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VIRTUAL CRM AND E-BUSINESS PERFORMANCE

ABSTRACT: Customer Relationship Management is becoming increasingly relevant in the corporate agendas and has been broadly studied by academic researchers. In the last few years and with the development of the digital economy, a new paradigm has emerged: virtual customer relationship management (virtual CRM). We have defined a conceptual framework to examine the relationship between the virtual CRM and e-business success among European companies. Survey data from a questionnaire was used to empirically assess our research model. Using structural equation modelling analysis, the results show that virtual CRM competence can improve e-business performance and that some CRM internal applications can improve virtual CRM competencies.

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SECTION I. INTRODUCTION

In the electronic commerce age, the challenge that companies face is managing competitive advantage through the development of strong relations with all stakeholders: employees, customers, and upstream/downstream providers and other partners (Boyle & Alwitt, 1996; Boyle, 2001). The advent of the Internet has created numerous opportunities for marketing professionals to enhance current marketing practices, including customer relationship management (CRM).

In last two decades organizations have begun to realise the importance of knowing their customers well, in order to create and maintain a special bond. Companies have found that a customer relationship management approach that treats customer related knowledge can create competitive advantages. Nevertheless, although marketing researchers and information systems investigators have studied customer relationship management, there is still no conceptual basis

necessary to develop the measures of CRM contribution in business success. When analysed, the on-line performance of the companies and the implications of CRM application, these weaknesses assume a major role.

This paper discusses the results of an exploratory survey conducted among a large sample of European companies. Using a structural equation analysis, we explore the relationship between e-business success and CRM initiatives, measured by the internal resources of the company, internal competencies in CRM and the success measures: sales volume, number of customers, sales area and quality of customer service.

This paper has five sections and is organized as follows. In section 1 is provided a brief background for this research. Section 2 presents the definition and benefits of CRM. Section 3 defines virtual CRM, its advantages and its differences from traditional CRM. A virtual CRM evaluation framework is developed in Section 4. In the last section we conclude our study, reiterate the major points and suggest avenues for further investigation.

SECTION 2. CUSTOMER RELATIONSHIP MANAGEMENT

As numerous studies have pointed out, communication and customer knowledge are the bases of a strong relationship (see, Håkansson 1982; Dwyer et al., 1987; Duncan & Moriarty, 1998; Borghini & Rinallo, 2003; Huhtinen & Virolainen, 2002) and allows firms' forging a long-term relationship with customers, which can be the key to stability and probability in an increasingly dynamic market.

There are two reasons for this special attention to consumers. First, loyal customers are far more profitable to a company (Page, Pitt & Berton, 1995; Reicheld, 1996), because they have a lower price-sensitivity and are less likely to be deal-prone switches. Secondly, the relationship is usually difficult to understand and emulate (Day, 1997), which makes it a potential source of competitive advantage.

The recognition of the importance of customer relationship management began to grow in the 1990s (Ling & Yen, 2001; Xu et al., 2002). In the quest to become customer-centric, organizations have invested in Information Technology (IT) solutions that allow them to manage their customer relations strategically. Customer Relationship Management (CRM) was the

solution found by many companies and has become a buzzword in contemporary marketing and information systems. The process of CRM was originated by the Gartner Group. CRM refers to the management of business interactions with customers. It has been widely studied by academics; however, there is no universally accepted definition of CRM, as Table 1 shows.

- Insert Table 1 -

Like many other business information systems implementations, CRM is strongly linked in the literature to a sales and marketing perspective. As stated by Kincaid (2003), Xu et al. (2002) and West (2001), CRM involves, besides IT, three major organizational areas: marketing, sales, and services and support. As stated by West (2001), CRM manages the life cycle of a customer relationship that crosses from marketing, to sales, to service and support. IT is use basically to support and maintain these three functional areas and the overall CRM process (Kincaid, 2003).

According to Chase (2001), about 90% of early adopters failed in the implementation of CRM applications. Ngai (2005) points out that organizations are still motivated to adopt CRM to create and manage the relationships with their customers more effectively, regardless of this unsuccessful past and independently of organizations' size.

So, in the last two decades the number of studies that described the stages of a successful implementation of CRM process have risen (Noyes, 2000; Sweiger, 2000; Dick, 2000; Bednarz, 2001; Murtha & Foley, 2001, Flanagan & Safdie 2002; Kim et al., 2002). The number and definition of these stages vary, but can be synthesizes as follows:

1. Definition of the objectives and planning the measures of follow up with respect to CRM
2. Implementation of customer-centric business strategies (Lee, 2000)
3. Establishment of several data collections moments and unification of information in to data warehouse, to achieve a global picture of customer relationship (Sweiger, 2000)
4. Adaptation of the IT solutions to the CRM process, instead of driving it (Lee, 2000)

A critical factor in the CRM's popularity as a business tool is its benefits (Kim et al., 2003; Scullin et al., 2002; Jutla et al., 2001; Stone et al., 1996). These can be summarized as increased customer retention and loyalty, more effective marketing, creation of value for the customer, customization of products and services, higher customer profitability, and higher quality products and services and cost reduction.

