CRM and customer-centric knowledge management: an empirical research

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Abstract *Current competitive challenges induced by globalization and advances in information technology have forced companies to focus on managing customer relationships, and in particular customer satisfaction, in order to efficiently maximize revenues. This paper reports exploratory research based on a mail survey addressed to the largest 1,000 Greek organizations. The objectives of the research were: to investigate the extent of the usage of customer- and market-related knowledge management (KM) instruments and customer relationship management (CRM) systems by Greek organizations and their relationship with demographic and organizational variables; to investigate whether enterprises systematically carry out customer satisfaction and complaining behavior research; and to examine the impact of the type of the information system used and managers' attitudes towards customer KM practices. In addition, a conceptual model of CRM development stages is proposed. The findings of the survey show that about half of the organizations of the sample do not adopt any CRM philosophy. The remaining organizations employ instruments to conduct customer satisfaction and other customer-related research. However, according to the proposed model, they are positioned in the first, the preliminary CRM development stage. The findings also suggest that managers hold positive attitudes towards CRM and that there is no significant relationship between the type of the transactional information system used and the extent to which customer satisfaction research is performed by the organizations. The paper concludes by discussing the survey findings and proposing future research.*

Introduction

Leading firms, after gradually adopting the production, sales and marketing philosophies, are now faced with the challenges of a new orientation that might be termed a customer-centric one (Bose, 2002). At the core of this orientation there exists the necessity for developing and establishing long-term relationships with customers aimed at improving customer service and satisfaction. The interest for the vendors-customers relationships, termed "relationship marketing", has evolved from the concept that there is a continuum of customer relationships, ranging from transactional to relational orientations. Through this relational orientation a company seeks to create overall or cumulative customer satisfaction as opposed to transaction-specific customer satisfaction (Garbarino and Johnson, 1999). Customer satisfaction

and the level of customer service are particularly regarded significant in building trustworthy relationships with customers and retaining the competitive advantage. Sophisticated organizations worldwide rely on specialized CRM software systems to accumulate and analyze customer-focused information.

Company relationships with customers can be greatly improved by employing information technology (IT) (Karimi *et al.*, 2001). IT can facilitate and enhance customer relationships in various ways, but mainly enables companies to attain customization, the essence of the customer-centric orientation, through the deployment of sophisticated customer relationship management (CRM) systems (Dewhurst *et al.*, 1999). According to Oracle, CRM "is about knowing your customers better and effectively using that knowledge to own their total experience with your business, and to drive revenue growth and profitability". CRM can also be defined as the management approach that involves identifying, attracting, developing and maintaining successful customer relationships over time in order to increase retention of profitable customers (Bradshaw and Brash, 2001; Massey *et al.*, 2001).

Companies have come to realize that in order to develop successful, long-term, relationships with customers they should focus on the "economically valuable" customers, while keeping away and eliminating the "economically invaluable" ones (Romano, 2000; Verhoef and Donkers, 2001). Thus, instead of treating all customers equally, companies are now realizing that it is more effective to develop customer-specific strategies. CRM enables firms to deploy such strategies by managing individual customer relationships with the support of customer databases and interactive, as well as, mass customization technologies (Verhoef and Donkers, 2001). CRM, as explained in the relevant section below, is definitely related to the discipline of knowledge management (Romano, 2000; Massey *et al.*, 2001). Thus, the existence of sufficient and continually updated customer knowledge is critical for an effective CRM system.

The objectives of the research reported in this paper were: to propose a conceptual model of CRM development stages; to investigate the extent of the usage of KM customer-related instruments and CRM information systems by Greek organizations and their relationship with organizational and demographic variables; to investigate whether companies systematically conduct customer satisfaction and complaining behavior research; and to examine the impact of the type of the information system used on CRM related practices. The paper is structured as follows: First, there is a discussion about relationship marketing, customer satisfaction and complaining, where the customer satisfaction concept is stressed. Next, CRM and its relation with KM and information systems is examined. Then, the proposed CRM model is presented and analyzed. The methodology section with survey results and analysis follow. Finally, conclusions and implications are presented.

