level adoption of the 4C strategy contributes to a higher level of CRM performance.

Past research found that social networks open a new era for organizations to efficiently and inexpensively achieve CRM goals, including customer communication, product development, and branding promotion (Cooke & Buckley, 2008). A survey found that interaction on social networks allowed organizations to gain more customer information, including customer reviews, customer behaviors, and customer knowledge (McAfee, 2009). By analyzing and utilizing data contributed by customers on social networks, organizations can study customer behaviors, enhance customer perceptions on products/services, understand customer needs and expectations, improve the design

Figure 1. Covariation model of fit



of products/services, provide customized/personalized products/services, and, ultimately, increase customer satisfaction and retention (Cooke & Buckley, 2008; McAfee, 2009). We argue that social network functions (i.e., blogs and social community sites) enable an organization to reach customers. Therefore, the relationship between the organization and its customers can be strengthened. Empirical evidence showed that social networks provided an additional access channel to organization information and allowed customers to receive immediate communication from an organization. As a result, customer satisfaction increased (Bughin et al., 2009).

Moreover, Wirtz et al. (2010) pointed out that social network technology enables organizations to easily release new product information, invite customers to participate in the feedback loop for product/service innovations, and harness collective intelligence. They also pointed out that customer participation leads to enhanced customer perceptions on the product/service, reduced customer search cost, and increased customer switching cost (Wirtz et al., 2010). This results in improved customer satisfaction and retention. In addition, Bughin et al. (2009) found that user contribution and creation have become a trend. When organizations followed the trend to provide tools and functions to facilitate contribution and creation, they extracted knowledge and useful information from user-contributed content and improved performance.

Following the direct effect model of fit (Venkatraman, 1989), based on the above reasoning, we argue that Web 2.0 technology shares goals with social CRM (i.e., social networking, information sharing and contributing, and instant interaction). Hence:

H3: A higher level of adoption of social network applications contributes to a higher level of CRM performance.

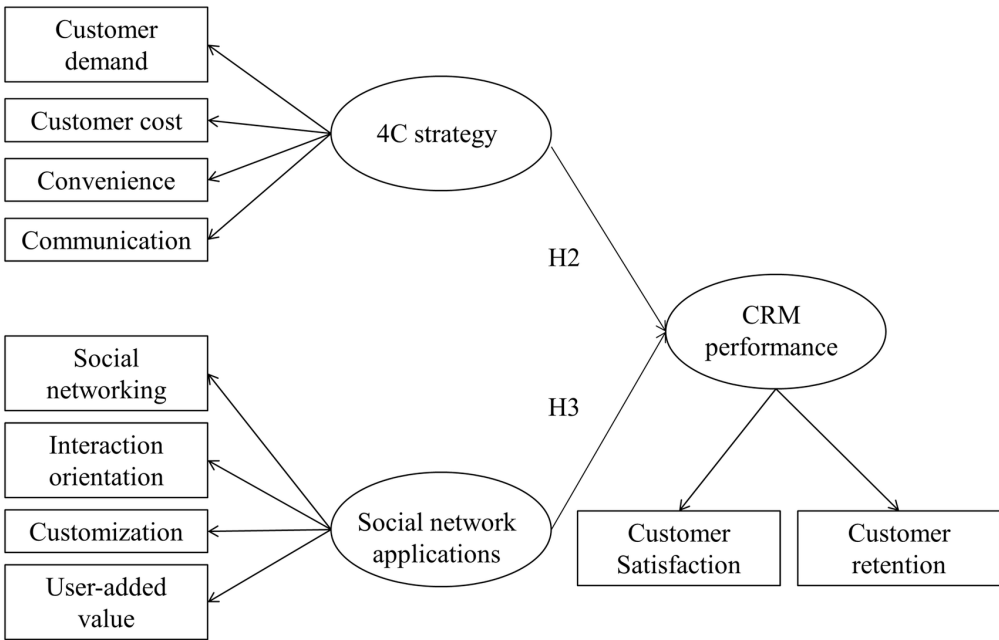
Figure 2 depicts H2 and H3 in the competing model (Venkatraman, 1989). Different from the model in Figure 1, the competing model in Figure 2 shows that alignment between the independent and dependent variables is directly tested.

RESEARCH METHOD

This study, based on Kotler et al. (1999), treats the 4C strategy as a marketing strategy with customer orientation as the basis. Based on an intensive literature review, items for customer demand, customer cost, and communication were adapted from Collier and Bienstock (2006). This study adopted the dimensions of the social network applications proposed by Wirtz et al. (2010). Detail items for social network and user-added value were adapted from Jayachandran et al. (2005). Customization items were adapted from Liang, Lai, and Ku (2007). Interaction orientation items were self-developed. Measurement items of CRM performance, including customer satisfaction and customer retention, were adapted from Cyr, Kindra, and Dash (2008) and Ranaweera and Prabhu (2003), respectively. A seven-point scale was used for each item in the measurement (1 = strongly disagree to 7 = strongly agree).