We can resume that the main objective of customer relationship management is to maximize the lifetime value of a client to the organization (Stone et al., 1996; Kalakota and Robison, 1999;

Shaw, 1999; Peppers et al., 1999; Brown, 2000; Peppard, 2000; Turban et al., 2000; Scullin et al., 2002; Kim et al., 2003; Wu and Wu, 2005). However, to achieve a successful implementation of the CRM there are several requirements that must be met, as shown in Table 2.

- Insert Table 2 -

In the last two decades, the Internet has showed its enormous potential as a tool for customer relationship management, revealing a new dimension that will be presented in the next section.

SECTION 3. THE VIRTUAL CUSTOMER RELATIONSHIP MANAGEMENT

The major challenge for companies in this new millennium is to abandon their product-centric focus to a customer-centric one (Kim et al. 2003; Kandell, 2000). As Stone et al. (1996) pointed out “acquiring new customers is more expensive than keeping them” so companies need to promote their relationship with their customers. The Internet is transforming the interface between organizations and their customers.

Teo and Pian (2003) suggest that, even with 95% of the major companies having a website, the Internet has not yet proven to be the magic solution that many organizations had believed it would be (Meall, 2002; Dubois & Vernet, 2001). However, as stated by Boyle and Alwitt (1999) and Boyle (2001) the empirical results point to an additional benefit in the relationship development gained by companies that operates over the Internet. Furthermore, Osmonbekov et al. (2002), Rao et al. (2003) and Leek et al. (2002) suggested that the Internet improves the communication process and consequently the establishment of relationships.

CRM accesses the new market spaces spread around the world through the World Wide Web (WWW). The Web allows companies to access top-notch capabilities and improve commercialization by shortening the product life cycle, and lowering costs (Choy et al., 2003). Thus, it improves competitiveness by giving the customer more choices during the buying decision process, improving the information performance through the use of new technologies, developing new business models, accessing new market spaces and also transforming the interface between stakeholders into a long-term relationship.

The Internet presents a highly informed, powerful and smart group of customers, a group that demands a more satisfying relationship with companies. In B2C (Business to Consumer) and

B2B (Business to Business) commerce there is a need for better customer relationship management (Kalota & Robinson, 1999; Wu & Wu, 2005).

In this context, online companies are embracing Customer Relationship Management as a major element of corporate strategy, because online technological applications allow the precise segmentation, profiling and targeting of customers, and the competitive pressures of the digital markets require a customer-centric corporate culture. However, the adoption of CRM systems by online organizations implies a complex restructuring of all organizational elements and processes, such as automating the back-office or revising the product and services (Pan & Lee, 2003).

Pardun and Lamb (1999) have claimed that the number of companies that collect information and creates databases with their customers profile is increasing. Nevertheless, this gathering of information cannot be by itself considered as a CRM system, but a step in the direction of virtual CRM (e-CRM).

There is still no commonly accepted definition of virtual CRM. Romano and Fjermestad (2003) defined it as a combination of hardware, software, processes, applications and management commitment. In contrast, Pan and Lee (2003) have claimed that e-CRM has the ability to capture, integrate and distribute data gained at an organizational website.

According to Chang et al. (2005) electronic customer relationship management emerged from the Internet and web technology facilities to implement CRM solutions, focusing on a customer-centric relationship. We consider e-CRM as an internet-based business strategy that integrates every area that touches the customer, such as marketing, sales and support services, throughout people, processes with major contributions from new electronic technology (Internet, email, chat rooms, e-forums). Table 3 presents the differences between customer relationship management and electronic customer relationship management.

- Insert Table 3 -

According to Hamid (2005) virtual CRM brings other potential benefits to firms such as: (i) reduces the cost of communicating with customers as customers' current information is readily available; (ii) customer enquiries can be resolved in less time, thus freeing employees for other productive work; (iii) reduces administrative and operational costs since the Internet is primarily about self-service oriented transactions whereby customers are empowered to self-configure products, track orders and make changes themselves; (iv) allows a more efficient workflow as a

result of the integration between virtual CRM applications with back-office systems such as production, finance and supply chains, thus delivering cost savings; (v) improves sales by means of better market segmentation leading to effective automated campaign management, e-mail marketing, among others, and thereby increases the profitability of firms; and (vi) improves the overall customers' interaction which in turn would lead to better service, improve customer satisfaction and loyalty and ultimately customer lifetime value.

In essence, virtual CRM is a technology and business tool that allows companies to acquire and retain their most profitable customers (Wu & Wu, 2005). Unlike the traditional CRM supports marketing sales and service through multi-channels (Pan & Lee, 2003; Payne & Frow, 2005) and is integrated with other IT management tools, such as enterprise resource planning (ERP). According to Hamid (2005) the adoption of e-CRM can improve a firm's operational efficiency and therefore its business performance.

SECTION 4: EVALUATION FRAMEWORK AND HYPOTHESES

Even though academic researchers and practitioners alike praise virtual CRM adoption (Khalifa & Shen, 2005), there is still a lack of empirical evidence of its effects on e-business success. There is no measure of e-business success derived from e-CRM application. There is undoubtedly a need to develop a better comprehension of virtual CRM and its impact.

Traditional financial and accounting methods of evaluation are not suitable in this case, because there are some intangible, indirect and even strategic benefits that need to be considered (Grembergen & Amelinckx, 2002).