Relationship marketing, customer satisfaction and complaining

Relationship marketing aims at building long-term, mutually satisfying relations with customers, suppliers and distributors with the objective to earn and retain their long-term preference and businesses (Kotler, 2000, p. 13). According to relationship marketing theories, social and structural bonds between businesses and customers can be developed and leveraged with the objective of mutually beneficial economic exchanges (Frenzen and Davis, 1990; Massey *et al.*, 2001). A basic theoretical approach guiding relationship marketing research stems from social psychology. More specifically, the social exchange theory and the theories of power and dependence emphasize processes that lead to satisfaction for the exchange parties as well as techniques for managing dependence and uncertainty (Cannon and Perreault, 1999). Empirical findings suggest that customer satisfaction, which is the underlying notion of relationship marketing, is a critical point in achieving and retaining competitive advantage. Organizations have discovered and research studies have shown that retaining current customers is much less expensive than attempting to attract new ones (Desatnick, 1988; Stone *et al.*, 1996; Bitran and Mondschein, 1997; Chattopadhyay, 2001; Massey *et al.*, 2001). The best means to accomplish customer retention is to keep customers satisfied. In fact, a number of studies have shown that customer satisfaction can lead to brand loyalty, repurchase intention and repeat sales (Day, 1984; Swan and Oliver, 1989; Oliver, 1999; Parasuraman and Grewal, 2000), in short to customer retention. Customer retention, in its turn, seems to be related to profitability (Oliver, 1999).

Customer satisfaction has been related to perceived performance and expectations. If performance matches expectations or exceeds them, the customer is satisfied or highly satisfied respectively. If performance falls short of expectations, the customer is dissatisfied (Olshavsky and Miller, 1972; Anderson, 1973; Hunt, 1977). Moreover, customer satisfaction is at the core of the marketing concept, which has been the guiding force for most of the leading companies (McCarthy and Perreault, 1987; Webster, 1988; Kotler, 1991, 2000).

Traditionally, emphasis has been given in obtaining additional customers and encouraging brand switching from competitors, that is, in offensive strategies (Fornell and Wernerfelt, 1987). Customer satisfaction and retaining has been labeled as defensive strategy. The goal of defensive strategy is the minimization of customer turnover (maximization of customer retention) through the protection of products and markets from competitive brands and generally from competitive inroads (Fornell, 1992). Practically, most firms adopt a combination of offensive and defensive strategies. But in the face of increasing competition and maturing and shrinking markets, defensive marketing is becoming more attractive and popular. Obviously, this trend is magnified by the rapid development of CRM systems and the adoption of the customer-centric orientation.

This paper also addresses the issue of customer complaining, which has been ignored in the CRM literature. Customer complaining is strongly related to the notion of customer dissatisfaction. It refers to behavioral and non-behavioral consequences following customer dissatisfaction with a product or service. Traditionally, the behavioral consequences have been the focus of complaint behavior studies and involve some kind of expression of the dissatisfaction experience. That is, brand switching, negative word-of-mouth, redress seeking, complaining to the firm or to a third party, among others. Understanding complaining behavior is an important area of inquiry. It has been recognized that the study of complaining behavior has implications for such critical phenomena as brand loyalty and repurchase intentions (LaBarbera and Mazursky, 1983; Day, 1984; Blodgett *et al.*, 1993; Davidow and Leigh, 1998) and market feedback mechanisms (Fornell and Wernerfelt, 1987). From all the dissatisfaction consequences, the most desirable one for the company should be customer complaining to it. It has been shown, that maximizing the number of complaints from dissatisfied customers (subject to certain cost constraints) is in the best interest of the firm (Fornell and Wernerfelt, 1987). In such a way, where applicable, a market feedback mechanism is activated enabling the company to pin-point the problems related to product quality, pricing, communication with customers and other aspects of the marketing mix (Bearden and Teel, 1980; East, 1996). Therefore, the system should encourage customers to complain, aiming at providing a better feedback to the company. Complaint management is thus, an important marketing variable and a key element in relationship marketing and CRM by extension. Consequently, in applying a CRM system within the firm, the customer data profile needs to be expanded in order to include non-transactional data, such as general enquiries, suggestions and complaints (Bose, 2002).