This study used a survey to collect data. The survey questionnaire was pilot-tested among five graduate students in a university in Taiwan. All students had full-time jobs and access to IT information in their organizations. Their feedbacks were used to refine the questionnaire. The survey for primary data collection was conducted among Taiwanese firms that had adopted Web 2.0 applications for marketing purposes. The list of firms was collected through Facebook. The survey used both paper-

Figure 2. Competing model-direct effect model



based questionnaires administered in person and online questionnaires administered using Facebook messages and the Facebook search function.

The total number of questionnaires received was 261. After deleting outliers and incomplete questionnaires, 225 were considered as effective and were utilized for the final analysis. Respondents included executives and managers of salespersons, customer service, and IT departments. The demographic analysis showed that most surveyed companies were in the food and grocery industry (28.4%). Of the companies, 43.6% were in the industry for less than 5 years, 30.2% for 11-15 years, and 26.2% for at least 16 years. Regarding financial capital, 44.4% had 1 million Taiwan dollars or less, 22.7% had 1-5 million Taiwan dollars, and 32.9% had more than 5 million Taiwan dollars (1 million Taiwan dollars = 0.33 million USD).

RESULTS

This study collected data via a cross-sectional study in which both dependent and independent variables were simultaneously collected. The common method bias (CMB) was a potential concern. We, therefore, conducted the Harman's single-factor analysis following Podsakoff, MacKenzie, and Lee's (2003) recommendations. We also conducted a confirmatory factor analysis with and without a latent common method variance factor. The results of the tests showed that CMB was less of a concern.

We then tested construct validity and found that the Cronbach's α values for first-order constructs ranging from 0.764 to 0.914 were all greater than the recommended threshold value of 0.7 (Nunnally, 1978). The average variance extracted (AVE) values, excluding for convenience, exceeded the benchmark value of 0.5. The AVE value for convenience was 0.49, which was very close to 0.5. All composite factor reliability (CFR) values ranging from 0.768 to 0.916 were also above the cutoff value of 0.70. Thus, the results supported construct reliability (Fornell & Larcker, 1981; Segars, 1997). Furthermore, all items were loaded to the construct as intended and factor loadings were greater than the acceptable threshold of 0.7. Each construct's square root of AVE was greater than the correlations of this construct with other constructs. Therefore, the results supported construct convergent and discriminant validity (Fornell & Larcker, 1981).

Following Venkatraman (1989), we checked the measurements for the 4C CRM strategy, social network application, and CRM performance, and conducted model estimation using Mplus 5.0. Table 1 reports the results. For the measurements of the three second-order constructs, all comparative fit index (CFI) and Tucker-Lewis index (TLI) values were greater than the acceptable threshold of 0.9. All root mean square error of approximation (RMSEA) values, except for the CRM performance measurement, were less than the benchmark of 0.6. All $\chi^2/\text{d.f.}$ values were less than the threshold of 3.0. Moreover, loadings from the first order factors to the corresponding second-orders were all statistically significant with the $p < 0.001$. The results established the measurements for the 4C CRM strategy, social network application, and CRM performance (Bentler, 1992; Bentler & Bonnett, 1980).

To test H1, we adopted the approach of the fit as covariation as shown in Figure 1 and suggested by Bergeron et al. (2001) and Venkatraman (1989). The fit as covariation model, in which the 4C strategy and social network application as two second-order constructs were coaligned to form a higher-order construct alignment which in turn impacted CRM performance, was estimated. Figure 3 reported the results of the covariation model estimation. The path coefficient from alignment to CRM performance was 0.69 with $p < 0.001$. The results supported H1.

To test H2 and H3, the direct effect model was estimated. As shown in Figure 2, the direct effect model directly examines the impact of the 4C CRM strategy and social network application as second-order constructs on CRM performance (Bergeron et al., 2001; Venkatraman, 1989). The results shown in Figure 4 supported both hypotheses.

As shown in Table 1, Figure 3, and Figure 4, all fits indexes of the covariation model were better than the recommended cutoff values and not significantly different from those of the direct effect model. Target T was 0.981, which was very close to 1. In addition, the R^2 value for CRM performance

Table 1. Results of measurement and model fit

Models	$\chi^2/\text{d.f.}$	CFI	TLI	RMSEA
4C Strategy Measurement	1.29	.985	.981	.036
Social Application Measurement	1.12	.993	.991	.023
CRM Performance Measurement	2.58	.962	.938	.084
Direct Effect Model	1.65	.916	.907	.054
Covariation Model	1.68	.912	.907	.055

Notes: Evaluation criteria: $\chi^2/\text{d.f.} < 3.0$; CFI > 0.9 ; TLI > 0.9 ; RMSEA < 0.6 (Bentler, 1992; Bentler & Bonnett, 1980)

in the covariation model was 47%. This was better than 43% in the direct effect model, which indicated that the covariation model had more explanation power.

