

# Applications of Knowledge-Enabled CRM

YiChen Lin

Department of Industrial  
Management, Southern Taiwan  
University of Technology,  
Tainan, Taiwan  
yichen@mail.stut.edu.tw

JrJung Lyu

Department of Industrial  
Management Science,  
National Cheng Kung University,  
Tainan, Taiwan  
jlyu@mail.ncku.edu.tw

ChiuShuang Chan

Department of Industrial  
Management, Southern Taiwan  
University of Technology,  
Tainan, Taiwan  
jtina@pchome.com.tw

## Abstract

Knowledge Management (KM) is the process of managing organizational knowledge from creating business value that will focus on creating and delivering innovative products or services and managing relationships with existing key stakeholders in the context of Customer Relationship Management (CRM). The value of KM and CRM is well recognized by many leading companies. Application of Knowledge-enabled Customer Relationship Management (KCRM) is a great opportunity to increase the customer value and provides a way to systematically attract, acquire and retain the customers. This study has taken a beauty enterprise as an example and focused on its franchise stores to perform a field study. A strategic knowledge-enabled CRM framework is introduced in order to classify the subjects by customer-oriented perspective. From the responses of the surveyed beauty enterprise, it is demonstrated how the companies can develop their customer connection strategies based on their current and future positions in four dimensions of the value compass model. Moreover, this study presented a conceptual model of KCRM to see how KM can help CRM implementation.

**Keywords:** Knowledge Management, Customer Relationship Management, e-Business

## 1. Introduction

Electronic Commerce (EC) has changed the traditional focus of Information Technology (IT) and created a fast-changing business environment. Within such a competitive environment, long-term relationship with customers is one of the most important assets in the companies, which can increase their competitive advantages and improve their profitability substantially. E-businesses focus on their marketing efforts on building lasting relationship with customers through CRM and better understand what customer wants and needs becomes obvious [6]. Conducting business through electronic commerce, the handling of transactions over communications networks, continues to grow in a seemingly unabated fashion. Recently, several leading companies have taken advantage of the CRM power to expand their markets sharply [7]. These companies

establish CRM systems to maintain and further create loyal customers. Unfortunately, most of the companies have limited knowledge about CRM and ignore its importance. It is a common sense that the loss of good opportunity to better serve customers may create great opportunity for the competitors to increase their market share. In response to increasingly competitive environments, companies examine how they can better leverage knowledge assets and create added value. Davenport and Prusak [4] have emphasized that KM addresses the issues of creating, capturing, and transferring knowledge-based resources. Taking the beauty industry as an example, the improvement of the customer relationship for a company in the beauty industry can therefore generate great business opportunity. This study has taken the beauty industry as an example to perform a comparative study between Taiwan and China. A strategic KCRM framework is introduced in order to classify the subjects by customer-oriented perspective. In specific, this paper studies four interrelated objectives in order to get a holistic view of customers and their relationship to the entire enterprise as follows.

1. Provide a framework of KCRM.
2. Conduct a comparative study of KCRM between Taiwan and China franchise stores.
3. Discuss opportunities for Taiwan and China beauty Industry to leverage customer knowledge and to create value for customers based on the findings.
4. Help Taiwan and China beauty industry understand the needs of each other and further find the possibility to develop the new market.
5. See how KM can help CRM implementation.

## 2. Literature review of CRM and KM

Tiwana [11] defined Knowledge-enabled Customer Relationship Management (KCRM) as "Managing customer knowledge to generate value-creating lock-ins and channel knowledge to strengthen relationships and collaborative effectiveness, Knowledge-enabled CRM is more of a business model/strategy than a technology-focused solution." He clearly identified knowledge management and customer relationship management for every business decision-maker and IT professional. The availability of large volume of data on

customers, made possible by new technology tools, has created opportunities as well as challenges for businesses to leverage the data and gain competitive advantage. Shaw et al. [10] have presented a systematic methodology that uses data mining and knowledge management techniques to manage the marketing knowledge and support marketing decisions. Lesser et al. [3] have identified four approaches (customer knowledge development dialogues, facilitating the capture of knowledge relevant data, demonstrating enterprise leadership commitment to customer knowledge) that can expand the availability and use of customer knowledge. Lin [5] presents a systemic integrated communications model that may help enterprises identify the potential issues of CRM. Wayland and Cole [12] have presented the Value Compass model which makes explicit connection between what managers know about their customers and how they can leverage that information to create customer value. Arthur Andersen Business Consulting [1] identified that customer knowledge base is one of the ten high performance of KM. So CRM together with Knowledge Management (KM) could be further studied.