CRM and customer knowledge management

According to the definition of CRM presented in the introduction, obtaining customer-related knowledge is specified as the means to attain CRM objectives. Knowledge has been recognized as one of the main assets of organizations (Drucker, 1993). KM, in particular, has been defined as the process of capturing the collective expertise and intelligence in an organization and using them to foster innovation through continued organizational learning (Nonaka, 1991; Quinn *et al.*, 1996). Since a major part of that expertise and intelligence refers to customers, it is concluded that CRM is strongly related to KM and especially to customer KM (Romano, 2000; Massey *et al.*, 2001). According to Romano (2000) companies should explore and refine CRM knowledge management methods in order to get value-added knowledge for themselves and their customers and understanding not only customer purchasing patterns and trends but attitudes and preferences as well. Customer-related knowledge, level of customer service

and customer satisfaction are especially regarded significant in retaining the competitive advantage of the firm (Porter, 1985; Kim and Kim, 2001).

The significance of customer knowledge is emphasized by a number of studies on KM. For example, Skyrme and Amidon, in a 1997 survey of KM practices of European and North American companies, found that 96 percent of them evaluated customer knowledge as the most important asset in maintaining competitiveness (quoted in Bennet and Gabriel, 1999). Similarly, in another survey conducted by the *Journal of Knowledge Management*, with the assistance of the Best Practice Club and the Benchmarking Exchange, in a sample of companies engaged in KM philosophy and practices, was found that customer-focused knowledge was the most preferred type of KM activity (Chase, 1997).

In order to acquire and monitor customer knowledge, a number of practices, instruments and measures have been suggested in the KM literature. Beijerse (1999) proposes the following:

- assess customers;
- carry out customer satisfaction research;
- obtain knowledge from customers; and
- interview customers.

Customer satisfaction, in particular, as an instrument to enhance customer knowledge, is also suggested by other authors in the literature (Ahmed *et al.*, 1999; Meso and Smith, 2000; King and Ko, 2001). Apart from the adopted methods, practices and instruments, the perceived importance of the customer factor is also indicated by the company's culture as expressed by its attitudes towards customers and the relationships shaped between the company and them. These attitudes, structuring, under certain conditions, behavior and actions (Ajzen and Fishbein, 1980; Antonides and Raaij, 1998, p. 202) are also examined in the present study.

At this point, it is interesting to note, that, as has been argued, knowledge, unlike data or information, is embedded in people and not in IT (Sveiby, 1997, 2000; Davenport and Prusak, 1998). The way people capture, share and interpret knowledge accumulated in organizational repositories is very important in operational and strategic business activities and actions aiming at retaining competitive advantage. It has also been suggested that a biased view of the value of knowledge-based systems (KBS) exists in the literature putting an excessive emphasis on IT (Hendricks and Vriens, 1999). However, IT enables decisively the implementation of modern KBS by providing data mining and decision support tools and integrating communications technologies (McCampbell *et al.*, 1999). Additional technological advances supporting both KM and CRM systems include groupware systems, dataware houses, information retrieval engines, workflow systems and Web-based technologies.

CRM in information systems

Advances in IT and information systems have been a catalyst for the development of CRM systems. According to Bose (2002):

> ... in IT terms, CRM is an enterprise-wide integration of technologies working together, such as data warehouse, Web site, intranet/extranet, phone support system, accounting, sales, marketing and production.

CRM has certainly been transformed and become more sophisticated with the development of e-commerce. The two areas seem to follow a common route into the future.