To understand more details about H1 (the alignment and its impact), this study conducted the post hoc analyses on the fit as mediation and fit as a gestalt (Bergeron et al., 2001; Venkatraman, 1989). According to Baron and Kenny (1986), testing the fit as mediation needs to perform two steps: (1) testing if the independent variable has significant impact on the dependent variable (direct effect model); and (2) testing if the direct effect from the independent variable to the dependent variable has reduced when the mediator is added into the direct effect model. In this study, both direct and indirect effects of the social applications on CRM performance via the 4C strategy were analyzed. The results are shown in (a) and (b) of Figure 5, respectively.

Figure 3. Results of the covariation model of fit

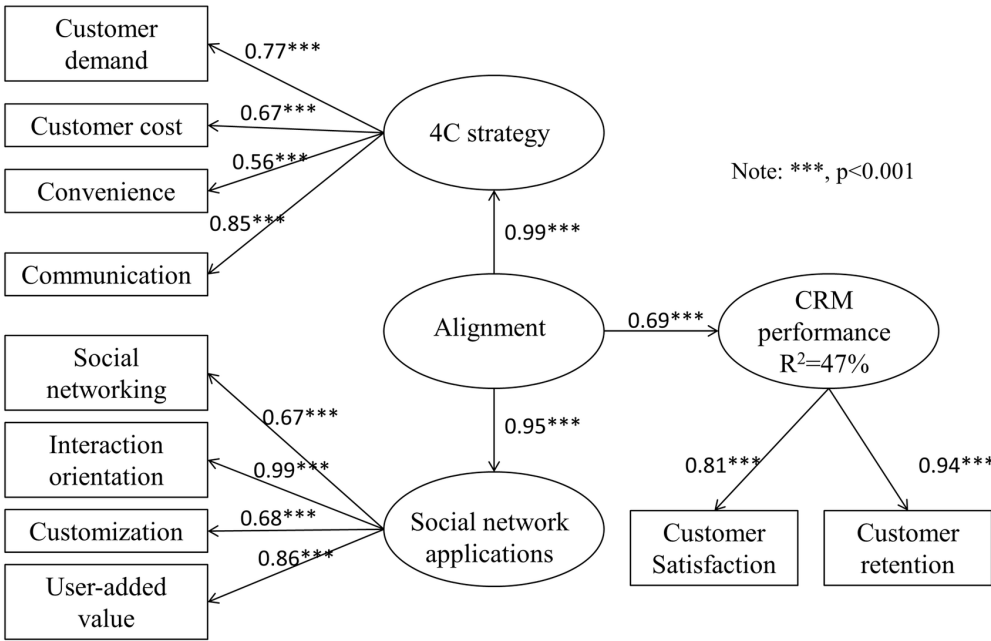
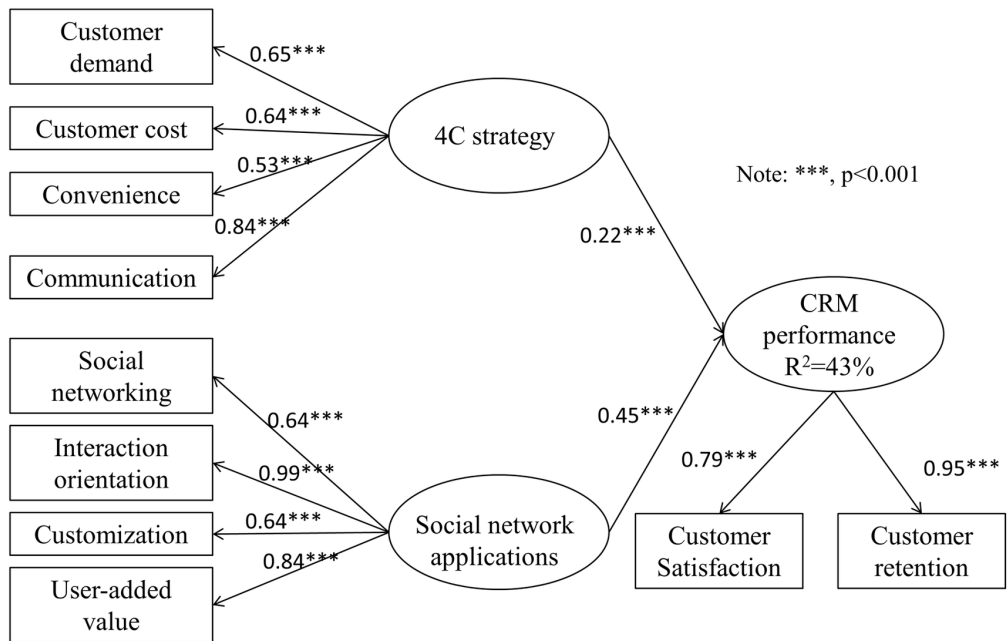