As shown from these researches, directly related to and underlying CRM is the emerging discipline of KM. Although a surge in emphasis and interest on both CRM and KM such as popular press reports, books, conferences, the growing number of CRM and KM systems, vendors, consultants and so on. Massey et al. [9] have explored the leading company IBM's first effort to re-engineering the CRM process by leveraging technology and its knowledge-based resources. Moreover, enabling CRM through KM inside IBM represented a full-fledged business approach to the acquisition, assembly, and application of knowledge to the CRM process.

### 3. Research Model

#### 3.1 Problem background

The beauty enterprise in this study has the most franchise stores in Taiwan and most expert Taiwan-based multinational beauty conglomerate. It manufactures a great variety of products in Taiwan and has markets the superb quality products into the world markets in its own brand for a long time. It has further expanded its service for worldwide counterparts in the UK, France, Italy, Germany, the United States, Uruguay and Argentina. In the integral global structure under the brilliant leadership, this beauty enterprise constantly insists on corporate philosophy of research, education, services and promotion; combining research, production, training, marketing, promotion and service into a whole. Unlike conventional marketing of franchises, it features diverse, international, systematic and standard management to assure integration in education, technologies theories, products, equipment, systems, trademarks, ads, marketing and management and, furthermore, develop the world-admired marketing networks. This beauty

enterprise now has around 600 franchise stores in Taiwan and 2000 franchise stores in China. Knowing their customers better is very important especially through KCRM.

In our conceptual model, we will consider strategic analysis of CRM and further see how KM can help the process of CRM implementation successfully. The conceptual model is displayed in Figure 1.

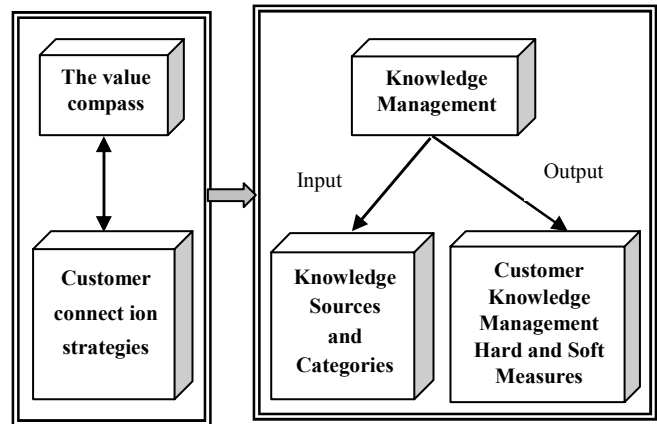


Figure 1 The conceptual model

#### 3.2 Strategic analysis of KCRM

Based on our previous studies [6] [7] [8], Wayland and Cole's [12] value compass model will help to do strategic analysis of CRM. Customer knowledge, customer-connecting technology, and customer economics are the foundations of customer-connected strategy. They make it possible to determine where a business can position itself along each of the four dimensions of the value compass model.

The four dimensions of the value compass model provide ways for business to identify and manage customer relationships, to measure business's contribution to its customer value chain, to decide the position of the company within the industry value-added chain, and to decide, on this basis, which customers and suppliers can create and share better value. A comparative study of KCRM between Taiwan and China franchise stores can evaluate where they are on the value compass model at present and in the future and furthermore get ideas about KCRM strategies.

#### 3.3 How KM can help the process of CRM implementation

Beckman [2] identified 8 steps of KM: knowledge identify 、 knowledge capture 、 knowledge select 、 knowledge store 、 knowledge share 、 knowledge apply 、 knowledge create and knowledge sell. This study took advice from 5 senior managers of the beauty enterprise and select 5 steps: knowledge select 、 knowledge capture 、 knowledge share 、 knowledge create and knowledge store.