From the definitions about CRM, cited in the introduction of this paper, one could conclude that no management process technology is necessary. However, practically, there are two basic ways a CRM system can be employed and interact with a customer: first, an IT-assisted CRM, emphasizing traditional channels, such as telephone support centers, communication by fax and/or mail as well as field personnel (Wells *et al.*, 1999; Bradshaw and Brash, 2001); second, an IT-automated CRM, emphasizing customer interaction through technologies such as the Web, wireless devices and automated phone systems (Wells *et al.*, 1999; Bradshaw and Brash, 2001; Bose, 2002). The system enables customers to interact directly with CRM (Bose, 2002).

CRM might be a major part of a firm's e-commerce strategy (Karimi *et al.*, 2001). The Web presence, in particular, should engage each individual customer ensuring his/her returning again and again. The company should integrate the Internet with the front-office company functions, i.e. marketing, sales and service, so that it will be able to have and provide a good customer experience. Integration with back-office applications is also essential and it is not surprising that CRM applications are rapidly becoming more multifunctional and integrated with other existing software such as enterprise resource planning (ERP) systems (Karimi *et al.*, 2001). Although traditional ERP is generally regarded as a transactional back-office system offering limited decision making support (Stefanou, 2001), recently developed ERP functionalities and bolt-on applications, such as supply chain management (SCM) and CRM aspire to give extended ERP knowledge management capabilities for capturing, analyzing and sharing market and customer data and creating value for the customers. This integration may lead to a Web-based decision support system (DSS) providing online analytical capabilities and serving effectively both customers and organizations.

However, despite the enthusiasm for CRM as front-office integration, the adoption of second generation CRM systems in large North American and European companies is just emerging according to an industry study by the IDC and Cap Gemini consulting and research firms in 1999 (cited in Massey *et al.*, 2001). This survey found that only 12 percent of the companies have operational CRM systems, most of them focusing mainly on call centers. The situation is expected to be worse in a country like Greece, where, according to a

research survey, only 67 percent of the large enterprises have Web presence and e-commerce plays a minor role in their business activities (Doukidis *et al.*, 2000).

A conceptual model of CRM development stages

CRM, as an emerging discipline, is in great need of theoretical assistance (Gummesson, 2002). Guiding theories and models are in short supply in the field, probably due to the fact that it is a new area for research and because of its relatively recent interchange with IT and information systems, which have been rapidly developing.

It is obvious from the discussion in the preceding sections and the definitions presented in the introduction, that CRM can be defined without any reference to IT or the particular information system implemented in the organization. However, effective customer personalization management requires that CRM software systems should not only be operational but also highly integrated into the IT architecture of the organization. Figure 1 depicts a conceptual model of the CRM development stages. The stages are determined by the level of IT employed and the sophistication/integration of the information system used in the organization. The higher the level of IT the higher the integration of CRM into the organization's IT/IS architecture and more effective/efficient is the management of customer relationships leading to customers' expanded profiles and personalization.
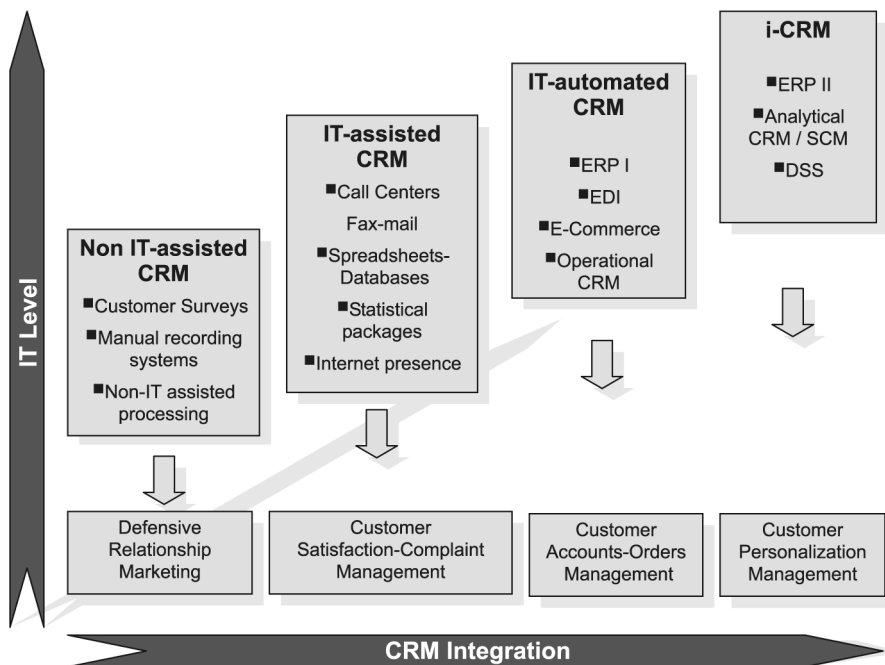
Figure 1.
Stages of CRM
development