Figure 4. Results of the direct effect model

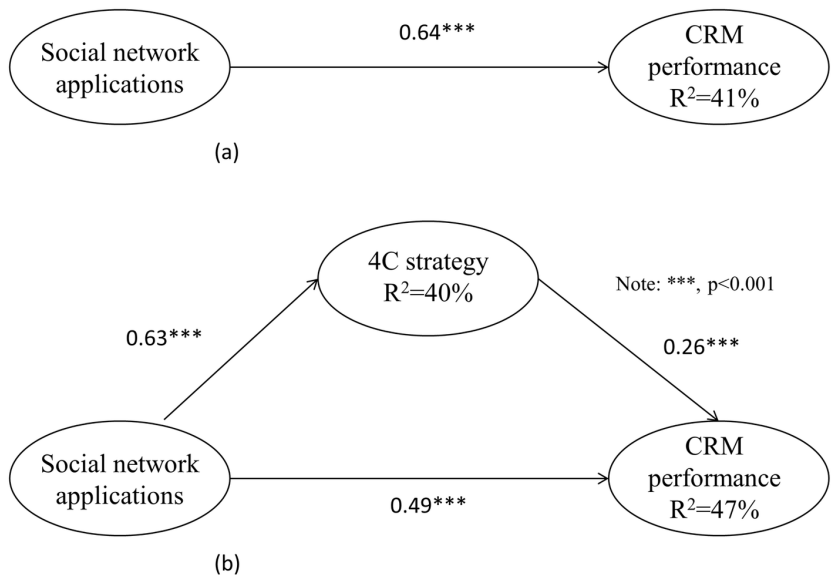


As shown in Figure 5(b), the paths from social network application to the 4C strategy and to CRM performance were significant with the path coefficients of 0.63 and 0.26, respectively. The estimated coefficient for the direct effect of social applications on CRM performance was 0.49 with a p -value < 0.001 . In a comparison between Figure 5(a) and Figure 5(b), the direct effect of social applications on CRM performance reduced from 0.64 to 0.49. This means that 4C strategy was the mediating factor between social network applications and CRM performance. The mediating effect indicated that social network applications needed to fit with 4C strategy to maximize their impacts on CRM performance. The post hoc results also supported H1.

This study also conducted a post hoc cluster analysis, a key method of analyzing fit as a gestalt, to further test whether H2 and H3 are supported from a gestalt perspective of fit (Bergeron et al., 2001; Venkatraman, 1989). Venkatraman (1989) believed that gestalt concerns the congruence among variables. This congruence only represents a contingent status of the relationship, which means the structure of relationship will change in line with the change of values of variables to maintain a new balance (Venkatraman, 1989). The 4C strategy and social network application constructs were used in the hierarchical cluster analysis with Ward's (1963) method to determine groups. The cluster analysis resulted in three groups (see Table 2).

The study identified three patterns by analyzing the patterns of the means of the 4C strategy, social network applications, and CRM performance: (1) a high-level implementation of the 4C strategy and social network applications associated with high CRM performance; (2) a medium-level implementation of the 4C strategy and social network applications associated with medium CRM performance; and (3) a low-level implementation of the 4C strategy and social network

Figure 5. Results of model estimation for fit as mediation



applications associated with low CRM performance. These groups were named high, medium, and low performance groups.

ANOVA analyses of the mean differences of 10 constructs showed that three groups were significantly different in the 4C strategy, social network applications, and CRM performance with p-values less than 0.001 and F-values (d.f. 222, 2) ranging between 22.05 and 125.49 (see Table 3). The post hoc tests on group comparisons using the Scheffe method for all 10 constructs showed that group 1 was significantly different from groups 2 and 3 in customer demand, customer cost, communication, social network, interaction orientation, user-added value, and retention. Group 3 was significantly different from groups 1 and 2 in convenience. All three groups were significantly different in customization and customer satisfaction. The results showed that to achieve ideal CRM

Table 2. Three groups from the cluster analysis

Cluster	Means of Cluster Variables										Pattern
	1	2	3	4	5	6	7	8	9	10	
g1 (n = 92)	4.54	5.16	4.35	5.01	5.13	4.86	4.54	4.70	4.92	5.06	Low
g2 (n = 41)	5.56	4.30	4.04	6.12	6.34	6.16	5.20	6.06	5.54	5.78	Medium
g3 (n = 92)	5.61	5.17	5.93	6.44	6.35	6.45	6.02	6.19	5.95	6.19	High

Note: 1 = customer demand, 2 = customer cost, 3 = convenience, 4 = communication, 5 = social network, 6 = interaction orientation, 7 = customization, 8 = user-added value, 9 = customer retention, 10 = customer satisfaction

performance, an ideal adoption pattern for the 4C strategy is to well impendent all four components in the strategy to guide social CRM activities in organizations, and an ideal pattern for social network applications is to well adopt all dimensions to support various social CRM activities. These findings supported H2 and H3.