Since virtual CRM is an IT application the literature in this subject may shed some light on the measurement of the success of these initiatives (Romano & Fjermestad, 2001). Yoon et al. (1995) suggested a framework based on five levels: business profitability, improved decision performance, level of system usage, perceived benefits and user satisfaction. Others frameworks have been presented (DeLone & McLean, 1992; Seddon, 1999; Reinartz & Kumar, 2000), most of them focusing on customer satisfaction process, but the specific interface between e-CRM and e-business has not been treated from the organizational point of view. So, our aim is to establish a measurement framework that contributes to minimizing this gap.

The research model, as shown in Figure 1, illustrates the relationship between e-CRM implementation and e-business success. This framework also identifies metrics that can be used to measure the impact of virtual CRM on business performance. Each perspective is evaluated according to the appropriate metrics. The proposed research model tests four hypotheses.

- Insert Figure 1 -

Defining suitable performance measurements is an issue that has been widely debated in the marketing literature. According to Bhargava et al. (1994) financial success is only one aspect of a firm's performance that can be considered as an indicator of its economic value (Hax & Wilde, 2001). With the establishment of online business, new models and measures of performance are needed (Amit & Zott, 2000; Hoque, 2000; Craig & Jutla, 2001). D'Souza and Williams (2000) advocate that effective performance measurement should reflect CRM contribution to the overall competitive position.

According to recent literature, CRM and virtual CRM are macro-process that have distinctive components (Reinartz et al., 2003). In this case, the e-CRM performance will be indirectly measured in this models through three dimensions: exchange of knowledge throughout an organization, commercial transactions customisation, and product innovation cycle. According to the literature, these components profoundly affect the way companies act in terms of CRM.

In terms of the e-business success measurement, there can be a distinction between economic and market-based performance (Kholi & Jaworski, 1990; Bharadwaj, Varadarajan & Fahy, 1993; Reinartz et al., 2003). The concept of corporate success in e-business in this research is divided in three dimensions (Amit & Zott, 2001): hard factors, soft factors and innovation.

The hard factors are indicators of economic performance, namely sales volume and number of customers. The second dimension refers to a company's improvement in customer relationships, measured in our model by the quality of customer service. The last dimension reflects the company's achievements in terms of its competitive position, given by the sub dimension sales area. Henceforth we consider:

H1: The higher e-CRM competencies and implementation, the higher companies' e-business performance on markets.

Reinartz et al. (2003) argue that several factors can influence e-CRM competencies and implementation. The flexible and interactive nature of the Internet allows the collection of a great

amount of data about online customers and their interactions. The traditional concept of CRM has evolved to become the strategic integration element that allows companies to gather the information about customers' needs (Anton & Hoeck, 2002). CRM processes are supported by information systems in order to handle vast amounts of customer data and guarantee efficient workflows, in order to return some benefits in terms of a company's performance. In this sense knowledge exchange congregates the flows of information inside and outside the organization among employees, suppliers and customers. Therefore, it's stated that:

H2: The higher knowledge exchange throughout organization, the higher companies' e-business performance on markets.

Kohli and Jaworski (1990) suggested that in this context the marketing functions assume a more active role in the organizational structure, establishing the interface between functional areas. This would allow better cross-functional work, especially in the innovation process (Sethi, Smith & Park, 2001). Thus we establish a third hypothesis considering the positive effect of improvement in products innovation to the e-business performance.

H3: The higher improvement in products innovation, the higher companies' e-business performance on markets.

In the same line of thinking we consider another hypothesis regarding the commercial transactions modifications effect on e-business performance.

H4: The higher commercial transactions modifications, the higher companies' e-business performance on markets.

SECTION 5: METHODOLOGY AND RESULTS

The data employed in the empirical research comes from e-Business W@tch annual survey (2003). This data was collected in a large survey about e-business in European enterprises.

Considering that this study primarily examines the status of adaptation of web base customer relationship management by companies, thus, the original sample was limited to firms having e-business activities and companies adopting CRM practices. So, our work sample with 9.192 cases constitutes a heterogeneous sample of companies in terms of industries, fields, size, business model and country. The data cover 25 European countries (Cyprus, Czech Republic, Estonia,

Hungary, Latvia, Lithuania, Malta, Poland, Slovakia, Slovenia, Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Netherlands, Portugal, Spain, Sweden, UK and Norway). Distribution of firm size, measured by the number of employees, shows that most are micro and small size firms (around 59%). The industry distribution of responding sample is approximately similar to the original sample. The two most heavily represented sectors in the sample are business services and tourism, with 11.6% and 11.5% respectively, closely followed by all the others, with the exception of the craft and trade sector that represents only about 6% of the sample. More information about the sample is presented in tables 1a, 1b and 1c of the appendix.

We tested our hypotheses through the implementation of a structural equation model (SEM), using the statistical software AMOS. Based on the conceptual framework three alternate estimations were run in order to achieved the best model. After global model fit has been assessed, the numerical results were evaluated in order to test their support of the research hypothesis. The numerical results can be obtained directly from the path coefficients of the structural model presented in Figure 2. We refer to standardized coefficients which account for scale effects and serve as indicators of the relative importance of the variables.