Tiwana [11] provided knowledge source and categories such as markets, competitions, customers, orders, contracts, products and services, problems and best practices. Basically, knowledge about these sources and categories must be integrated into a knowledge-enabled CRM strategy. In general, that what can be measured is not always important, and what is important cannot always be measured. The example of hard and soft measures from Tiwana [11] can serve the indicators of the business impact of customer knowledge management (As shown in Table 1). Our concept is to identify how important the knowledge sources and categories and customer knowledge management hard and soft measures are. Moreover, how KM is so important and can further help the process of CRM implementation.

**Table 1 Hard and soft measures [11]**

Hard	Soft
Cost savings	Customer satisfaction
Customer retention	Customer loyalty
Repeat purchases	Customer and employee productivity
Market share	Employee loyalty
Customer acquisition rate	Employee empowerment
Cost of sales/expense reduction	Defection likelihood
Stock valuation	Market leadership
Bottom-line effects	Organizational stability
Profit margins	Cultural change

### 3.4 Hypothesis development

The hypothesis development is identified as follows and will be explained later.

- H<sub>1</sub>: There is significant different between current and future position of the value compass model in Taiwan.
- H<sub>2</sub>: There is significant different between current and future position of the value compass model in China.
- H<sub>3</sub>: There is significant difference between Taiwan and China in the KM dimension.
- H<sub>4</sub>: There is significant difference between Taiwan and China in the customer resources and categories dimension.
- H<sub>5</sub>: There is significant difference between Taiwan and China in customer knowledge management hard and soft measures dimension.

## 4. Research method and design

This study proceeded in three phases. First, a qualitative approach that included a literature review was

employed. The purpose of this phase was to get basic knowledge about the topic. Secondly, a quantitative approach that included the development of a questionnaire was conducted. Lastly, the deep case study was conducted to validate the research findings, to assist in the interpretation of the results and to see how KM can help CRM implementation. We aimed to ascertain:

- (1) Where are the current and future marketing strategies for the franchise stores of the beauty enterprise in Taiwan and China on the value compass model ?
- (2) How do these franchise stores consider about their customer connection strategies ?
- (3) How KM can help CRM implementation successfully for the beauty enterprise ?

Phase three of this research involved a further case study stage. The purpose of this phase was to discuss the research findings with interviewees of the beauty enterprise in order to explain and validate the findings of the questionnaire.

## 5. Research findings

This field study focused on the selected beauty enterprise and the questionnaires were sent to 35 franchise stores in Taiwan and 70 franchise stores in China. The questionnaires were sent by its headquarter and all returned. There were 30 available responses from 35 franchise stores in Taiwan and 66 available responses from 70 franchise stores in China. An analysis of scale reliability was performed using Cronbach's alpha coefficient. The final scale reliabilities were 69.18% for knowledge management (5 items), 79.69% for knowledge sources and categories (8 items), and 84.68% for customer knowledge management hard and soft measures (2 item).

### 5.1 Strategic analysis of KCRM

The strategic analysis of KCRM will be separated into two parts.

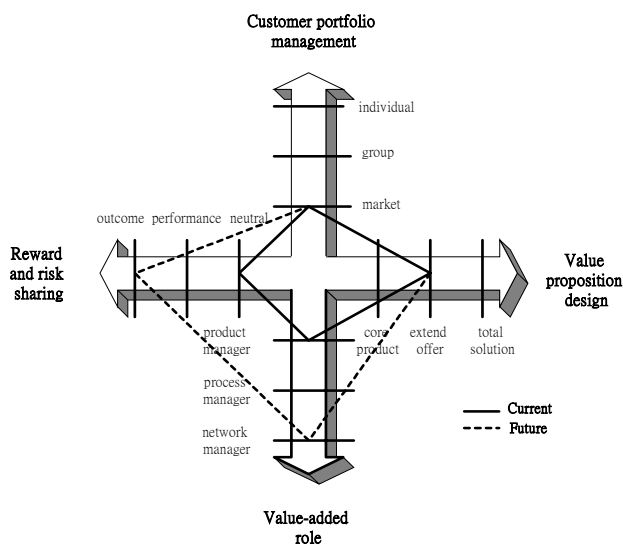
#### (1) The value compass

The current and future position for the subject on the value compass in Taiwan and China are shown below in Table 2. As shown below in Figure 2, the franchise stores in Taiwan current stay on market, extended offer, product manager and neutral and will more to market, extended offer, network manager and outcome levels. In the Figure 3, the franchise stores in China current stay on market, extended offer, process manager and performance levels and will stay on market, extended offer, network manager and outcome levels in the future. Clearly, although there is difference between Taiwan and China currently, they have the same future view on the value compass model. According to H<sub>1</sub> and H<sub>2</sub> as mentioned before, Table 3 indicates the results as follows. It seems that there is no significant