The first CRM development stage is the preliminary, non IT-assisted stage. Organizations belonging to this stage have a very limited or not at all use of IT as far as the management of customer relationships is concerned. However, these organizations use customer related knowledge management instruments and have some type of a mostly manual customer satisfaction and/ or complaining data recording/processing system, indicating, thus, their positive attitude and orientation towards defensive relationship marketing.

The second CRM development stage is the IT-assisted CRM, predominately a manual process that uses IT to enhance the company-customer relationship (Wells *et al.*, 1999) and analyze customer-related data. This came to prominence around 1998 and emphasized on traditional channels mentioned above. Customer data are mainly collected manually but recorded and analyzed by using spreadsheets, database systems and statistical packages. Organizations belonging to this stage are expected today to have some Internet presence and manage effectively and efficiently customer satisfaction and complaint behavior.

The third CRM development stage is the IT-automated CRM, which emphasizes customer interaction by using a number of technologies, such as the Internet and telephone/computer integration. Acquisition of customer profiles, tracking of customer purchase patterns and trends and interactive service provision have been made possible by the advances in IT (Chattopadhyay, 2001). Companies belonging to this stage have active Web presence, use EDI systems, engage in e-commerce and have implemented ERP and operational CRM systems aimed at business processes optimization and sales force automation. Processing of customer requests and orders and management of customer accounts are expected to be timely and accurate and generally at a high level of efficiency.

The fourth CRM development stage is the integrated CRM (i-CRM), leading to customer personalization and high level of service and customer satisfaction. At this stage, companies employ sophisticated CRM information systems providing highly integrated back-office, front-office and Internet functions. These integrated CRM software systems should be flexible enough to adapt to changing customer needs over the product's life cycle (Chattopadhyay, 2001) and analytical in order to dynamically monitor consumer preferences. Personalization software includes a number of analysis technologies such as data mining, collaborative filtering and rules engines (Bradshaw and Brash, 2001). Supply chain optimization and analytic functions are also expected at this stage through the use of Web-enabled decision support software systems. This will probably require not only enterprise-wide sharing of information so that customer-centric knowledge could be available to every decision maker inside the organization but also sharing of relevant business information with customers and business partners aiming at overall customer satisfaction, processes efficiency and cost minimization (Stefanou, 2001).

Research methodology

This study is based on a mail survey of the largest Greek organizations. The questionnaire was addressed to marketing and sales managers because it included a large number of marketing variables and it was thought that these managers should also be familiar with the information system of their organizations. Due to the exploratory nature of this research, the questionnaire included items concerning costumer-oriented knowledge gathering instruments, customer satisfaction/complaining data recording/processing systems, managers' attitudes towards CRM and the type of information system employed. The survey was constructed by following standard guidelines for the design of research surveys proposed by Dillman (1978).

The questionnaires, accompanied with a pre-paid self-addressed envelope and a cover letter explaining the purpose of the research, the voluntary nature of the participation and assuring participants of confidentiality, were mailed to the marketing/sales managers of the 1,000 largest, based on revenue, organizations in Greece. The questionnaires were mailed from and returned to a campus address. The list of organizations was compiled by using the ICAP (Index of Companies and Products) directory, a widely accepted database containing information about Greek companies. A second letter, including a questionnaire form, was sent three weeks later, thanking those who answered the questionnaire and reminding those who did not, to return it by a specified date.