- Insert Figure 2 -

Several goodness-of-fit tests were conducted to access whether the empirical model could explain the observed data. The measures for global model fit included in Figure 2 suggest that our model fits the underlying data quite well. The four hypothesis paths were all statistically significant.

Our findings generally support the conceptual framework previously presented, even though some of the relationships found are weaker than expected. In relation to hypothesis 1, the results show that virtual CRM competencies explain 20 per cent of the variance in e-business success. Thus, this finding places empirical support to the concept that e-business performance can be improved by the investment in e-CRM systems.

Similarly, product innovation, commercial transactions and exchange knowledge explains 73%, 77% and 59% of the variance in the e-CRM competencies construct.

Although, adoption and implementation of virtual CRM is only one part of the equation and the e-business impact must also be measured. So, in the e-business construct, volume of sales, number of customers, sales area and quality of customer service contributes to the explanation of the variance respectively with 82%, 84%, 85% and 68%. The above significant relationships

provide empirical support to the theoretical views that state that e-business performance needs to be measured using economic and market-based criteria.

Additionally, knowledge exchange, product innovation and commercial transactions modifications were found to have a positive indirect and significant relationship with e-business performance, presenting respectively the following values 35%, 53% and 60%. So, with respect to H2, H3 and H4, the indirect effects achieved in the model support these hypotheses.

All the previous statements lead to the hypotheses testing results presented in the following table.

- Insert Table 4 -

SECTION 6: DISCUSSION AND CONCLUSIONS

As literature review showed there has been only a few works examining CRM contributions to e-business performance, assuming a corporate perspective. However, the majority of these works were confined to specific industries. The goal of the current study was therefore: (1) to determine whether the implementation of virtual CRM activities is positively linked to virtual CRM competencies and (2) to identify the nature of the relationship existing between virtual CRM implementation and e-business performance.

The results generated some interesting findings. First, the data support our conceptualization for the virtual CRM construct. Within virtual CRM elements, all have a positive impact on the maximization of e-CRM competencies and consequently implementation.

Secondly, the findings allow us to conclude that virtual CRM competencies have a positive impact on e-business performance. Thus, virtual CRM appear to pay back the initial investments made by the companies. Nonetheless, the size of the effect for this relationship was smaller than would be expected. This suggests that not all CRM base activities are determinant of business performance improvement, which is reinforced by the indirect effects achieved.

According to these results, the concept of e-CRM as an integrated e-business tool that allows a more profitable relation with customer is reinforced. So, managers should consider the use of e-CRM competencies to improve everyday e-business process. Namely, taking advantage of the benefits such as reducing communication and operational costs, improves sales and the overall customers' interaction pointed out by others researches.

This research produces some useful insights, leaving still a number of issues for future research. One of these issues is related to the possibility of extending the study in order to consider the impact of other elements of e-CRM, such as technological readiness and management support. Similarly, this study could be expanded by including a customer perspective on the benefits of e-CRM to organizations e-business performance.

REFERENCES

- Amit, R. and Zott, C. (2000). Value Drivers of E-commerce Business Models, Knowledge@ Wharton, available at: [http:// knowledge.wharton.upenn.edu/PDFs/978.pdf](http://knowledge.wharton.upenn.edu/PDFs/978.pdf)
- Amit, R. and Zott, C. (2001). Value Creation in E-Business, *Strategic Management Journal*, 22(6), pp.493-520.
- Anton, J. and Hoeck, M. (2002). e-Business Customer Service, The Anton Press, Santa Monica, CA,
- Bednarz, A. (2001). Twelve steps to CRM success, Network World, December 2001, available at <http://www.nwfusion.com/news/2001/1203apps.html>.
- Bharadwaj, S., Rajan, P. and Varadarajan, J. (1993). Sustainable Competitive Advantage in Service Industries: A Conceptual Model and Research Propositions, *Journal of Marketing*, 57 (4) (Oct.), pp. 83-99
- Bhargava, M., Dubelaar, C. and Ramaswami, S. (1994). Reconciling diverse measures of performance: a conceptual framework and test of a methodology, *Journal of Business Research*, 31, October/November, pp. 235.
- Borghini, S. and Rinallo, D. (2003). Communicating Competence in the Medical Diagnostic Industry, in *proceedings 19th IMP Conference*, Lugano.
- Bose, R. (2002). Customer relationship management: key components for IT success, *Industrial Management & Data Systems*, 102 (2), pp.89-97.
- Boyle, B. (2001). The Internet in industrial channels: its use in (and effects on) exchange relationships, *Journal of Business and Industrial Marketing*, 16 (6), pp. 452-69.
- Boyle, B. and Alwitt, L. (1999). Internet use within the U.S. plastics industry, *Industrial Marketing Management*, 28, pp. 327-341.
- Brown, S. (2000). Searching for effective CRM, *Enterprise Systems Journal*, 15 (8), pp.40-43.