difference between current and future position in all dimensions of the value compass model in Taiwan. However, there is significant difference between current and future position in value proposition design, value-added role, and reward and risk sharing dimensions of the value compass model in China. Not surprising, China economics is growing like flying. The people in China expect a lot of progress in the future. So these three dimensions have to be urgently considered to change.

**Table 2 The current and future positions on the value compass in Taiwan and China**

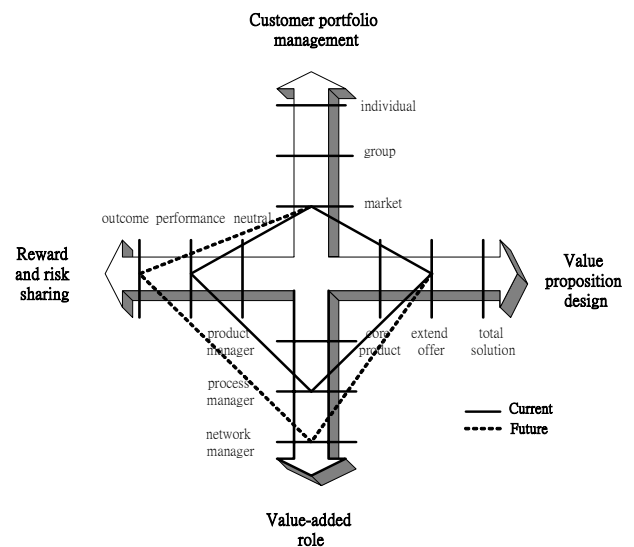
Dimension		Taiwan		China	
		Current	Future	Current	Future
Customer portfolio management	Market	17	21	41	42
	Group	7	8	21	20
	Individual	6	1	4	4
Value proposition design	Core product	4	2	14	20
	Extend offer	13	15	37	29
	Total solution	13	13	15	17
Value-added role	Product manager	18	9	23	20
	Process manager	7	9	30	19
	Network manager	5	12	13	27
Reward and risk sharing	Neutral	15	10	20	20
	Performance	10	9	31	20
	Outcome	5	11	15	26



**Figure 2 The value compass in Taiwan**

**Table 3 The significant difference between current and future position in Taiwan and China on the value compass model**

Dimension	Taiwan			China		
	$\chi^2$	P-Values	Significant difference	$\chi^2$	P-Values	Significant difference
1.Customer portfolio management	5.835	0.212	No	6.137	0.189	No
2.Value proposition design	8.380	0.079	No	24.041	0.000	Yes
3.Value-added role	6.649	0.156	No	38.657	0.000	Yes
4.Reward and risk sharing	4.186	0.381	No	28.229	0.000	Yes



**Figure 3 The value compass in China**

After doing deep interviews, there were some suggestions coming out in the following.

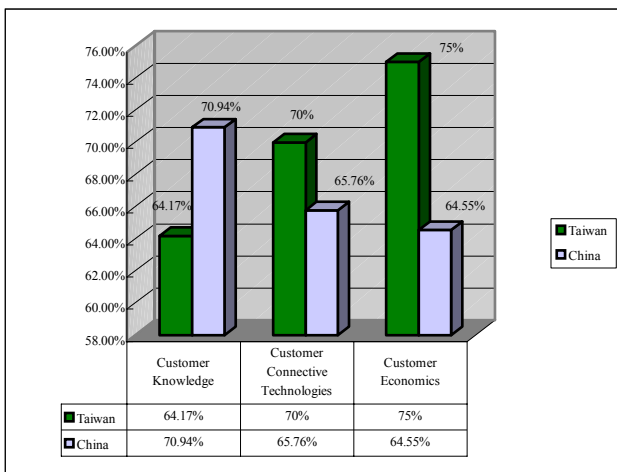
- (A) Build it and they will come strategy:  
Adding franchise stores to expand market share and targeting the right market with the right product and image.
- (B) Appreciate the customer's value criteria and decision-making process strategy:  
Collaborative marketing with the famous brand in European to get into China market.
- (C) Add value for both buyers and sellers by providing a form of connection more efficient than either could achieve by operating independently:  
Using Application Service Provider (ASP) model to help franchise stores get significant information, search, or transaction costs.