The letters were addressed to each individual personally and not just to the "marketing or sales manager". This was achieved by using the information contained in the ICAP database. A total of 1,000 questionnaires were mailed and 92 were initially returned. After the follow-up another 77 were received making a total of 169. The rate of response was 16.9 percent. Seven of the questionnaires were unusable, therefore a total of 162 usable questionnaires were used in the analysis of data.

Measures

The questionnaire incorporated a list of customer-related instruments based on a previous study (Beijerse, 1999) presented below. All of the items were measured by a Likert-type scale (1 = never, 5 = always). A number of questions regarding the customer satisfaction/complaint recording system used in the company, the customer data collection method employed and the technology used to analyze customer data were also part of the questionnaire. A section with questions concerning managers' attitudes towards CRM was included. The questions of this section were compiled by the authors after an extensive search of the literature and discussion with colleagues and are presented below. These items were also measured by Likert-type scales (1 = not important, 5 = very important). In addition, the questionnaire included questions regarding the particular information system used (ERP

package, non-ERP package, custom made/in-house development) and whether additional specialized CRM and SCM systems were used. Demographic variables, such as age and education of the respondents and organizational variables such as the type of industry and the size of the marketing department were also included.

Data analysis and discussion

A variety of industries is represented in the sample (Table I). The age of the majority of the respondents was between 35-44 years, 24.8 percent of them were female. As far as their education level is concerned, 46.9 percent of them had a University degree, 39.5 percent a postgraduate degree and 6.8 percent a college degree

Table II depicts the frequencies concerning the use of customer-oriented KM instruments in Greek organizations.

Overall, the findings show that more than half of the Greek organizations always, or frequently use, instruments to evaluate external environment and to assess and obtain knowledge from customers. However, only about one-quarter of them systematically carry out market research. This suggests that there is enough room to increase performance in case there was an improvement in this particular aspect. It is also worth mentioning that 44 percent of the respondents carry out customer satisfaction research. An additional similar question, asking whether there was a customer satisfaction recording system in the organization was included in the questionnaire. The percentage of those who answered "yes" was about the same, 41.5 percent. By performing the chi-square

Main activity of organization	Percent
Finance/banking/insurance	2.5
Retail	6.2
Wholesale/distribution	27.6
Food processing	6.8
Chemical processing	4.9
Textiles	3.7
Other	9.1

Table I.
Sample characteristics

Instruments used to:	Never/sometimes (%)	Frequently/always (%)
Assess customers	16.6	54.7
Carry out customer satisfaction research	37.8	44.0
Carry out market research	47.1	26.7
Obtain knowledge from customers	17.5	51.3
Evaluation of external environment and markets	15.6	51.3

Table II.
Customer oriented instruments

test and the ANOVA procedure among this variable and the Table II customer satisfaction and market research instruments, there was an indication of convergent validity of those variables.

Table III depicts the percentages of the organizations that use any type of a customer satisfaction and complaint recording system; 41.5 percent of them use questionnaires, e-mails, call centers and periodic market research and customer surveys in order to collect customer satisfaction data; 61.7 percent of them collect customer complaint data. It is concluded, therefore, that about half the organizations do not usually employ any customer KM methods and have not adopted any CRM philosophy.

Table IV depicts the type of the system used to collect the data and Table V the technology employed to analyze these data and transform them into meaningful information.

Table VI depicts the type of the main information system implemented by the organizations which responded to the survey.