- Chang, T., Liao, L. and Hsiao, W. (2005). An Empirical Study on the e-CRM Performance Influence Model for Service Sectors in Taiwan, *in proceedings 2005 IEEE International Conference on e-Technology, e-Commerce and e-Service (EEE'05)*, pp. 240-245.
- Chase, P. (2001). Why CRM implementation fail...and what to do about it, Scribe Software Corp., available at http://eai.ebizq.net/crm/chase_la.html.
- Choy, K., Fan, K. and, Lo, V. (2003). Development of an intelligent customer-supplier relationship management system: the application of case-based reasoning, *Industrial Management & Data Systems*, 103 (4), pp. 263-274.
- Craig, J. and Jutla, D. (2001). *e-business Readiness: A Customer-focused Framework*, Addison-Wesley, MA.
- Croteau, A. and Li, P. (2003). Critical Success Factors of CRM Technological Initiatives, *Canadian Journal of Administrative Sciences*, 20 (1), pp. 21-34.
- Day, G. (1997). *Maintaining the competitive edge: creating sustaining advantage in dynamic competitive environments*, in Wharton on Dynamic Competitive strategies, by George Day and David Reibstein, John Wiley: New York, pp.48-75.
- DeLone, W. and McLean, E. (1992). Information systems success: the quest for the dependent variable, *Information Systems Research*, 3(1), pp. 60-95.
- D'Souza, D. and Williams, F. (2000). Appropriateness of the stakeholder approach to measuring manufacturing performance, *Journal of Managerial Issues*, 12 (2), pp. 227-46.
- Dubois, P.-L. and Vermette, E. (2001). Contribution et pistes pour la recherche en e-marketing, *Recherche et Applications en Marketing*, 16 (3), 1-8.
- Duncan, T. e Moriarty, S. (1998). A communication-based marketing model for managing relationship, *Journal of Marketing*, 62, April, pp.1-13.
- Dwyer, F., Schurr, P. and Sejo, O. (1987). Developing buyer-seller relationship, *Journal of Marketing*, 51, April, pp.11-27.
- European Commission and e-Business W@tch (2003). *E-Business decision maker survey in European enterprises*, available at <http://www.ebusiness-watch.org/>.
- Fjermestad, J., and Romano, N. (2003). An integrative Implementation Framework for Electronic Customer Relationship Management: Revisiting the General Principles of Usability and Resistance, *in proceedings of the 36th Hawaii International Conference on Systems Sciences*, January, pp.1-9.

Flanagan, T. and Safdie, E. (2002). Building a Successful CRM Environment, *available at* <http://www.techguide.com>.

Grembergen, W. and Amelinckx, I. (2002). Measuring and Managing E-business Projects through the Balanced Scorecard, *in proceedings* of the 35th Hawaii International Conference on System Science, IEE Computer Society Press.

Håkansson, H. (1982). *International Marketing and purchasing of industrial goods: an interaction approach*, Chichester. UK: Wiley.

Hamid, H. (2005). E-CRM: Are we there yet?, *Journal of American Academy of Business*,

Hax, A. and Wilde, D. II (2001). The Delta model discovering new sources of profitability in a networked economy, *European Management Journal*, 9 (4), pp. 379-91.

Hoque, Z. and Mia, L. (2001). Market competition, computer-aided manufacturing and use of multiple performance measures: an empirical study, *British Accounting Review*, 33, pp. 23–45.

Huhtinen, H. and Virolainen, V. (2002). Studying networks management from the communication perspective- a literature review, *in proceedings* 18th IPM Conference, Dijon.

Jutla, D., Craig, J., and Bodorik, P. (2001). Enabling and Measuring Electronic Customer Relationship Management Readiness, *in proceedings* of the 34th Annual Hawaii International Conference on System Sciences, IEE Computer Society Press.

Kalakota, R. and Robinson, M. (1999). *Customer Relationship Management: Integrating Processes to Build Relationships*, *E-Business*, Addison-Wesley: London.

Kandell, J. (2000). CRM, ERM, one-to-one decoding relationship management theory and technology, *Trusts & Estates*, 139, pp. 49 – 53.

Khalifa, M.. and Shen, N. (2005). Effects of Electronic Customer Relationship Management on Customer Satisfaction: A Temporal Model, *in proceedings* of 38th Hawaii International Conference on System Sciences.

Kim, H., Lee, G. and Pan, S. (2002). Exploring the critical success factors for customer relationship management and electronic customer relationship management systems, *in proceedings* Twenty-Third International Conference on Information Systems.

Kim, J., Suh, E., and Hwang, H. (2003). A model for evaluating the effectiveness of CRM using the balance scorecard, *Journal of Interactive Marketing*, 17, pp.5-19.