(D) A mutual investment by both the buyer and seller strategy:

Expanding in Taiwan and China toward SPA new image stores, with encouragement of franchised beautification stores into franchised SPA chains.

## (2) Customer connection strategies

In Figure 4, a comparison of how the franchise stores in Taiwan and China consider about their customer connection strategies is shown. Based on the surveyed data, the franchise stores in Taiwan have done the connection for customer knowledge in 64.17%, for customer connective technologies in 70% and for customer economics in 75%. On the contrary, the franchise stores in China have done the connections for customer knowledge in 70.94%, for customer – connection technologies in 65.76% and for customer economics in 64.55%. Interestingly, the franchise stores in Taiwan are doing better for customer connective technologies and customer economics. The franchise stores in China are doing better for customer knowledge. There will be something they can learn from each other and totally make profit for the beauty enterprise.



**Figure 4 Customer connection strategies in Taiwan and China**

## 5.2 Process analysis of KCRM

According to  $H_3$ ,  $H_4$ ,  $H_5$ , Table 4 has shown responses about the process analysis of KCRM in Taiwan and China. So there is significant difference between Taiwan and China in the KM dimension expect knowledge store. It is important for the franchise stores to focus on knowledge create and share in Taiwan and knowledge store and capture in China.

According to Table 4, there is significant difference between Taiwan and China in the customer resources and categories dimension. It is really needed to take care of sharing knowledge sources and categories. Eventually,

the respondents of the franchise stores in Taiwan want to get more knowledge about best practices and problems. The respondents of the franchise stores in China want to get more knowledge about products and services and markets.

According to Table 4, there is significant difference between Taiwan and China in customer knowledge management hard and soft measures dimension. As shown in Table 5, the respondents of the franchise stores in Taiwan believe that well customer knowledge management is good for repeat purchases, customer retention and market share in the hard measures. The respondents of the franchise stores in China believe that well customer knowledge management is good for market share and repeat purchases in the hard measures. About the soft measures, the respondents of the franchise stores in Taiwan believe that well customer knowledge management is good for customer satisfaction, customer loyalty, customer and employee productive and organizational change. The respondents of the franchise stores in China believe that well customer knowledge management is good for customer loyalty and employee loyalty.

## 6. Conclusion

This research presents application of Knowledge-enabled Customer Relationship Management and takes a beauty enterprise as an example. This paper can be summarized in the following.

- (A) There is significant difference between current and future position in value proposition design, value-added role, and reward and risk sharing dimensions of the value compass model in China.
- (B) In this case study, the franchise stores in Taiwan are doing better for customer connective technologies and customer economics. The franchise stores in China are doing better for customer knowledge. There will be something they can learn from each other and totally make profit for the beauty enterprise.
- (C) Developing the process of KCRM, it is important for the franchise stores to focus on knowledge create and share in Taiwan and knowledge store and capture in China.
- (D) The respondents of the franchise stores in Taiwan want to get more knowledge about best practices and problems. The respondents of the franchise stores in China want to get more knowledge about products and services and markets.
- (E) Well customer knowledge management is good for repeat purchases, customer retention, market share, customer satisfaction, customer loyalty, customer and employee productive, organizational change and employee loyalty.
- (F) KM can enable CRM and help the CRM implementation.