	Percent		
	Yes	No	
Customer satisfaction recording system	41.5	58.5	
Customer complaining recording system	61.7	38.3	

Table III.
Customer satisfaction/ complaining recording system

	Percent		
	Internet	Non-Web-based market research	
Customer satisfaction data collecting system	1.7	98.3	
Customer complaining data collecting system	13.3	76.7	

Table IV.
Customer data collection method

	Percent		
	MS Excell-Access	Statistical package	Outsourced to third party
Customer satisfaction	72.0	24.0	4.0
Customer complaints	93.3	6.7	0.0

Table V.
Technology used to analyze customer data

	Percent
ERP	53.4
Packaged applications (non-ERP)	21.9
Custom made/in-house development	24.7

Table VI.
Type of information system implemented

As shown in Table VI, 53.4 percent of the respondents have implemented ERP systems. The ERP average age, after implementation, is 23.95 months. The ERP percentage in Table II includes ERP software developed by both the big multinationals ERP vendors, mainly SAP, (17.8 percent) and local Greek software firms (35.6 percent). However, it should be noted that nearly half of the respondents failed to answer the above question, as probably they did not know the type of their information system. Without taking this fact into account, the actual percentage of those who answered that they use an ERP system is 24.1. Also, it is interesting to note that 10.3 percent of the respondents use additional specialized CRM software (such as Siebel's) and 6.4 percent use specialized supply chain management (SCM) software (such as Manugistics). In more than half the cases, the CRM and SCM software is integrated with the ERP system. However, only 1.85 percent uses integrated ERP/SCM/CRM systems. The average operation period of the CRM and SCM systems is 14.5 months, which shows that CRM/SCM systems have only very recently entered the market. In any case, the penetration of specialized CRM and SCM packages is rather small considering the fact that the survey was addressed to the largest Greek companies. These findings suggest that there is a potential large market for vendors of CRM software systems to enter.

By using the above information and taking into account the conceptual framework of CRM development stages presented previously, it is concluded that nearly half of the largest Greek enterprises exhibit technological indicators characteristic of the first two stages of CRM maturity adopting a philosophy of defensive relationship marketing or practicing customer satisfaction/complaint management. Only a very small percentage of them (1.85 percent), that is, those that use integrated CRM and SCM software systems, can be assumed to belong to the more mature stage of CRM development. It is reminded however, that, relatively, the situation is not much better with the large North American and European companies, according to the IDC/Cap Gemini study mentioned earlier.

Next, managers' attitudes towards CRM are presented. As noted in the theoretical part of the paper, the perceived importance of the customer factor can also be indicated by the managers' attitudes towards customers and company-customer relationships. Table VII depicts the frequencies of 12 questions measuring the importance attributed to customer-oriented and marketing-related issues by the respondents.

As was expected, customer-related issues are regarded in general very important by the respondents. In particular, shaping trustworthy relationships with customers, forming long-term relationships with customers, retaining competitive advantage, and increasing customers' satisfaction are regarded important or very important by the 98.8, 96.2, 94.3, and 93.1 percent of the respondents, respectively. On the other hand, only 45.2 percent of the respondents believe that having compatible information systems with customers is an important issue, despite the fact that compatibility of

	Not/little important (%)	Important/very important (%)
1. Shaping trustworthy relationships with customers	0.0	98.8
2. Assuring accurate transition of information to customers	0.0	91.3
3. Organization's assessment by customers	3.1	81.9
4. Using compatible information systems with customers	11.6	45.2
5. Forming long-term relationships with customers	0.6	96.2
6. Retaining competitive advantage	1.3	94.3
7. Increase of market share	1.3	91.6
8. Improving performance together with customers	11.5	73.7
9. Improving communication among organizational functions for customer service	13.8	86.1
10. Improving communication between company and customers	1.9	91.8
11. Increasing customers' satisfaction	0.6	93.1
12. Improving product/services quality	0.7	93.0

Table VII.
Importance of customer
related issues

information systems between organizations and customers can enhance customer service level. Furthermore, as far as costing is concerned, compatibility of information systems is a necessary condition to optimize costs across supply chains (Drucker, 1995). The second lowest percentage has been given to "improving performance working together with customers" (73.7 per cent)

In order to determine whether any of the variables regarding managers' attitudes are related to each other in a common category, factor analysis was performed on the set of questions presented in Table VII. The KMO measure for sampling adequacy was satisfactory at 0.825 and Bartlett's test of sphericity was 638.4 at 0.000 significance level. The factor loadings are presented in Table VIII. Factor analysis resulted in two factors; the first one included the improvement of communications inside the company and between