DISCUSSION

The analysis results support all three proposed hypotheses in this study. In terms of H1, hypothesizing a positive effect of the alignment between the 4C strategy and social network applications on CRM performance, the findings from the test method of the fit as covariation indicated that IT-business alignment is essential for guiding social CRM activities to achieve high CRM performance. While social network applications supported by Web 2.0 technology are user-oriented and allow organizations to more effectively communicate and interact with customers, organizations still need a customer-oriented CRM strategy to guide their social CRM investments and activities. Moreover, the relatively high path coefficient of 0.69 in Figure 3 pointed out that alignment between the 4C strategy and social network applications would pay off the organization on CRM performance.

The results from the test method of the fit as mediator decomposed the effects of social network applications on CRM performance into direct and indirect effects. The significant indirect effect provided insight on how much the alignment of the technology and the 4C strategy could improve CRM performance. The results also showed that misalignment between the 4C strategy and social network applications leads to low CRM performance.

H2 hypothesized that an ideal adoption pattern of the 4C strategy was high-level implementation. This was also supported. The findings showed that each part of the 4C strategy had a focus and addressed different CRM issues to achieve high CRM performance. It is important that each of the four parts is emphasized in organizations. The findings confirmed that the customer-oriented 4C strategy may enable an organizational culture of customer engagement and insight for creating loyal and high-value customers. The findings also indicated that fully implementing the 4C strategy may be essential in providing guidelines for organizations and employees on how to engage and interact with customers via social network platforms.

H3, which hypothesized that an ideal pattern of social network applications for CRM is their high-level adoption, was supported. Advances in Web 2.0 technology have been creating technologically savvy customers who are comfortable with using various Web technologies and applications. The findings of this study indicate that organizations need to implement a full range of social network applications when dealing with such customers. Low-level adopting of such applications may indicate an organization's lack of customer-oriented culture and strategy, which results in low CRM performance.

Negative effects and customer relationship disasters of online social media were often found in the business world (Barbara, 2012). No proper policies and strategies on online social media in

Table 3. Mean difference tests for constructs in three groups

Construct	F-value (222, 2)	P-value	Construct	F-value (222, 2)	P-value
Customer Demand	31.84	.000	Interaction orientation	125.49	.000
Customer Cost	38.20	.000	Customization	58.43	.000
Convenience	94.00	.000	User-added value	66.67	.000
Communication	70.92	.000	Retention	22.04	.000
Social Network	42.60	.000	Satisfaction	44.81	.000

organizations is a major reason for such negative effects and disasters. Thus, the 4C strategy can be a benchmark for a corporation to establish policies and guidelines to embrace social network applications. In turn, they can prevent or manage effects of online social media and eventually achieve high CRM performance.

Furthermore, the emergence of three groups in the cluster analysis indicates the existence of different stages of IT-business strategy alignment in social CRM. In the high-performance group, enterprises were more advanced in adopting social network technology. They demonstrated a high level of implementing the 4C strategy. On the other hand, in the low performance group, organizations showed a low-level adoption of social network technology and the 4C strategy. Organizations in the medium performance group are in the intermediate level of adoption of social network technology and the 4C strategy. The findings imply that IT-business strategy fit may follow an evolutionary path in which different stages of alignment evolution exhibit different levels of CRM technology and business strategy integration and adoption of different CRM enabling technologies (Sen & Sinha, 2011). The findings are consistent with prior studies on dynamic alignment (e.g. Baker et al., 2011; Sen & Sinha, 2011). The findings of this study imply that organizations need to integrate appropriate 4C strategy and social technologies at every stage to support a better social CRM performance.

A notable finding in the cluster analysis is that the implementation of 4C strategy is positively associated with customer performance. This is not a case for customer cost and convenience. The finding supports that an organization needs to satisfy customer demand and maintain an interactive communication channel with customers to increase its CRM performance. However, the means of the 4C strategy of customer cost and convenience are higher in the low performance group than in the medium performance group. This shows that reducing customer cost and increasing customer convenience are not enough to gain high CRM performance at certain stages of CRM adoption.