Dimension		Mean <sub>Taiwan</sub>	Mean <sub>China</sub>	t-Values	P-Values	Significant difference
Knowledge Management	Knowledge Select	3.68	3.23	2.854	0.005	Yes
	Knowledge Capture	3.73	3.32	3.210	0.002	Yes
	Knowledge Share	3.76	3.25	2.981	0.004	Yes
	Knowledge Create	3.89	3.29	4.094	0.000	Yes
	Knowledge Store	3.55	3.39	2.239	0.220	No
Knowledge Sources and Categories	Markets	4.00	3.31	5.422	0.000	Yes
	Competitors	3.48	2.74	4.714	0.000	Yes
	Customers	4.03	3.30	5.342	0.000	Yes
	Orders	3.86	3.14	5.328	0.000	Yes
	Contracts	3.90	3.19	4.638	0.000	Yes
	Products and Services	4.03	3.44	3.838	0.000	Yes
	Problems	4.08	3.23	5.538	0.000	Yes
	Best practices	4.11	3.25	5.975	0.000	Yes
Customer Knowledge Management Hard and Soft Measures	Hard Measures	3.80	3.24	4.867	0.000	Yes
	Soft Measures	4.05	3.49	4.779	0.000	Yes

**Table 4 Process analysis of KCRM in Taiwan and China**

**Table 5 Customer knowledge management hard and soft measures**

Hard Measures	Mean <sub>Taiwan</sub>	Mean <sub>China</sub>	Soft Measures	Mean <sub>Taiwan</sub>	Mean <sub>China</sub>
Cost savings	3.77	3.23	Customer satisfaction	*4.13	3.59
Customer retention	*4.10	3.39	Customer loyalty	*4.13	*3.68
Repeat purchases	*4.17	*3.42	Customer and employee productivity	*4.13	3.62
Market share	*4.10	*3.55	Employee loyalty	4.07	*3.64
Customer acquisition rate	3.33	2.32	Employee empowerment	3.97	3.44
Cost of sales/expense reduction	3.70	3.35	Defection likelihood	3.83	3.33
Stock valuation	3.80	3.30	Market leadership	4.10	3.48
Bottom-line effects	3.37	3.09	Organizational stability	*4.13	3.32
Profit margins	3.90	3.52	Cultural change	3.97	3.30

## Reference

- [1] ARTHUR ANDERSEN BUSINESS CONSULTING (1999) Knowledge Management: Jissen No Tame No Best Practice (Tokyo, Toyo Keizai).
- [2] BECKMAN, T. (1997) A Methodology for Knowledge Management, Proceeding of the TASTED International Conference on AI and Soft Computing.
- [3] LESSER, E., MUNDEL, D. & WIECHA, C. (2000) Managing customer knowledge, **Journal of Business Strategy**, November/December, pp. 35-37.
- [4] DAVENPORT, T. H. & PRUSAK, L. (1999) Working Knowledge –How Organization Manage What They Know (Boston: Harvard Business School Press).
- [5] LIN, Y. (2000/2001) Assessing the applicability of integrated communications- a systemic view, **Journal of Integrated Communications**, pp. 46-51.
- [6] LYU, J. & LIN, Y.C. (2001a) A strategic application of customer relationship management, **Quality Control Journal**, March, pp. 21-24.
- [7] LYU, J. & LIN, Y. (2001b) Applications of CRM on SMEs- A Field Study on the Steel Industry (Chinese Taipei, Hsinchu, APEC Small and Medium Enterprise E-Commerce Symposium), pp.157-170.
- [8] LIN, Y., SHU, C., HSIEH, H.H. & SHIH, W. (2001) A Field Study of CRM and Hotel Enterprises, The First International Conference on Electronic Business, Hong Kong, P.273-274.
- [9] MASSEY, A.P., MONTOYA-WEISS, M.M., & HOLCOM, K. (2001) Re-engineering the customer relationship: leveraging knowledge assets at IBM, **Decision Support Systems**, 32, pp.155-170.
- [10] SHAW, M.J., SUBRAMANIAM, C., TAN, G.W. & WELGE, M.E. (2001) Knowledge management and data mining for marketing, **Decision Support Systems**, 31, pp.127-137.
- [11] TIWANA, A. (2000) The Essential Guide to Knowledge Management, E-Business and CRM Applications (Upper Saddle River, Prentice-Hall).
- [12] WAYLAND, R.E. & COLE, P.M. (1997) Customer Connections: New Strategies for Growth (Boston, Harvard Business School Press).