- Kincaid, J. (2003). *Customer Relationship Management: Getting it Right!*, Prentice-Hall PTR, Upper Saddle River, NJ.
- Kohli, A. and Jaworski, B. (1990). Market orientation: the construct, research propositions and marketing management implications, *Journal of Marketing*, 54 pp.1-18.
- Koufaris, M., Kambil, A. and LaBarbera, P. (2001). Consumer behaviour in web based commerce: an empirical study, *International Journal of Electronic Commerce*, Winter 2001.
- Lee, D. (2000). Four steps to success with CRM, crmguru.com, November, available at <http://www.crmguru.com/content/features/lee02.html>.
- Leek, S., Turnbull, P. and Naude, P. (2002). How is information technology affecting business relationships? Results from a UK survey, *Industrial Marketing Management*, in press.
- Ling, R., Yen, D. (2001). Customer relationship management: an analysis framework and implementation strategies, *Journal of Computer Information Systems*, 41(3), pp.82-97.
- Meall, L. (2002). Business: SME's and e-commerce-bubbles, bullets, and business. *Accountancy*, 130 (1311), November, pp.1.
- Murtha, K. and Foley, J. (2001). CRM supplement: ten steps to CRM success, *DM Review*, November.
- Ngai, E. (2005). Customer relationship management research (1992-2002): an academic literature review and classification, *Marketing Intelligence & Planning*, 23 (6), pp. 582-605.
- Noyes, A. (2000). CRM in online retail: four steps to success on the web, *Unisys World Print*, July.
- O' Reilly, P. and Dunne, S. (2004). Measuring CRM performance: an exploratory case, *working paper* University College Cork, Ireland.
- Osmonbekov T., Bello D. and Gilliland D. (2002). Adoption of electronic commerce tools in business procurement: enhanced buying center structure and processes, *The Journal of Business and Industrial Marketing*, 17, (2-3), March, pp. 151-166.
- Page, M., Pitt, L. and Berton, P. (1995). *Analyzing and reducing customer defections*, Long Range Planning, Penrose, The theory of the growth of the firm, Blackwell: London, 20, pp.821-834.
- Payne, A. and Frow, P. (2005). A Strategic Framework for Customer Relationship Management, *Journal of Marketing*, 69 (4), pp. 167-176.
- Pan, S. and Lee, J. (2003). Using e-CRM for a unified view of the customer, *Communications of the ACM*, 46 (4), pp. 95-99.

- Pardun, C. and Lamb, L. (1999). Corporate websites in traditional print advertisements, *Internet Research*, 9 (2), pp.93-99.
- Parvatiyar, A. and Sheth, J. (2001). Customer relationship management: emerging practice, process, and discipline, *Journal of Economic & Social Research*, 3 (2), pp.1-34.
- Peppard, J. (2000). Customer Relationship Management in Financial Services, *European Management Journal*, 18 (3), pp. 312-327.
- Peppers, D., Rogers, M. and Dorf, B. (1999). Is your company ready for one-to-one marketing?, *Harvard Business Review*, 77 (1), pp.151-60.
- Porter, M. (2001). Strategy and Internet, *Harvard Business Review*, March, pp. 62-78.
- Rao, S. and Perry, C. (2003). Thinking about relationship marketing: Where are we now, *Journal of Business and Industrial Marketing*, 17 (7), pp. 598-614.
- Reicheld, F. (1996). *The loyalty effect*, Harvard Business School Press: Cambridge, MA.
- Reinartz, W. and Kumar, V. (2002), The mismanagement of customer loyalty, *Harvard Business Review*, 80 (7), pp.86-94.
- Reinartz, W., Kraft, M. and Hoyer, W. (2003). Measuring the customer relationship management construct and linking it to performance outcomes, *working paper series*, INSEAD, France.
- Romano, N. and Fjermestad, J. (2001). Electronic commerce customer relationship management: an assessment of research, *International Journal of Electronic Commerce*, 6 (2), pp.61-113.
- Romano, N. and Fjermestad, J. (2003). Electronic commerce customer relationship management: a research agenda, *Information Technology and Management*, 4, pp.233-58.
- Scullin, S., Allora, J., Lloyd, G and Fjermestad, J. (2002). Electronic customer relationship management: benefits, considerations, pitfalls and trends, *in proceedings of the IS One World Conference*, Nevada.
- Seddon, P., Staples, S., Patnayakuni, R. and Bowtell, M. (1999). Dimensions of Information Systems success, *Communications of the Association for Information Systems*, 2, pp.1-61.
- Sethi, R., Smith, D. and Park, C. (2001). Cross-functional product development teams, creativity and innovativeness of new consumer products, *Journal of Marketing Research*, 38, February, pp.73-86.
- Shaw, R. (1999). Measuring, managing and improving the performance of CRM, *Interactive Marketing*, 1 (1), pp.44-58.

- Stone, M., Woodcock, N. and Wilson, M. (1996). *Managing the change from marketing planning to customer relationship management*, Long Range Planning, 29 (5), pp.675-83.
- Sweiger, M. (2000). CRM vs eCRM vs eRM, *Enterprise Systems Journal*, 15(12), pp.18-54.
- Swift, R. (2001). *Accelerating Customer Relationships Using CRM and Relationship Technologies*, Prentice Hall PTR, Englewood Cliffs, NJ.
- Teo, T. and Pian, Y. (2003). A contingency perspective of Internet adoption and competitive advantage, *European Journal of Information Systems*.
- Turban, E., Lee, J., King, D. and Chung, H. (2000). *Electronic Commerce: A Managerial Perspective*, Upper Saddle River, New Jersey: Prentice-Hall.
- West, J. (2001). Customer relationship management and you, *IIE Solutions*, 33 (4), pp.34-7.
- Wu, I. and Wu, K. (2005). A hybrid technology acceptance approach for exploring e-CRM adoption in organizations, *Behaviour & Information Technology*, 24 (4), July, pp. 303-316.
- Xu, Y., Yen, D., Lin, B. and Chou, D. (2002). Adopting customer relationship management technology, *Industrial Management & Data Systems*, 102 (8/9), pp.442-52.
- Yoon, Y., Guimaraes, T. and O'Neal, Q. (1995). Exploring the factors associated with expert systems success, *MIS Quartely*, 19 (1), pp.83-106.