The reason may be that an organization pays more attention to the convenience of CRM mechanism and how it can reduce transaction time when the organization has a low CRM performance (normally a low level of CRM adoption). At this stage, customers are more easily impressed by changes in efficiency and convenience from the new CRM mechanism. Once the CRM performance has increased to a certain level (normally a middle level of CRM adoption), the factors of reducing customer cost and increasing customer convenience are not as crucial as before because customers already used to the CRM mechanism. Yet, to achieve high CRM performance (normally a high level of CRM adoption), the organization must implement all four aspects of 4C strategy.

CONCLUSION

In the era of Web 2.0, users have changed from information recipients to information creators and owners. They have become an integral part of branding, product innovation, and product promotion through social network platforms. However, how emerging social network technology aligns with CRM strategy is unclear. Thus, this study investigates alignment and its impact on CRM performance. It also identifies ideal adoption patterns for the 4C strategy and social network applications in the social CRM environment.

The results of this study support that the alignment of 4C strategy and social network applications has a significant effect on CRM performance. The results also demonstrate that organizations need to adopt Web 2.0 business strategies to take advantage of social network technology. Adopting the 4C strategy to support and guide the use of social network applications can provide significant improvement in CRM performance in organizations.

Moreover, the 4C strategy may serve as a benchmark for developing policies and guidelines surrounding social network technology to achieve high CRM performance. The results indicate that the ideal adoption pattern for the 4C strategy and social network applications is to integrally implement all parts of the 4C strategy and all types of social network applications. However, in reality, various limitations may keep organizations from fully implementing the strategy and technologies. Thus,

a key take-away from the results of this study is that organizations need to adopt the strategy and technology in parallel and to integrate them into CRM practice to achieve high CRM performance.

This study provides several contributions. First, the study furthers our understanding of IT-business strategy alignment in the context of social CRM. Particularly, the study points out that organizations need a high-level adoption of both social technology and customer-oriented CRM strategy to achieve high CRM performance. This finding is especially important to organizations that are investing in social network technology for social CRM. Organizations should seek a full-range of social network applications with social network, customization, and various communication functions to facilitate customer insight and engagement. Organizations may integrate data from various social network applications to better understand and serve customers.

Second, this study links the academic area of 4C strategy with social CRM. The 4C strategy was proposed to address issues in e-commerce. Yet, to the best of our knowledge, it has not been tested on the emerging trend of CRM. This study builds a theoretical foundation to guide social CRM and assess social CRM performance in organizations. The 4C strategy could be a solution for organizations that are struggling to find an appropriate strategy to guide social CRM investment and activities.

Third, this study advances our understanding on social dimensions of social network software for social CRM. To maintain competitive advantage, organizations need to provide social network platforms to allow customers to express themselves and offer a listening platform. Organizations also need to utilize data collected from social platforms to personalize products/services and improve customer service.

Finally, this study provides insight into social CRM technology and strategy in Taiwanese companies. Taiwan, as a collectivism society, is community orientated. People seek and value “word of mouth” from online and offline communities. Companies targeting markets in collectivism societies like Taiwan may need to value more social CRM activities because they boost CRM performance.

This study has several limitations which may be addressed in future research. The surveys conducted in this study only reached a portion of companies in Taiwan. Many respondents were salespersons and company IT staff. Therefore, caution should be taken when generalizing the results of this study to other populations, especially populations in other countries. A cross-national study in the future could mitigate this concern. Finally, this study utilized Facebook as the research medium. Consequently, this study may not address alignment issues on other social platforms that carry different characteristics than Facebook. A future study on other social platforms, especially emerging social platforms (i.e Google Plus) may provide additional insight into the alignment issues in social CRM.