Factor 1: Customer satisfaction	
Increasing customers' satisfaction	0.855
Improving communication between company and customers	0.815
Improving product/services quality	0.793
Improving communication among organizational functions for customer service	0.684
Improving performance together with customers	0.560
Factor 2: Customer relationships	
Shaping trustworthy relationships with customers	0.791
Organization's assessment by customers	0.722
Forming long-term relationships with customers	0.720
Retaining competitive advantage	0.664
Assuring accurate transition of information to customers	0.578

Table VIII.
Factor analysis (rotated
component matrix)

the company and customers as well as increasing customer satisfaction and product quality. This factor was named "customer satisfaction" with a reliability of $a = 0.80$. The second one included the variables of forming relationships with customers and retaining the competitive advantage. This factor was named "customer relationships" and exhibited a reliability of $a = 0.76$. The two factors explained 58.29 percent of the total variance and can be used in future research as implementation variables. Questions 4 and 7 in Table VII did not load high enough in any of the two factors and, thus, they were excluded from further analysis.

Finally, the study examined the relationship between the type of information system used and the extent to which a customer satisfaction and/or complaint data recording system is used by organizations. By performing the ANOVA procedure between the types of information systems used and the customer satisfaction/complaints variables it was found that no statistically significant correlation existed between these variables.

Conclusions

It is believed that this exploratory study has made a significant contribution by proposing a CRM development stage model, identifying the extent to which Greek organizations employ customer-oriented KM instruments and use customer feedback data, i.e. customer satisfaction and complaint, and investigating the level of CRM employed and managers' attitudes towards CRM issues.

The proposed CRM model specifies the basic parameters of the various CRM development stages. It can assist researchers to concentrate their efforts on a specific research area having, at the same time, a global view of the development process. On the other hand it can assist companies to detect problematic areas in the existing customer-based information system and motivate them to improve it.

According to the findings of the survey, only about half of the organizations employ instruments to systematically carry out customer satisfaction research and other customer-related analysis, while the other half is not involved in relationships marketing and has not adopted any CRM philosophy. This suggests that Greek companies need primarily, to develop an organizational culture positively oriented to construction, employment and exploiting of customer-oriented KM instruments. Greek enterprises are also in the first stages of the CRM maturity according to the technological indicators incorporated in the model of CRM development presented previously in the paper. Only a very small number of those are using integrated specialized CRM and SCM software and, thus, can be characterized as belonging to the mature CRM stage. However, about 90 percent of the respondents evaluate most CRM issues as important or very important. This suggests that companies should address the issues of practically installing and managing customer information

systems at all levels of the organization as it seems that managers are convinced about the merits of CRM and they are willing to exploit the advantages offered by CRM information systems.

Despite the excitement surrounding ERP systems concerning their knowledge accumulation, analysis and sharing capabilities (Radding, 2000), it was found that no relation exists between the type of the transactional information system used and the extent to which customer satisfaction research is performed by the organizations. An implication of this finding is that the adoption of modern processing technology, although essential for building customer-oriented knowledge-based and CRM systems, does not necessarily lead to advanced customer-centric initiatives. This finding may also indicate that standard transactional and first generation ERP systems overlook the importance of the customer satisfaction/dissatisfaction issues and are characterized by a lack of analytical capabilities. The sample of the respondents that use CRM systems was too small to perform any meaningful statistical analysis on that issue and further research, probably qualitative, is needed. It is reminded that the survey took place in Greece and the findings needs to be further verified by using a different and larger sample.

Customer-centric knowledge management requires a positive attitude and a desire to extract value for the organization by managing customer relationships over time. The organization, in order to really manage customer relationships, has to primarily develop a culture, motivating employees at all levels towards learning and facilitating them in capturing, selecting, using, and sharing knowledge by providing the means and the technology required to do so. In light of the above, future research could be directed at examining how enterprises should implement and integrate CRM technologies into their IT architecture and how these technologies could be used efficiently and effectively by their internal users and decision makers.

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