TABLES TO INSERT IN THE TEXT

Table 1 – *Some definitions of CRM*

Author/Year	Definition
Swift (2001)	“enterprise approach to understanding and influencing customer behaviour through meaningful communications in order to improve customer acquisition, customer retention, customer loyalty, and customer profitability”
Parvatiyar and Sheth (2001)	“a comprehensive strategy and process of acquiring, retaining, and partnering with selective customers to create superior value for the company and the customer”
Kincaid (2003)	“the strategic use of information, processes, technology, and people to manage the customer's relationship with your company (Marketing, Sales, Services, and Support) across the whole customer life cycle”
Kim et al. (2003)	“managerial efforts to manage business interactions with customers by combining business process and technologies that seek to understand a company's customers”
Fjermestad and Romano (2003)	“a very complex combination of technology, software, people and business processes”
Bose (2002)	“is an integration of technologies and business process used to satisfy the needs of a customer during any given interaction”
Croteau and Li (2003)	“is a concept that enables an organization to tailor specific products or services to each individual customer”

Table 2 - *Prerequisites for CRM Success*

Prerequisites for CRM Success	References
Organisational Culture	McDermott and Stock, 1999; Xia and Lee, 2000; Peppard, 2000; Kos et al, 2001; Ryals, 2001; Kalakota and Robinson, 1999
Risk Management Planning	Smith et al, 2001
Cross-Functional Integration/Re-Organisation	Peppard, 2001; Anderson et al, 1994; Markus, 2000; Kos, 2001; Elliott, 1997
Executive Sponsorship/Commitment	Fletcher and Wright, 1996; Wixom and Watson, 2001
Phased Implementation	Flanagan and Safdie 2002; Kim et al 2002

User Participation	Kim et al, 2002; Puschmann, 2001; Lin and Shao, 2000; Nelson and Kirkby, 2001
Training & Personnel Development	Hanaman, 1999; Swallow Group, 2000
Strategies to Promote Acceptance	Jiang et al, 2000; META Group, 1998

Source: Adapted from O' Reilly and Dunne (2004)

Table 3 – *Differences between CRM and Virtual CRM*

Dimension	CRM	Virtual CRM
Customer Data	Data warehouse <ul style="list-style-type: none"> - customer information - transaction history - products information 	Webhouse <ul style="list-style-type: none"> - customer information - transaction history - products information - click stream - contents information
Analysis of Customer Characteristics	Transaction analysis <ul style="list-style-type: none"> - customer profile - past transaction history 	Transaction analysis <ul style="list-style-type: none"> - customer profile - past transaction history Activity Analysis <ul style="list-style-type: none"> - exploratory activities
Customer Service	Target Marketing <ul style="list-style-type: none"> - static service - one-way service - time and space limits 	One-to-One Marketing <ul style="list-style-type: none"> - real time service - two-way service - at any time - from anywhere

Source: Adapted from Pan and Lee (2003)

Table 4 – Results of hypothesis test

Hypotheses	Content	Significant
H1	<i>The higher e-CRM competencies and implementation, the higher companies' e-business performance on markets.</i>	Yes
H2	<i>The higher knowledge exchange throughout organization, the higher companies' e-business performance on markets.</i>	Yes
H3	<i>The higher improvement in products innovation, the higher companies' e-business performance on markets.</i>	Yes
H4	<i>The higher commercial transactions modifications, the higher companies' e-business performance on markets.</i>	Yes