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REFERENCES

- Andriole, S. J. (2010). Business impact of Web 2.0 technologies. *Communications of the ACM*, 53(12), 67–79. doi:10.1145/1859204.1859225
- Baird, C. H., & Parasnis, G. (2011). From social media to social customer relationship management. *Strategy and Leadership*, 39(5), 30–37. doi:10.1108/10878571111161507
- Baker, J., Jones, D. R., Cao, Q., & Song, J. (2011). Conceptualizing the dynamic strategic alignment competency. *Journal of the Association for Information Systems*, 12(4), 299–322. doi:10.17705/1jais.00265
- Ballings, M., & Van den Poel, D. (2015). CRM in social media: Predicting increases in Facebook usage frequency. *European Journal of Operational Research*, 244(1), 248–260. doi:10.1016/j.ejor.2015.01.001
- Barbara, J. (2012, November 11). *Is social media bad for business?* Retrieved November 11, 2012, from <http://www.forbes.com/sites/julietbarbara/2012/11/11/is-social-media-bad-for-business/>
- Baron, R. M., & Kenny, D. A. (1986). The moderator-mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology*, 51(6), 1173–1182. doi:10.1037/0022-3514.51.6.1173 PMID:3806354
- Bentler, P. M. (1992). On the fit of models to covariances and methodology to the Bulletin. *Psychological Bulletin*, 112(3), 400–404. doi:10.1037/0033-2909.112.3.400 PMID:1438635
- Bentler, P. M., & Bonnett, D. G. (1980). Significance tests and goodness of fit in the analysis of covariance structures. *Psychological Bulletin*, 88(3), 588–606. doi:10.1037/0033-2909.88.3.588
- Bergeron, F., Raymond, L., & Rivard, S. (2001). Fit in strategic information technology management research: An empirical comparison of perspectives. *Omega*, 29(2), 125–142. doi:10.1016/S0305-0483(00)00034-7
- Bughin, J., Chui, M., & Miller, A. (2009). How companies are benefitting from Web 2.0: McKinsey global survey results. *The McKinsey Quarterly*, 46(3), 10–17.
- Bughin, J. R. (2007). How companies can make the most of user-generated content. *The McKinsey Quarterly*. Retrieved from <http://www0.cs.ucl.ac.uk/staff/d.quercia/others/ugc.pdf>
- Cannon, J. P., & Homburg, C. (2001). Buyer-supplier relationships and customer firm costs. *Journal of Marketing*, 65(1), 29–43. doi:10.1509/jmkg.65.1.29.18136
- Chan, Y. E., Huff, S. L., Barclay, D. W., & Copeland, D. G. (1997). Business strategic orientation, information systems strategic orientation, and strategic alignment. *Information Systems Research*, 8(2), 125–150. doi:10.1287/isre.8.2.125
- Chen, J.-S., & Ching, R. K. H. (2004). An empirical study of the relationship of IT intensity and organizational absorptive capacity on CRM performance. *Journal of Global Information Management*, 12(1), 1–17. doi:10.4018/jgim.2004010101
- Chong, A. Y., Ooi, K., Chan, F. T. S., & Darmawan, N. (2011). Does employee alignment affect business-IT alignment? An empirical analysis. *Journal of Computer Information Systems*, 51(3), 10–20.
- Collier, J. E., & Bienstock, C. C. (2006). Measuring service quality in e-retailing. *Journal of Service Research*, 8(3), 260–275. doi:10.1177/1094670505278867
- Cooke, M., & Buckley, N. (2008). Web 2.0, social networks and the future of market research. *International Journal of Market Research*, 50(2), 267–292. doi:10.1177/147078530805000208
- Cyr, D., Kindra, G., & Dash, S. (2008). Website design, trust, satisfaction, and e-loyalty: The Indian experience. *Online Information Review*, 32(6), 773–790. doi:10.1108/14684520810923935
- De Hertogh, S., Viaene, S., & Dedene, G. (2011). Governing Web 2.0. *Communications of the ACM*, 54(3), 124–130. doi:10.1145/1897852.1897882
- Enrico, R. (2007). Web 2.0 meets CRM 2.0. *Retail Merchandiser*, 47(6), 42–43.

- Fornell, C., & Larcker, D. F. (1981). Evaluating structural equations models with unobservable variables and measurement error. *Journal of Marketing Research*, 18(1), 39–50. doi:10.2307/3151312
- Gartner. (2013). *Gartner says 80 percent of social business efforts will not achieve intended benefits through 2015* [Press release]. Retrieved May 27, 2013, from <http://www.gartner.com/newsroom/id/2319215>
- Gefen, D., & Ragowsky, A. (2005). A multi-level approach to measuring the benefits of an ERP system in manufacturing firms. *Information Systems Management*, 22(1), 18–25. doi:10.1201/1078/44912.22.1.20051201/85735.3
- Heskett, J. L., Thomas, O. J., Gary, W. L., Earl, W. S., & Leonard, A. S. (1994). Putting the service-profit chain to work. *Harvard Business Review*, 72(2), 164–174.
- Hoegg, R., Martignoni, R., Meckel, M., & Stanoevska, K. (2006). Overview of business models for Web 2.0 communities. In Proceedings of GeNeMe (pp. 23-37). Germany: Dresden.
- Huang, L. K. (2012). The impact of IT management sophistication on perceived IT importance in strategic alignment. *Journal of Computer Information Systems*, 53(2), 50–64.
- Jayachandran, S., Sharma, S., Kaufman, P., & Pushkala, R. (2005). The role of relational information processes and technology use in customer relationship management. *Journal of Marketing*, 69(4), 177–192. doi:10.1509/jmkg.2005.69.4.177
- Kotler, P., Armstrong, G., Saunders, J., & Wong, V. (1999). *Principles of marketing*. London, UK: Prentice Hall.
- Krueger, C. C., Lu, N., & Swatman, P. M. C. (2003). Success factors for online music marketing—eTransformation: From the four P's to the four C's. In Proceedings of Collaborative Electronic Commerce Technology and Research (COLLECTeR). Santiago, Chile.
- Li, M., & Ye, L. (1999). Information technology and firm performance: Linking with environmental, strategic and managerial contexts. *Information & Management*, 35(1), 43–51. doi:10.1016/S0378-7206(98)00075-5
- Liang, T. P., Lai, H. J., & Ku, Y. C. (2007). Personalized content recommendation and user satisfaction: Theoretical synthesis and empirical findings. *Journal of Management Information Systems*, 23(3), 45–70. doi:10.2753/MIS0742-1222230303
- McAfee, A. P. (2009). Shattering the myths about enterprise 2.0. *Harvard Business Review*, 87(11), 1–6.
- Nunnally, J. (1978). *Psychometric theory*. New York, NY: McGraw-Hill.
- Pan, S. L., & Lee, J. N. (2003). Using e-CRM for a unified view of the customer. *Communications of the ACM*, 46(4), 95–99. doi:10.1145/641205.641212
- Payne, A., & Frow, P. (2005). A strategic framework for customer relationship management. *Journal of Marketing*, 69(4), 167–176. doi:10.1509/jmkg.2005.69.4.167
- Podsakoff, P. M., MacKenzie, S. B., Lee, J. Y., & Podsakoff, N. P. (2003). Common method biases in behavioral research: A critical review of the literature and recommended remedies. *The Journal of Applied Psychology*, 88(5), 879–903. doi:10.1037/0021-9010.88.5.879 PMID:14516251
- Porter, M. E. (2001). Strategy and the internet. *Harvard Business Review*, 79(3), 63–78. PMID:11246925
- Prahalad, C. K., & Krishnan, M. S. (2002). The dynamic synchronization of strategy and information technology. *MIT Sloan Management Review*, 43(4), 24–33.
- Preston, D. S., & Karahanna, E. (2009). Antecedents of IS strategic alignment: A Nomological network. *Information Systems Research*, 20(2), 159–179. doi:10.1287/isre.1070.0159
- Ragowsky, A., Stern, M., & Adams, D. (2000). Relating benefits from using IS to an organization's operational characteristics: Interpreting results from two countries. *Journal of Management Information Systems*, 16(4), 175–194. doi:10.1080/07421222.2000.11518270
- Ranaweera, C., & Prabhu, J. (2003). The influence of satisfaction, trust and switching barriers on customer retention in a continuous purchasing setting. *International Journal of Service Industry Management*, 14(4), 374–395. doi:10.1108/09564230310489231

- Ryals, L. (2005). Making customer relationship management work: The measurement and profitable management of customer relationships. *Journal of Marketing*, 69(4), 252–261. doi:10.1509/jmkg.2005.69.4.252
- Segars, A. H. (1997). Assessing the unidimensionality of measurement: A paradigm and illustration within the context of information systems research. *Omega*, 25(1), 107–121. doi:10.1016/S0305-0483(96)00051-5
- Sen, A., & Sinha, A. P. (2011). IT alignment strategies for customer relationship management. *Decision Support Systems*, 51(3), 609–619. doi:10.1016/j.dss.2010.12.014
- Sigala, M. (2011). eCRM 2.0 Application and trends: The use and perceptions of Greek tourism firms of social networks and intelligence. *Computers in Human Behavior*, 27(2), 655–661. doi:10.1016/j.chb.2010.03.007
- Stefanou, C. J., Sarmaniotis, C., & Stafyla, A. (2003). CRM and customer-centric knowledge management: An empirical research. *Business Process Management Journal*, 9(5), 617–634. doi:10.1108/14637150310496721
- Tallon, P. P. (2007). A process-oriented perspective on the alignment of information technology and business strategy. *Journal of Management Information Systems*, 24(3), 227–268. doi:10.2753/MIS0742-1222240308
- Venkatraman, N. (1989). The concept of fit in strategy research: Toward verbal and statistical correspondence. *Academy of Management Review*, 14(3), 423–444.
- Ward, J. H. Jr. (1963). Hierarchical grouping to optimize an objective function. *Journal of the American Statistical Association*, 58(301), 236–244. doi:10.1080/01621459.1963.10500845
- Wirtz, B. W., Schilke, O., & Ullrich, S. (2010). Strategic development of business models: Implications of the Web 2.0 for creating value on the internet. *Long Range Planning*, 43(2-3), 272–290. doi:10.1016/j.lrp.2010.01.005
- Woodcock, N., Green, A., & Starkey, M. (2011). Social CRM as a business strategy. *Database Marketing and Customer Strategy Management*, 18(1), 50–64. doi:10.1057/dbm.2011.7

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