FIGURES TO INSERT IN THE TEXT

Figure 1 – Framework of Analysis

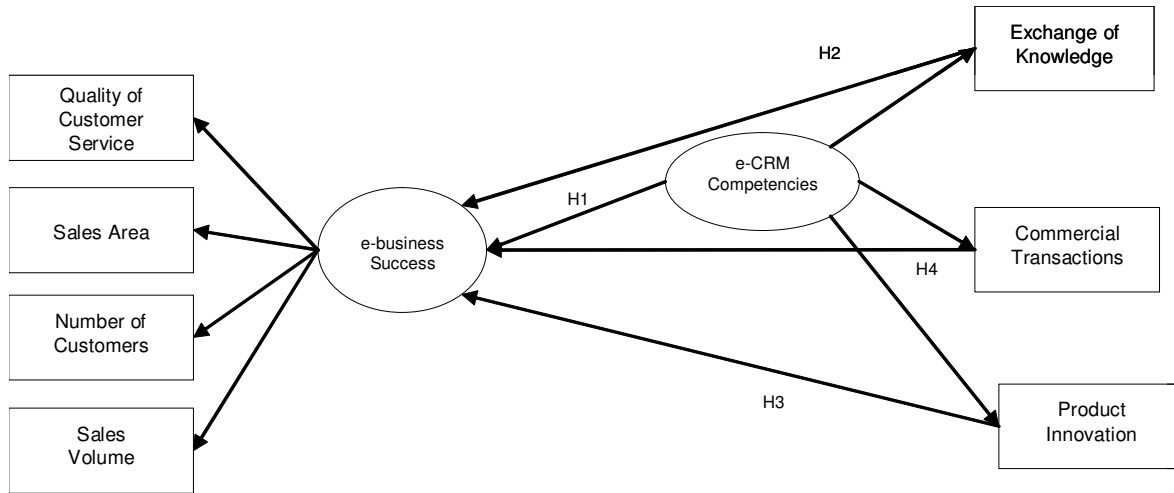
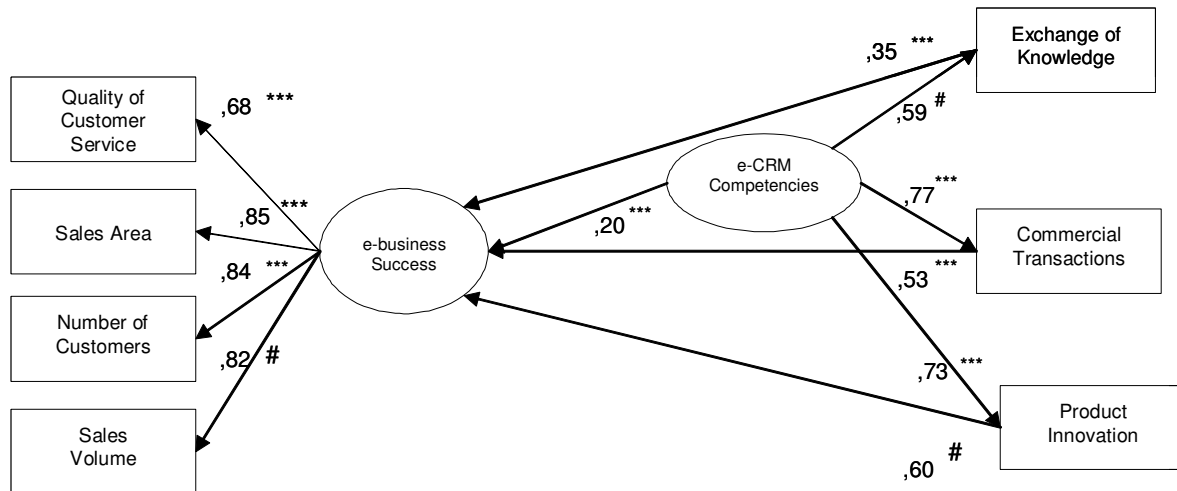


Figure 2 – Structural equation model and estimation results



Key for significance measures:

* : $\alpha > 0.10$
 ** : $\alpha > 0.05$
 *** : $\alpha > 0.01$
 # : for model identifiably, this path coefficient was set to 1 in the unstandardized

Measure	Value	Suggested
RMSEA	0.047	< 0.05
NFI	0.989	> 0.9
IFI	0.977	> 0.9
CFI	0.990	> 0.9

APPENDIX

Table 1a – Distribution of the sample by country

Country	Number enterprises	Country	Number enterprises
Cyprus	58	Denmark	190
Czech Republic	295	Finland	216
Estonia	466	France	785
Hungary	216	Germany	939
Latvia	90	UK	857
Lithuania	53	Greece	367
Malta	50	Ireland	202
Poland	644	Italy	903
Norway	97	Netherlands	290
Slovakia	157	Portugal	282
Slovenia	269	Spain	892
Austria	290	Sweden	306
Belgium	278		
Total			9192

Table 1b – Distribution of the sample by sector

Sector	Frequency	Percent
Textile, footwear and leather industries	815	8,87
Manufacture of chemicals and chemical products	912	9,92
Manufacture of electrical machinery and electronics	991	10,78
Manufacture of transport equipment	976	10,62
Crafts & Trade I	145	1,58
Retail	971	10,56
Tourism	1055	11,48
ICT services	978	10,64
Business services	1062	11,55
Health and social services	865	9,41
Crafts & Trade II	422	4,59
Total	9192	100

Table 1c– Distribution of the sample by companies' dimension

Country/Size	Micro	Small	Medium	Big	NA	Country/Size	Micro	Small	Medium	Big	NA
Cyprus	0	29	10	4	15	Finland	77	75	50	14	0
Czech Republic	89	80	95	31	0	France	370	262	136	17	0
Estonia	0	1	2	1	462	Germany	422	361	134	22	0
Hungary	99	44	52	18	3	Greece	132	134	71	30	0
Latvia	20	24	34	12	0	Ireland	53	51	35	10	53
Lithuania	10	10	12	2	19	Italy	183	63	8	583	66
Malta	16	13	16	4	1	Netherlands	133	92	54	11	0
Poland	190	183	206	65	0	Portugal	102	61	95	24	0
Slovakia	52	44	34	22	5	Spain	170	66	62	562	32
Slovenia	88	86	72	23	0	Sweden	105	84	93	24	0
Austria	96	99	72	20	3	UK	439	259	140	19	0
Belgium	97	94	50	15	22	Norway	36	40	16	5	0
Denmark	73	77	35	5	0						
% from the total							33,2%	25,4%	17,2%	16,8%	7,4%
Total							3052	2332	1584	1543	681